

ESENER 2024

Quality report

Final version (11.03.2025)

Table of Contents

1	Introduction	5
2	Accuracy	8
2.1	Coverage	8
2.1.1	Under-coverage in the sampling frame	8
2.1.2	Over-coverage	11
2.1.3	Misclassifications	11
2.2	Unit non-response	13
2.2.1	Difficulties in reaching sub-groups	13
2.2.2	Non-response related to survey subject	14
2.3	Item Non-Response	14
2.4	Sampling errors	18
2.4.1	Sampling errors resulting from the screening process	18
2.4.2	Sampling rates	20
2.4.3	The structure of the net sample	21
2.4.4	The magnitude of sampling errors in the full sample and in sub-samples	22
2.5	The questionnaire	23
2.6	Interviewer effects	24
2.7	Respondent effects	25
2.8	The data collection method	27
2.9	Data processing	29
2.10	Weighting	30
3	Relevance	31
3.1	Comprehensive coverage and dissemination	31
3.2	Alignment with EU-OSHA's objectives	32
3.3	Adaptation to current developments	32
3.4	Expert involvement	32
3.5	Cognitive testing	33
4	Coherence and comparability	34
5	Timeliness and punctuality	36
6	Accessibility	38
7	Respondent burden	40
8	Data protection	41
9	Conclusion	42
10	ESENER 2024 Quality control plan	43
11	Annex	63
11.1	Multi-variate logit regression model Q250	63

11.2 Multi-variate logit regression model Q355_1	67
11.3 Multi-variate logit regression model Q355_3	71
11.4 Multi-variate logit regression model Q314	75
11.5 Multi-variate logit regression model Q159	79
11.6 Multi-variate logit regression model Q202_4	82
11.8 Multi-variate logit regression model Q357	87

Figures and tables

Figure 1: Visual representation of the Total Survey Error paradigm.....	5
Table 1: ESENER 2024 Sampling Frame: Comparison with 2019 and Coverage Assessment.....	9
Table 2: Share of item non-response per question (unweighted results)	15
Table 3: Sampling rates, by country	20
Table 4: Standard error and confidence interval at different levels of disaggregation	22
Table 5: Weighted proportion of respondents per function answering “Yes” on question Q250	26
Table 6: Mode effect regression model	27
Table 7: Weighted proportion of respondents answering “Yes” on the selected OSH questions	28
Table 8: Respondent burden in terms of interviewing time, by country	40
Table 9: ESENER 2024 Quality control plan.....	43
Table 10: Mode effect regression model Q250 « Risk Assessment conducted ».....	64
Table 11: Mode effect regression model Q355_1 « Employee training on the use of working equipment »	68
Table 12: Mode effect regression model Q335_3 « Providing employees with training on how to prevent psychosocial risks such as stress or bullying »	72
Table 13: Mode effect regression model Q314 « Impact of digital technologies on OSH have been consulted on with employees »	76
Table 14: Mode effect regression model Q159 « Sickness absence increased over the last 3 years»	80
Table 15: Mode effect regression model Q202_4 « Provision of ergonomic equipment»	84
Table 16: Mode effect regression model Q357 « Occasional or regular discussions of health and safety in staff or team meetings »	88

1 Introduction

ESENER is an ongoing Europe-wide survey about workplace health and safety management practices. It is the only EU-level information source on how occupational safety and health (OSH) is managed in workplaces, both public and private.

First run in 2009, ESENER involved nearly 36,000 interviews with managers and OSH representatives in all EU Member States¹ in addition to Turkey, Norway and Switzerland and covered private and public sector establishments with 10 or more employees. In 2014, the second round of ESENER provided an even more detailed look at workplace risks in the EU (and the other surveyed countries), with a new questionnaire and a single respondent per workplace, the person who knows best about OSH at the establishment. The survey collected insights from almost 50,000 establishments across 36 countries covering private and public sector establishments with at least five employees. Workplaces in agriculture, forestry and fishing were included too. Run in 2019 for the third time, ESENER followed the methodological approach of ESENER 2014, completing more than 45,000 surveys in all EU Member States at the time (including Croatia and the United Kingdom), in addition to Norway, Switzerland, Iceland, North Macedonia, and Serbia, and covered private and public sector establishments with five or more employees. Questions on digitalisation were included for the first time.

The fourth round of ESENER, ESENER 2024, built further on the previous waves of this survey with a central aim of collecting robust current evidence from across Europe while providing the capability for rigorous analysis of trend data over time. While the requirement to be able to make like-for-like trend comparisons with previous data placed an emphasis on consistency of methodology and survey questionnaire, it was equally important to ensure the survey remained current, reflecting the latest issues relating to safety and health practices in the workplace.

The survey was conducted as a telephone survey using the CATI technology (CATI = Computer Assisted Telephone Interviewing), although there was also a small number of interviews that were conducted as CAWI interviews (CAWI = Computer Assisted Web Interviewing) by respondents who refused to take part in the telephone interview but were willing to complete the online version of the survey.

In all countries, the same methodology was applied. All national language versions of the survey questionnaire were strictly harmonized, thus allowing for full comparability of survey results between countries. Ipsos coordinated the data collection in all 30 countries on behalf of EU-OSHA using the same data collection software across all countries, including central purchase and release of samples. Further methodological details can be found in the Technical Report.

The quality framework adopted for ESENER 2024 was informed by the Guidelines for Best Practice in Cross-Cultural Surveys (Survey Research Centre at the University of Michigan, 2016)² and combined the Total Survey Error (TSE) paradigm³ with the user-oriented perspective of the European Statistical System (ESS) framework (Eurostat Luxembourg, 2009)⁴.

The following elements in the overarching quality assurance plan were in place:

- A Quality control plan integrating Key Performance Indicators (KPIs) for both the Total Survey Error (TSE) paradigm and the European Statistical System (ESS) framework;
- A detailed timeline including all steps and milestones;
- Field progress monitoring tool;

¹ All current EU Member states were included – Croatia too, even though it was still a candidate country in 2009. The United Kingdom has been included in ESENER 2009, 2014 and 2019.

² https://ccsg.isr.umich.edu/wp-content/uploads/2019/06/CCSG_Full_Guidelines_2016_Version.pdf

³ Total Survey Error: A Paradigm for Survey Methodology, Lars E. Lyberg and Herbert F. Weisberg, in *The SAGE Handbook of Survey Methodology* (2016)

⁴ Version 2009 : https://unstats.un.org/unsd/dnss/docs-ngaf/eurostat-esqr_final.pdf

Version 2019 : <https://ec.europa.eu/eurostat/documents/64157/4392716/ESS-QAF-V1-2final.pdf/bbf5970c-1adf-46c8-afc3-58ce177a0646>

- Data quality control checks during and upon the end of the fieldwork;
- Data protection measures.

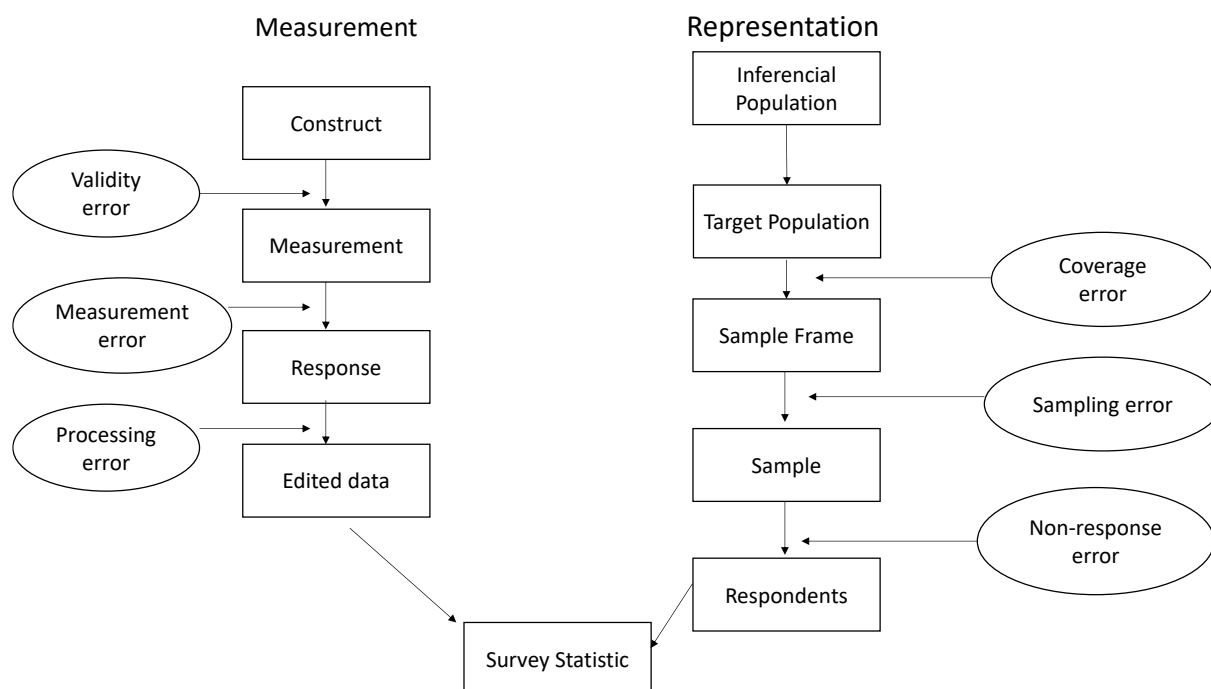
This report presents the outcomes for ESENER 2024 according to the quality control plan key performance indicators as well as the project timeline compared to the initial planning.

The quality report is not the only document related to the methodology of ESENER 2024. In addition, the following reports are available⁵:

- Technical Report, documenting the sampling and other methodological issues, fieldwork organisation, fieldwork outcomes and further information relevant for users of the ESENER 2024 dataset.
- Translation Report, documenting the process of the elaboration of national questionnaire versions in detail.
- Cognitive Testing Report, documenting the questionnaire, fieldwork and findings of the face-to-face cognitive pre-test carried out as the first empirical test step for ESENER 2024.
- Pilot Report, documenting the set-up and outcomes of the CATI pilot interviewing done as the last stage in the testing of the survey instrument in all 30 countries.

The TSE paradigm is widely accepted as a conceptual framework for evaluating survey data quality. TSE refers to the accumulation of all errors that may arise in the design, collection, processing, and analysis of survey data and takes into consideration both measurement (construct validity, measurement error and processing error), as well as representation (coverage error, sampling error, non-response error and adjustment error) (Groves et al., 2009)⁶.

Figure 1: Visual representation of the Total Survey Error paradigm



⁵ www.esener.eu

⁶ Groves, R. M., Fowler, F. J. Jr., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009a). Survey methodology (2nd ed.). Hoboken, NJ: John Wiley & Sons

While the TSE framework is a landmark development in the approach to survey quality and has had a tremendously positive impact on the quality of survey organisation and output, Biemer and Lyberg (2003)⁷ have argued that the TSE framework can benefit from adding a user perspective, and that it should be supplemented by a quality paradigm that is multidimensional and focuses on criteria for assessing quality in terms of the degree to which survey data meet user requirements (fitness for intended use). This user-centric perspective is the basis for the European Statistical System framework, which lists five dimensions to assess the quality of survey data in terms of both survey error and fitness for use: accuracy; relevance; coherence and comparability; timeliness and punctuality and accessibility and clarity. In this framework, TSE may be viewed as being encompassed by the accuracy dimension.

Both quality assurance and control activities were formalised in **a quality control plan** for ESENER 2024. This plan listed for each task:

- the quality actions taken,
- a quality target that was aimed to be reached,
- how this target would be measured,
- how the implementation and the outcome of the quality action would be documented,
- who was responsible for this quality action,
- how the action fitted within the ESS framework and its dimensions, and
- how the action related to the TSE framework elements.

Chapter 2 to 8 provide a short summary of the assessment of ESENER 2024 according to each of the main above-mentioned dimensions of the ESS framework.

Chapter 10 concludes with ESENER 2024 Quality Control Plan that was used throughout the project to monitor quality performance according to the set performance indicators and which includes an update on the quality actions taken and their outcomes.

⁷ Biemer, P. P., & Lyberg, L. E. (2003). Introduction to survey quality. Hoboken, NJ: John Wiley & Sons

2 Accuracy

Accuracy: “The accuracy of statistical outputs in the general statistical sense is the degree of closeness of estimates to the true values”⁸.

Random probability surveys, by their nature, provide an estimate of the situation under study. They aim to draw conclusions about an entire population based on observations from a subset of units. The accuracy of such surveys is influenced by various factors.

This chapter will examine the primary potential sources of error inherent in probability sample surveys and assess their impact on ESENER 2024.

1. **Errors of non-observation:** These occur when the entire target population is not observed. This category includes:

- Coverage or frame errors
- Non-response
 - Unit non-response
 - Item non-response
- Sampling errors (resulting from the selection of only a subset of the population)

2. **Measurement errors:** These arise during the data collection process and can be attributed to:

- Questionnaire design
- Interviewer influence
- Respondent behaviour
- Data collection mode

3. **Processing errors:** These can be further divided into:

- Errors in data coding, editing, and processing
- Errors in weighting procedures

Examining these potential sources of error allows for a better understanding of the accuracy and reliability of the ESENER 2024 survey results.

2.1 Coverage

Coverage error occurs when not all members of the defined survey population have the same chance of being included in the sample.

2.1.1 Under-coverage in the sampling frame

Incomplete coverage is arguably the most significant frame error in organisational surveys, primarily resulting from incomplete address sources.

For ESENER, the most comprehensive establishment-level sampling frames available were selected. Many of these are address registers compiled by private organisations, as national statistical offices often lack establishment-level registers or restrict access for survey use. Consequently, several registers used in this survey are not based on mandatory registrations of all organisations. Instead, they are compiled from various public sources such as trade and tax registers, sometimes supplemented by the frame provider's own investigations or address verifications.

⁸ European Statistical System (ESS) framework (Eurostat Luxembourg, 2009): https://unstats.un.org/unsd/dnss/docs-nqaf/eurostat-esqr_final.pdf
Version 2019: <https://ec.europa.eu/eurostat/documents/64157/4392716/ESS-QAF-V1-2final.pdf/bbf5970c-1adf-46c8-afc3-58ce177a0646>

In these sources, certain types of organisations tend to be more thoroughly represented than others. For instance, large commercial entities are typically well-documented, while smaller units and public or non-profit organisations often have less complete entries.

When this type of under-coverage, stemming from incomplete entries in address registers, is limited to specific size classes or sectors of activity, it can largely be mitigated through two approaches: the weighting procedure, which minimises its impact on survey quality, or by complementing the existing frame with additional sources for the specific size classes or sectors of activity affected.

However, under-coverage due to factors not clearly linked to size or sector is challenging to identify. There is a lack of reference statistics showing the actual distribution of the universe beyond establishment size and sector. For example, reliable and sufficiently detailed statistical data on ownership types by sector, detailing the proportion of public, private, non-profit and mixed entities or family-owned businesses, tend to be absent. This absence of data prevents corrections via additional frames or post-hoc weighting.

The Technical Report describes how the ESENER 2019 sampling frame sources were evaluated to ensure maximum comparability with ESENER 2024. Where coverage could be improved by using an establishment sampling frame instead of a company frame, or where higher coverage could be obtained by using a new sampling source, a switch in sample source was considered. Access to the 2019 sample frame was also considered, given that some sample sources no longer existed in full or had changed form, for example, containing less data. Any changes in sampling frame source were discussed with EU-OSHA prior to implementation. Section 4.2 of the Technical Report provides additional information on the decisions made for each country. Table 1: below offers an overview of the total coverage of the selected sampling frame per country and indicates whether the same frame was used as in the previous round.

Table 1: ESENER 2024 Sampling Frame: Comparison with 2019 and Coverage Assessment

Country	Coverage assessment	Sampling frame 2024
Austria	High coverage (95%), lower for public sector	Switch from Establishment in ESENER 2019 to Company sample source
Belgium	Good: 86%, lower for NACE ⁹ O (public administration)	Establishment sample source identical to ESENER 2019
Bulgaria	Good: 88%, lower for NACE O & P (public administration and education)	Company sample source identical to ESENER 2019
Croatia	High: 94%	Company sample source identical to ESENER 2019
Cyprus	Good: 68%, given comparing sources at different levels	Company sample source identical to ESENER 2019
Czechia	High: 94%	Switch to new Company sample source
Denmark	High: 98%	Switch to new Establishment sample source
Estonia	High: 108%	Company sample source identical to ESENER 2019
Finland	High: 98%	Switch to new Establishment sample source

⁹ NACE: Statistical classification of Economic Activities

ESENER 2024 Quality report

Country	Coverage assessment	Sampling frame 2024
France	Good: 84%	Establishment sample source identical to ESENER 2019
Germany	Good: 79%	Establishment sample source identical to ESENER 2019
Greece	Poor: 27% (ESENER 2019 same low coverage)	Switch to new Company sample source
Hungary	High: 92%	Company sample source identical to ESENER 2019
Ireland	Good: 81%	Establishment sample source identical to ESENER 2019
Italy	High: 100%, low NACE P (education)	Switch from Establishment in ESENER 2019 to Company sample source (whilst sample source is identical)
Latvia	Good: 84%, low public sector	Switch to new Company sample source
Lithuania	Good: 88%	Company sample source identical to ESENER 2019
Luxembourg	Fair: 65%, coverage higher than ESENER 2019	Establishment sample source identical to ESENER 2019
Malta	Good after enrichment: 84%, including cases without size	Company sample source identical to ESENER 2019
Netherlands	High: 107%	Switch to new Establishment sample source
Poland	High (113%) and better than ESENER 2019 (circa 77%)	Switch from Establishment in ESENER 2019 to Company sample source
Portugal	High: 82%, given comparing sources at different levels	Company sample source identical to ESENER 2019
Romania	Good: 74%, given comparing sources at different levels	Company sample source identical to ESENER 2019
Slovakia	High: 107%	Company sample source identical to ESENER 2019
Slovenia	Good: 74%, given comparing sources at different levels	Company sample source identical to ESENER 2019
Spain	Good: 83%	Switch to new Establishment sample source
Sweden	Fair: 73% (same coverage as ESENER 2019)	Establishment sample source identical to ESENER 2019
Iceland	Fair: 60% (same coverage as ESENER 2019)	Company sample source identical to ESENER 2019
Norway	High: 104%	Establishment sample source identical to ESENER 2019
Switzerland	Perfect (frame and population same source)	Establishment sample source identical to ESENER 2019

2.1.2 Over-coverage

In ESENER 2024, multiple listings of establishments, a form of over-coverage, were generally not a significant concern. The nature of the survey, which targets within each establishment a specific respondent who "knows best about health and safety in the establishment", naturally mitigates this issue. If a sampling frame contained duplicate listings, this would typically become apparent during the contact phase.

The length and specificity of the ESENER interview make it memorable for respondents, reducing the likelihood of unintentional repetition. While there might be rare instances where different target persons were identified within the same organisation, these cases were considered exceptional.

To address potential double interviewing, the response code 17 "Already questioned (double address)" was implemented. Analysis of the gross data reveals that this code was used in only 0.1% of all contacted addresses (n = 409 cases). As in ESENER 2019, Luxembourg reported the highest share of "duplicates", though this decreased from 4.8% in 2019 to 1.4% in 2024. This higher rate in Luxembourg may be attributed to their use of an establishment-level sampling frame based on the national Yellow Pages telephone register, where double listings tend to occur more frequently, particularly for organisations active in different sectors.

It is worth noting that not all cases coded as "Already questioned" necessarily represented duplicate listings in the sampling frame. This code was also applied when subsidiaries of multi-site organisations redirected interview requests to their headquarters, which may have already participated or declined further requests due to previous contact.

The low incidence of double addresses across most countries underscores the overall quality of the sampling frames used. This, combined with the implemented safeguards, ensures that over-coverage due to multiple listings had minimal impact on the ESENER 2024 results.

2.1.3 Misclassifications

Misclassifications caused by incorrect information in the sampling frame units can occur in each element of the definition of the target population. During fieldwork, the quality of the sample was continually assessed by examining the proportion of household numbers, non-working numbers, and establishments with fewer than 5 employees across contacted establishments. Additionally, mismatches between the establishment size and sector in the sample and those reported by the establishment during the survey were monitored.

To improve sample quality, additional phone number lookups were conducted during fieldwork for open target cells, aiming to replace non-working numbers with active ones. This phone number lookup was performed twice: first, after approximately one month in the field, and second, a month before field closure. More details on the phone number lookup process and its success rate can be found in section 4.2.3 of the Technical Report.

In some countries – Estonia, Latvia, Lithuania, Finland, Norway, Poland, and Denmark – the phone number lookup was extended to include numbers that repeatedly resulted in "busy" or "no answer" responses. This approach, in addition to addressing wrong numbers, was implemented to maximise coverage.

The final number of households contacted, non-working numbers, and establishments with fewer than 5 employees can be found in Table 25 of the Technical Report.

Regarding the mismatches between the establishment size and sector in the sample and the survey responses (referred to as stratum jumpers), and those reported by the establishment during the survey as having fewer than 5 employees, as detailed in sections 4.5 and 6.5.1 of the Technical Report, these discrepancies inevitably affected sampling and field efficiency, as well as eligibility, response, and cooperation rates.

▪ Size misclassification

It is important to recognise that an organisation's workforce size is subject to change over time. Even with regular register updates, the employee count listed in the address register may have changed since the last update. To address this, one of the survey's initial questions (Q102) asked for the current number of employees. If an establishment was found to have fewer than 5 employees at the time of the interview, the interview was terminated at that point.

The employee count provided in Q102 was used as the basis for size classification, superseding the initial information from the sample frame. This updated size indication was used for all subsequent steps, from question filtering to sample distribution monitoring and data weighting.

This real-time adjustment to size misclassifications ensures that the collected data accurately reflects the establishment size as reported by the respondent. In total, 6.7% of the contacted addresses were screened out due to incorrect size indications in the sampling frame (3.4% when excluding Poland). Additionally, 29% of the completed interviews belonged to a different size class than indicated in the sampling frame, which is a slight increase from the 24% of size jumpers reported in ESENER 2019. Further details can be found in Table 25 and Table 14 of the Technical Report, respectively.

In countries using company-level frames, discrepancies between the indicated size class and the size information provided in the interview are expected for multi-site organisations. While the address register lists the total number of employees in the entire company (including subsidiaries), the interview is conducted with just one local unit (establishment), with Q102 specifically referring to that selected unit's employee count. This establishment may well fall into a smaller size class than the entire company.

For countries using establishment-level sampling frames, the employee size listed in the frame and that of the establishment questioned for the survey is typically the same, even for establishments from multi-site organisations.

However, in several countries, more than 40% of the completed interviews showed a discrepancy between the size class according to the survey data and that indicated in the sampling frame (see Table 14 of the Technical Report). This high level of size jumping was observed in:

- Malta, Cyprus, and Poland (using company frame registers);
- Luxembourg, the Netherlands, Ireland, and Belgium (using establishment frame registers).

Size jumping was most prominent from the 5-9 employee category to the 10-49 employee category. The reverse transition was the second most common occurrence overall, and was the predominant form of stratum jumping in Estonia, Italy, Sweden, and Norway.

In countries where many addresses fall out of the universe due to having fewer than 5 employees, it is reasonable to assume that among the addresses with fewer than 5 employees excluded ex ante for the survey, there would also be a notable number of establishments that actually have 5 or more employees at the time of interview, based on the employee definition from Q102. To optimise coverage of establishments just above the 5-employee threshold, consideration could be given to sampling establishments with fewer than 5 employees according to the sampling frame information in countries where such inaccuracies frequently occur. However, this approach would be costly, as many addresses with a size indication of 1-4 employees in the sampling frame would not be usable because they actually have fewer than 5 employees in reality (at the time of the interview).

This approach to handling size misclassifications ensures that the ESENER 2024 data accurately reflects the current state of establishments, even when it differs from the initial sampling frame information. It allows for a more precise representation of the target population, though it does introduce some challenges in terms of sampling efficiency and resource allocation.

The high rate of misclassifications underscores the importance of real-time verification of establishment characteristics during the survey process. It also highlights the dynamic nature of the business landscape, where establishment sizes can change rapidly, making it challenging to maintain completely accurate sampling frames.

▪ Sector misclassification

Establishments were asked via question Q108 at the beginning of the survey to confirm the sector attribution from the sampling frame. If not confirmed, establishments were asked to describe their establishment's sector of activity. The interviewer would immediately allocate the sector to the corresponding NACE 2-level code in Q109 and confirm with the establishment if the selected code matched the described sector. In cases where the relevant code could not be found, the interviewer would record the sector description as a text (verbatim response). These verbatim responses were subsequently coded into NACE Rev.2 categories by the central research team.

The sector provided in Q109 was used as the basis for sector classification, superseding the initial information from the sample frame. This updated sector indication was used for all subsequent steps, from question filtering to sample distribution monitoring and data weighting.

Overall, 8% of establishments considered the sector indication from the frame source to be incorrect, compared to 10% in ESENER 2019. Country results varied considerably, ranging from 2% sector jumpers in Croatia to 16% in both Austria and Poland (see Table 14 of the Technical Report).

▪ Unit-level misclassification

Unit-level misclassification relates to the potential erroneous categorisation of addresses as "establishments" or "local units". An "establishment" is principally defined as "an enterprise or part of an enterprise situated in a single location, where only a single productive activity is carried out or where the principal productive activity accounts for most of the value added".

However, establishment registers often employ varying logic and definitions when distinguishing "local units" or "establishments" from larger entities like "companies" or "enterprises", or from smaller units such as "departments". For instance, larger enterprises frequently divide their operations into various legally independent units, often co-located and performing similar functions. These units may be classified differently across registers – as local units in some, as companies in others (due to their legal independence) – or not listed separately at all but considered part of the larger organisation at that location.

To address these classification challenges in countries using company-level sampling frames, a consistent screener question was applied across all companies, as spelled out in questions Q050 to Q055.

2.2 Unit non-response

While the eligibility, response, and cooperation rates provide valuable insights into unit non-response (as detailed in section 6.5 of the Technical Report, which breaks down these rates by country, sector, and size), they are not the sole indicators of non-response errors. Equally crucial is the avoidance of response bias, or selective unit non-response, where specific sub-groups of the target population systematically participate at lower rates than others. For ESENER 2024, the most likely causes for selective non-response are:

- Difficulties in reaching certain sub-groups of the frame population;
- Non-response related to the survey subject.

2.2.1 Difficulties in reaching sub-groups

ESENER 2024 sampling and weighting design automatically corrects for selective non-response related to establishment size and sector, provided the selectivity is confined to the predefined sampling matrix. When addresses for a particular cell were exhausted, new addresses were provided for that specific cell, effectively replacing non-responding establishments with others of the same sector and size-class.

The weighting process further addressed this issue by applying the same 76-cell matrix (4 size-classes and 19 NACE sections) in all countries (see details in section 7.4 of the Technical Report). This process

equalises unequal non-responses within different cells of the sampling and weighting matrix, provided sufficient interviews are available for the concerned sectors.

Fieldwork feedback suggests certain sub-group patterns of selective non-response. For instance, retail trade subsidiaries or bank branches were often not authorised to participate and were told to either refuse or to direct the interview to the headquarters, while some other small Public Administration units sometimes felt unqualified to respond. This selective non-response may lead to an over-representation of single-site units and headquarters in these sectors. The extent of this bias is difficult to quantify as most establishment-level address sources lack information on an address' status as headquarters or subsidiary.

2.2.2 Non-response related to survey subject

Given ESENER 2024 focus on "good practice" employer behaviours and legal obligations, some degree of subject-related non-response is anticipated. Measures were taken to encourage participation from all types of employers, regardless of their Occupational Safety and Health (OSH) performance. These included careful formulation of the survey introduction, the option to share a detailed motivation letter, specific interviewer instructions, and assurance of both confidentiality and anonymity.

Following the ESENER 2024 pilot survey, a modification was made to the text in the motivation letter, emphasising the importance of participation from smaller establishments. This adjustment aimed to ensure a more balanced representation across establishment sizes.

It is worth noting that the survey results themselves provide evidence that participation was not limited to high performers or those that highly value OSH management. For instance, questions about practices that are legally mandated, such as maintaining records of employee sickness, did not show 100% compliance. This suggests that the survey captured a range of OSH performance levels, not just exemplary ones.

The pilot questionnaire for ESENER 2024 also incorporated a limited series of questions intended for individuals or establishments declining to participate in the survey. These non-response questions were designed to assess whether and to what extent the OSH culture in participating establishments differed from that of non-participants, mitigating the risk that, given the voluntary nature of the survey, better-performing establishments would be more willing to participate. However, due to the low response rate of 16% among those who received these questions, it was decided to remove the non-response questions from the main field questionnaire.

2.3 Item Non-Response

A high proportion of item non-response for a particular question may indicate that it was frequently misunderstood, or that respondents, while comprehending the question, were unable or unwilling to provide an answer.

In ESENER 2024, the overall item non-response rate remained low at 1.3% per interview (including national boost questions). This means that, on average, respondents did not answer 1.3% of the questions they received.

Table 2: below illustrates the range of item non-response rates for individual questions, spanning from 0% to 5.8%. Question Q159, "Has absence due to sickness rather increased, rather decreased or stayed about the same over the last 3 years?", had the highest item non-response rate at 5.8%, mirroring its status in ESENER 2019. The top five questions with the highest item non-response rates were:

1. Q159 "Has absence due to sickness rather increased, rather decreased or stayed about the same over the last 3 years?" (5.8%)
2. Q256 "In what year was the last workplace risk assessment carried out?" (4.3%)
3. Q309 "You pointed out that your establishment carries out risk assessments. Do you have sufficient information on how to include psychosocial risks in risk assessments?" (3.5%)

Q154 "Has your establishment been visited by the labour inspectorate in the last 3 years to check health and safety conditions?" (3.5%)

4. Q307 "Considering the situation in your establishment: Are psychosocial risks easier or more difficult to address than other risks or is there no big difference?" (3.0%)

Q202_5 "Has your establishment in the last 3 years taken any of the following measures? The possibility for people with health problems to reduce working hours" (3.0%)

5. Q102 "How many employees are currently on the payroll of this establishment?" reported 2.9% item non-response. This was mitigated by presenting Q102a, which offered a list of employee size categories for respondents who initially answered "don't know" to Q102.

Comparing data collection modes, CAWI (Computer-Assisted Web Interviewing) interviews showed an even lower item non-response rate (0.5%) than CATI (Computer-Assisted Telephone Interviewing) interviews (1.3%). This suggests that the questionnaire was generally easy to answer across both modes.

It is important to note that item non-response was not considered in isolation. As detailed in Section 7.2 of the Technical Report, it was evaluated alongside other quality indicators such as straight-lining and speeding. These combined metrics were used to identify interviews requiring follow-up investigations, ensuring the overall quality and reliability of the survey data.

Table 2: Share of item non-response per question (unweighted results)

Question ¹⁰	Number of item non-response (NA/DK ¹¹)	Share of item non-response (NA/DK) in %	Question	Number of item non-response (NA/DK)	Share of item non-response (NA/DK) in %
Q100	116	0.3%	Q301	366	0.9%
Q101a	152	0.4%	Q302	398	1.0%
Q101b	37	0.1%	Q303a	577	1.4%
Q102	1,186	2.9%	Q303b	341	0.8%
Q104	167	0.4%	Q304_1	761	1.8%
Q106	183	0.4%	Q304_2	809	2.0%
Q106x	209	0.5%	Q304_3	639	1.5%
Q107	195	0.5%	Q304_4	1,078	2.6%
Q108	287	0.7%	Q304_5	781	1.9%
Q112x	179	0.4%	Q304_6	12	0.0%
Q115	273	0.7%	Q304_8	13	0.0%
Q1138	421	1.0%	Q304_9	7	0.0%
Q150	255	0.6%	Q305	411	1.0%
Q151_1	427	1.0%	Q306	799	1.9%
Q151_2	934	2.3%	Q307	1,250	3.0%

¹⁰ Question number according to the "ESENER 2024 Ipsos Datafile".

¹¹ NA = No answer; DK = Don't know

ESENER 2024 Quality report

Question ¹⁰	Number of item non-response (NA/DK ¹¹)	Share of item non-response (NA/DK) in %	Question	Number of item non-response (NA/DK)	Share of item non-response (NA/DK) in %
Q151_3	794	1.9%	Q308_1	94	0.2%
Q151_4	850	2.1%	Q308_2	92	0.2%
Q151_5	918	2.2%	Q308_3	100	0.2%
Q152	540	1.3%	Q308_4	82	0.2%
Q154	1,447	3.5%	Q309	1,459	3.5%
Q155	500	1.2%	Q310_1	162	0.4%
Q156	275	0.7%	Q310_2	115	0.3%
Q157_1	338	0.8%	Q310_3	319	0.8%
Q157_2	326	0.8%	Q310_4	117	0.3%
Q157_3	263	0.6%	Q310_5	365	0.9%
Q157_4	259	0.6%	Q310_6	338	0.8%
Q158x_1	656	1.6%	Q310_7	172	0.4%
Q158x_2	350	0.8%	Q313_1	553	1.3%
Q159	2,423	5.8%	Q313_2	466	1.1%
Q160	1,060	2.6%	Q313_3	274	0.7%
Q161	248	0.6%	Q313_4	344	0.8%
Q162	191	0.5%	Q313_5	294	0.7%
Q163	312	0.8%	Q313_6	636	1.5%
Q164a	91	0.2%	Q313_7	464	1.1%
Q164b	70	0.2%	Q313_8	161	0.4%
Q200_1	191	0.5%	Q313_9	465	1.1%
Q200_2	282	0.7%	Q313_10	579	1.4%
Q200_3	135	0.3%	Q314_new	506	1.2%
Q200_4	288	0.7%	Q350_1	404	1.0%
Q200_5	176	0.4%	Q350_2	297	0.7%
Q200_6	222	0.5%	Q350_3	486	1.2%
Q200_7	155	0.4%	Q350_4	350	0.8%
Q200_8	184	0.4%	Q351	559	1.3%
Q200_9	185	0.4%	Q352	328	0.8%
Q200_10	202	0.5%	Q353	257	0.6%
Q201_1	254	0.6%	Q354	362	0.9%
Q201_2	301	0.7%	Q355_1	409	1.0%
Q201_3	585	1.4%	Q355_2	134	0.3%
Q201_4	266	0.6%	Q355_3	521	1.3%

ESENER 2024 Quality report

Question ¹⁰	Number of item non-response (NA/DK ¹¹)	Share of item non-response (NA/DK) in %	Question	Number of item non-response (NA/DK)	Share of item non-response (NA/DK) in %
Q201_5	183	0.4%	Q355_4	123	0.3%
Q202_1	222	0.5%	Q355_5	347	0.8%
Q202_2	398	1.0%	Q355_6	607	1.5%
Q202_3	486	1.2%	Q355_7	364	0.9%
Q202_4	317	0.8%	Q356	56	0.1%
Q202_5	1,235	3.0%	Q357	268	0.6%
Q250	517	1.2%	Q365bo	16	0.0%
Q251	206	0.5%	Q366bo_3	10	0.0%
Q252_1	458	1.1%	Q366bo_4	29	0.1%
Q252_2	122	0.3%	Q366bo_5	38	0.1%
Q252_3	478	1.2%	Q366bo_6	20	0.0%
Q252_4	411	1.0%	Q367bo_1	16	0.0%
Q252_5	873	2.1%	Q367bo_2	25	0.1%
Q252_6	563	1.4%	Q367bo_3	40	0.1%
Q252_10	466	1.1%	Q369bobis_13	33	0.1%
Q252_12	2	0.0%	Q369bobis_1	12	0.0%
Q253	190	0.5%	Q369bobis_2	12	0.0%
Q254	202	0.5%	Q369bobis_3	17	0.0%
Q256	1,769	4.3%	Q369bobis_4	8	0.0%
Q258	319	0.8%	Q369bobis_5	13	0.0%
Q260_1	198	0.5%	Q369bobis_6	17	0.0%
Q260_2	155	0.4%	Q371bo_1	75	0.2%
Q260_3	352	0.8%	Q371bo_2	68	0.2%
Q260_4	286	0.7%	Q371bo_3	23	0.1%
Q261	120	0.3%	Q371bo_4	30	0.1%
Q262_1	440	1.1%	Q371bo_5	80	0.2%
Q262_2	505	1.2%	Q371bo_6	78	0.2%
Q262_3	545	1.3%	Q372bo	1	0.0%
Q262_4	386	0.9%	Q373bo	67	0.2%
Q262_5	402	1.0%	Q374bo	115	0.3%
Q263_1	194	0.5%	Q375bo	117	0.3%
Q263_2	444	1.1%	Q376bo	37	0.1%
Q263_3	350	0.8%	Q377bo	14	0.0%
Q263_4	351	0.8%	Q401	107	0.3%

Question ¹⁰	Number of item non-response (NA/DK ¹¹)	Share of item non-response (NA/DK) in %	Question	Number of item non-response (NA/DK)	Share of item non-response (NA/DK) in %
Q263_5	386	0.9%	Q201_CH_6	11	0.0%
Q263_6	403	1.0%	Q201_CH_7	16	0.0%
Q263_7	570	1.4%	Q378bo11	1	0.0%
Q300	577	1.4%	Q378bo12	3	0.0%

2.4 Sampling errors

In probability sample surveys like ESENER 2024, researchers investigate a selection of units to draw conclusions about the entire universe – in this case, all establishments with 5 or more employees in the 30 participating European countries. While larger samples generally reduce sampling error, the sample composition is equally crucial. The sample must adequately represent different subgroups of the population, with a sufficiently large number of interviews for each important subgroup. This ensures that conclusions are not drawn on a weak empirical basis and that the analysis can meaningfully distinguish between different segments of the universe under investigation.

ESENER 2024 employed a multi-stratified random sampling procedure. The universe was divided into strata defined by country, size, and sector, resulting in 76 strata per country (4 size classes and 19 sectors). For each stratum, the target number of interviews was defined using a mixed approach that balanced establishment and employee proportionality.

- For size classes, the target was calculated by combining the percentage share of establishments and employees. Specifically, the percentage share of establishments was doubled, added to the percentage share of employees, and the sum was divided by three. To illustrate this method, consider a hypothetical country where 40% of all establishments within the defined universe have 5 to 9 employees, and 20% of all employees work in these establishments. The calculation for this size class would be: $((40\% * 2) + 20\%) / 3 = 33.3\%$. This percentage would then determine the target number of interviews for the 5 to 9 employee size class in that country.
- Within each size class, the sector targets were then set proportionally to the number of establishments in each sector.

Within each stratum, samples were randomly drawn from selected address registers. The ratio of gross addresses per targeted net interview varied based on the response rate achieved in ESENER 2019 for each country, sector, and size. When local fieldwork teams exhausted addresses for particular cells, new addresses were provided as replacements.

This stratified method offers advantages over simple random sampling by ensuring sufficient addresses for each segment. In unstratified sampling, the majority of addresses would be from small establishments, providing a weak empirical basis for larger size classes. However, this method has drawbacks. The even distribution of interviews across size classes leads to large establishment-proportional weighting factors for small size classes, increasing the uncertainty of extrapolation. Additionally, interviewing larger companies presents unique challenges, as interviewers must navigate gatekeepers, requiring more contact attempts and longer introductions, thus increasing resource demands.

2.4.1 Sampling errors resulting from the screening process

In 16 countries, company-level addresses were used due to unavailable establishment-level registers. This necessitated a screening process to identify eligible establishments within multi-site organisations.

In the interview, multi-site organisations were first screened for the number of local units they consist of:

- If the initial contacted establishment (i.e. the one listed on the sampling frame for the company) had five or more employees, it was eligible for interview. If it was not eligible then the selection would be made out of the other establishments.
 - Of the remaining/all eligible establishments in the organisation, up to two from all of those with five or more employees were selected at random to be included in the survey. The following rules were applied:
 - One additional establishment for companies with between two and five units, or two additional establishments if the contacted site was not eligible (both options obtaining two establishments in total).
 - Two additional establishments (three in total) for companies with six or more units. However, a maximum of two additional units were asked for, meaning that the total to interview was two units if the initially contacted establishment was not eligible.
- To facilitate randomisation and identification of the selected site by the person completing the screening questions, the following steps were followed:
 - Respondents asked to give counts of additional sites in each of the four ESENER size categories (5-9, 10-49, 50-249, 250+).
 - One size class containing additional establishments was selected randomly by the script. Depending on the number of sites in this category and the number to select, respondents were asked for the only establishment (select one from one), the smallest establishment (select one from many), or the smallest and largest establishments (select two from many).
 - If the selected size class contained one establishment only and two were required, a second establishment was requested from a further randomly selected size class following the rules directly above.
- Interviewers were able to defer collection of the contact information to the end of the main interview (for eligible contacted sites).

This screening procedure ensured consistency across all countries by focusing interviews on similar types of units, namely a selection of headquarters and subsidiaries. However, it also introduced a limitation: in countries requiring screening, a maximum of three units (typically the headquarters and two subsidiaries) could be selected for each multi-site organisation. This contrasts with countries using establishment-based registers, where significantly more than three units from a single organisation with numerous sites could potentially be included in the sample. As a result, subsidiary units of multi-site enterprises are likely to be underrepresented in countries where screening was necessary. This underrepresentation is particularly pronounced in sectors characterized by a high proportion of multi-site organisations. Notable examples include the financial and insurance sector (NACE K) and retail trade (part of NACE G), where this sampling approach may not fully capture the diversity of subsidiary establishments.

Anticipating this under-coverage, corrective measures were implemented. The first step involved using estimated figures for the universe of establishments, rather than companies, as the basis for calculating targets within each cell. This approach aimed to better reflect the true distribution of establishments. Secondly, the weighting process was adjusted to improve the representation of subsidiaries in countries where screening was necessary. Subsidiaries of multi-site organisations were assigned an additional weight, referred to as a “selection factor”, to compensate for the differences in selection probabilities. This selection weight was calculated based on the total number of subsidiaries an organisation had within a given sector. To prevent individual interviews with potentially atypical response patterns from exerting undue influence on the results, the entry weight was capped at a maximum factor of 5 for each subsidiary interview. It is important to note that this selection weight was not applied as a separate factor but was integrated into the various establishment-proportional weighting factors provided with the dataset.

2.4.2 Sampling rates

The 30 countries covered by ESENER 2024 varied greatly in size, ranging from about 6,100 establishments in Iceland to 1.1 million in Germany. The total universe is estimated at 5.4 million establishments. The survey targeted 40,950 interviews but achieved 41,458 validated interviews, surpassing the goal in several countries. This makes ESENER 2024 a large-scale survey, with few cross-national European establishment surveys having larger samples.

Despite adjusting sample sizes to the scale of national economies, sampling rates vary significantly across countries. Germany, the largest country in the sample, has the lowest sampling rate at 0.003, while Iceland has the highest at 0.113. To put this in perspective, one interview in Germany represents, on average, 363 establishments, whereas in Iceland, it represents just 8 establishments. This means an interview in Germany represents approximately 45 times as many establishments as one in Iceland.

It is important to note that within each country, these sampling rates differ by establishment size and, to a lesser extent, by sector. Generally, the representational factor is highest for the smallest establishments and lowest for the largest ones. This variation in sampling rates leads to differing levels of statistical precision across countries. Two main factors contribute to this large variance:

- The use of staggered sample sizes in ESENER results in varying degrees of precision for national samples. While adapting sample sizes more closely to the size of national economies would improve overall precision, it would result in very small sample sizes for smaller countries. This would lead to a low number of observations, particularly within each cell of the sampling matrix, making national-level analyses problematic. Therefore, determining national sample sizes always involves a trade-off in surveys covering economies of vastly different sizes.
- As the survey is funded by the EU, it would be challenging to justify a substantially wider range in the sizes of national samples. This funding context necessitates a balance between statistical ideal and practical considerations.

Table 3: Sampling rates, by country

Country	Establishment in NACE Rev.2 A to S	Net sample (Valid interviews achieved)	Sampling rate (net interviews / universe)	Average factor (number of establishments represented by one interview, on average)
TOTAL	5,406,410	41,458	0.008	130
Austria	137,043	1,829	0.013	75
Belgium	112,533	1,504	0.013	75
Bulgaria	92,191	765	0.008	121
Croatia	42,890	776	0.018	55
Cyprus	14,459	753	0.052	19
Czechia	110,177	1,526	0.014	72
Denmark	99,347	1,506	0.015	66
Estonia	17,815	768	0.043	23
Finland	72,852	1,510	0.021	48
France	715,353	2,273	0.003	315
Germany	1,146,588	3,159	0.003	363
Greece	117,819	1,501	0.013	78

Hungary	112,358	1,510	0.013	74
Ireland	75,333	761	0.010	99
Italy	646,627	2,255	0.003	287
Latvia	28,849	756	0.026	38
Lithuania	40,694	762	0.019	53
Luxembourg	12,365	759	0.061	16
Malta	7,584	453	0.060	17
Netherlands	177,483	1,505	0.008	118
Poland	317,365	2,268	0.007	140
Portugal	143,632	1,545	0.011	93
Romania	152,382	1,537	0.010	99
Slovakia	58,869	786	0.013	75
Slovenia	23,510	1,056	0.045	22
Spain	496,304	2,259	0.005	220
Sweden	137,307	1,536	0.011	89
Iceland	6,104	810	0.133	8
Norway	105,114	1,523	0.014	69
Switzerland	185,463	1,507	0.008	123

2.4.3 The structure of the net sample

The size and sector structure targets agreed upon by EU-OSHA and Ipsos during the fieldwork preparation phase were largely achieved, with a few exceptions:

- Firstly, some countries encountered difficulties in meeting quotas for the smallest establishments (5 to 9 employees). While the overall deviation was only 3%, it exceeded 20% for Poland, Luxembourg, and Malta (see Table 18 of the Technical Report). These challenges can be attributed to two main factors: weaknesses in the sampling frames, including outdated addresses and changes in workforce size, and higher non-response rates among these small establishment.
- Secondly, the situation for the largest size class (250+ employees) varied across countries and sectors. Overall, the originally agreed targets for this group were not fully met, with the net sample containing 1% fewer interviews than initially targeted. This issue was mainly observed in the sector grouping NACE J, K, L, M, N, S, where 17 countries had a deviation of 20% or more (see Table 18 of the Technical Report).
- Lastly, the overall sector targets were achieved with a high degree of success. Only the sector grouping NACE G, H, I, R showed slight shortfalls, with the achieved net samples 4 percentage points lower than targeted. The maximum deviation was 18% in Ireland, linked to shortfalls in three out of the four size classes (only partially compensated by additional interviews completed in the 10 to 49 employees size class). (See Tables 19 and 39 of the Technical Report)

For a more detailed breakdown of the achieved size and sector structures, refer to section 6.3 of the Technical Report.

2.4.4 The magnitude of sampling errors in the full sample and in sub-samples

The inherent variation in random sampling surveys can be expressed through various measures, including standard error and confidence intervals. For ESENER 2024, confidence intervals are primarily used as they provide a clear, illustrative measure of sampling precision.

A confidence interval indicates the range within which the true population value is likely to lie, given the sample estimate. The study uses a 95% probability level, meaning there is 95% confidence that the true value falls within this range. The 95% confidence level indicates that if this survey were conducted 100 times using the same methodology and sample size, the true population value would be expected to fall within the calculated confidence interval in approximately 95 of those surveys. Conversely, in about 5 out of 100 instances, the true value might lie outside this range.

The confidence interval is calculated using the standard error (se). For a proportion, the standard error is calculated as:

$$se = \sqrt{p(1-p)/n}, \text{ where } p \text{ is the sample proportion and } n \text{ is the sample size.}$$

The confidence interval is then calculated with the lower limit at $-1.96 \cdot se$ and the upper limit at $+1.96 \cdot se$ from the sample estimate.

Two main factors influence the width of the confidence interval. Firstly, the sample size - larger samples generally yield narrower intervals, indicating greater precision. Secondly, the distribution of answers plays a role; values closer to 50% tend to have wider intervals than those near 0% or 100%, due to greater variance in the population.

For ESENER 2024 total net sample of 41,458 interviews, the confidence interval is very narrow for unfiltered questions, with a maximum of ± 0.5 percentage points (not accounting for design effects). This allows for highly precise estimates of overall survey results.

However, for sub-samples, the confidence intervals widen due to smaller sample sizes. National samples range from 453 to 3,159 interviews. Sector samples, based on NACE Rev.2 1-digit classification, vary from as few as 165 interviews in Mining and quarrying to as many as 3,359 in Wholesale and retail trade. The size-class samples range from 3,670 interviews for establishments with 250+ employees to 17,333 for those with 10-49 employees.

For more detailed analyses, such as examining a specific size category in a particular sector within a single country, confidence intervals can exceed $\pm 10\%$. Therefore, country-level analyses should focus on either size or sector separately, not both simultaneously. When combined size and sector analyses at the national level are necessary, they should use broadly summarised sectors or focus on selected large NACE sections.

To illustrate how confidence intervals work in practice, consider two scenarios:

1. For a question where 80% of respondents answer affirmatively (for example, conducting risk assessments), out of a total of 450 interviews, the true value likely lies between 76.3% and 83.7%. With a larger sample of 2,250 interviews, this range narrows to between 78.3% and 81.7%.
2. For a question with more varied responses, where 50% answer affirmatively, the confidence interval is slightly larger. With 450 interviews, the true value likely lies between 45.4% and 54.6%, while for 2,250 interviews, this range narrows to between 47.9% and 52.1%.

Table 4: Standard error and confidence interval at different levels of disaggregation

Size of the (sub-) sample (n =)	Percentage	Standard error	Confidence interval (95%)	Range (min)	Range (max)
100	80.0%	4.0%	7.8%	72.2%	87.8%
450	80.0%	1.9%	3.7%	76.3%	83.7%

750	80.0%	1.5%	2.9%	77.1%	82.9%
1,000	80.0%	1.3%	2.5%	77.5%	82.5%
1,500	80.0%	1.0%	2.0%	78.0%	82.0%
2,250	80.0%	0.8%	1.7%	78.3%	81.7%
5,000	80.0%	0.6%	1.1%	78.9%	81.1%
20,000	80.0%	0.3%	0.6%	79.4%	80.6%
41,458	80.0%	0.2%	0.4%	79.6%	80.4%
100	50.0%	5.0%	9.8%	40.2%	59.8%
450	50.0%	2.4%	4.6%	45.4%	54.6%
750	50.0%	1.8%	3.6%	46.4%	53.6%
1,000	50.0%	1.6%	3.1%	46.9%	53.1%
1,500	50.0%	1.3%	2.5%	47.5%	52.5%
2,250	50.0%	1.1%	2.1%	47.9%	52.1%
5,000	50.0%	0.7%	1.4%	48.6%	51.4%
20,000	50.0%	0.4%	0.7%	49.3%	50.7%
41,458	50.0%	0.2%	0.5%	49.5%	50.5%

2.5 The questionnaire

The ESENER 2024 master questionnaire was finalised in close collaboration with EU-OSHA, building upon the ESENER 2019 version of the questionnaire. The development of the questionnaire for ESENER 2024 presented several challenges, primarily centred around balancing the need for comparability across waves with the desire to introduce new, relevant questions. This balance is crucial for maintaining trend data while also ensuring the survey remains responsive to emerging OSH issues.

One key challenge was ensuring that new questions aligned with respondent capabilities and were suitable for telephone interviews. The complexity of OSH topics sometimes led to the proposal of questions that, while interesting from a research perspective, were difficult for respondents to answer accurately over the phone.

The questionnaire was subsequently tested via:

- A translatability assessment of the master questionnaire carried out for three languages (Croatian, Finnish and Greek).
- A cognitive pre-test of the master questionnaire carried out in three countries (Germany, Poland and Spain), with a total of 47 in-depth interviews.
- A pilot test in all 30 countries with 30 interviews per country.

For the translation of the survey questionnaire, Ipsos translation partner cApStAn followed the TRAPD¹² approach for new and adjusted trend questions. This method involves multiple stages of review and editing to ensure a very high level of accuracy and quality in the translations. EU-OSHA engaged with its network of focal points to review the new translations. Trend questions were not newly translated; instead, the ESENER 2019 translations were used (unless otherwise agreed with EU-OSHA, as described in section 4.7 of the pilot report).

¹² TRAPD = Translation, Review, Adjudication, Pretesting, and Documentation

2.6 Interviewer effects

The careful selection, extensive training, and consistent monitoring of experienced interviewers for ESENER 2024 were designed to minimise potential interviewer effects and ensure high-quality data collection. Ipsos worked with both its own field agencies and partner agencies to conduct the survey. For both the pilot and main fieldwork, local agencies in each country assembled teams comprising a project manager, experienced supervisors, and skilled interviewers.

A total of 766 interviewers participated in the main fieldwork (see details per country in Table 15 of the Technical Report). Each interviewer had a minimum of two years of experience in CATI business surveys, underwent comprehensive, tailored ESENER interview training, and successfully completed at least one test interview before beginning actual survey work.

The supervisors and local fieldwork managers responsible for interviewer training had previously attended two comprehensive training seminars: a two-day seminar conducted before the pilot survey, and another two-day seminar held after the pilot and shortly before the commencement of the main survey fieldwork. These seminars equipped them to provide thorough and consistent training to the interviewers. The project managers and supervisors conducted the interviewer training using a comprehensive briefing document available in the local language. This document covered a wide range of topics, including background information on ESENER and EU-OSHA, the survey's objectives, and detailed guidance on the contact phase, which encompassed the introduction, screening process, motivation letter, and CAWI invitation email. The document also provided in-depth instructions on the main questionnaire, including proper use of 'don't know' and 'no answer' options, when to read out interviewer instructions, and specific focus areas. These areas included OSH expertise and general policy, health and safety risks in the establishment, risk assessments, psychosocial risks and digitalisation, and employee participation in OSH issues. For each of these key topics, the document highlighted specific points of attention to ensure consistent and accurate data collection across all interviews.

To ensure consistency and expertise, interviewers were asked to conduct between 50 and 120 interviews each (excluding the pilot). This range was carefully chosen to allow interviewers to become thoroughly familiar with the questionnaire and develop effective strategies for handling common challenges, such as overcoming objections to participation, accurately assigning sectors, and addressing frequent questions about survey content.

The size of interviewer teams was strategically balanced. While individual interviewers needed to conduct enough interviews to gain proficiency, teams were kept large enough to mitigate the potential impact of individual interviewer bias or systematic differences in interviewing styles on overall data quality. This approach aimed to ensure consistency in data collection while minimising the risk of any single interviewer's method disproportionately influencing the results.

In a small number of cases, deviations from these guidelines were agreed upon with EU-OSHA to accommodate specific circumstances.

Throughout the fieldwork, supervisors regularly monitored at least 10% of interviews and contact attempts through listening-in spread across the different interviewers.

This rigorous monitoring allowed for the swift detection of any undesired interviewer influences. When issues were identified, immediate corrective actions were taken, including additional individual or general training, or in some cases, removal of the interviewer from the ESENER 2024 project. In rare instances, interviews were disqualified and removed from the dataset due to quality concerns identified during this process.

To ensure ongoing quality control and optimal performance, local teams were provided with a comprehensive daily interviewer analysis. This in-depth report contained crucial information about each interviewer's performance and the overall progress of the survey. The analysis included:

1. Contact, Response and Productivity Metrics:

- Total number of establishments contacted

- Total number of completed interviews
- Total number of refusals, including those after eligibility was confirmed
- Interview completion rate (completes / total contacts)
- Refusal rate (refusals / total contacts)

2. Quality Control Indicators:

- Number of interviews flagged for in depth quality control based on straight-lining, speeding, and item non-response checks
- Number of interviews quality controlled to date
- Proportion of disapproved interviews to date
- Proportion of completed interviews flagged as high item non-response
- Average, median, minimum, and maximum duration of interviews conducted by each interviewer
- Difference between the interviewer's average and median duration compared to the country-wide averages

3. Workload Metrics:

- Proportion of total interviews conducted by each interviewer
- Flag if the interviewer was exceeding the maximum allowed number of interviews

This daily analysis allowed project managers and supervisors to closely monitor the performance of each interviewer, identify any potential issues promptly, and take corrective actions when necessary. It also helped ensure that the data collection process remained consistent and of high quality throughout the fieldwork period.

2.7 Respondent effects

In surveys like ESENER 2024, there is a potential for respondents to provide socially desirable answers, particularly when questions portray the organisation as a 'good' or 'bad' employer or concern compliance with legal obligations. Despite assurance of anonymity at the survey's outset, respondents may occasionally provide answers that present their organisation in a more favourable light, especially regarding health and safety provisions that are either mandatory or considered good practice.

Questions potentially susceptible to socially desirable responses include those about keeping records of employees' absence due to sickness (Q158x_1), availability of an action plan to prevent work-related stress (Q300), carrying out workplace assessments (Q250), training to prevent psychosocial risks such as stress or bullying (Q355_3), etc.

Whilst social desirability effects may be expected, it is important to note that there are no reliable external benchmarks available to quantify the extent of this phenomenon. The impact of social desirability may vary across countries and respondent types, influenced by factors such as employment relation stability and general trust in survey data confidentiality.

To explore potential measurement errors due to social desirability, we conducted some logistic regression analyses using the ESENER 2024 dataset. These analyses examined whether the respondent's function in the establishment (Q113) influenced answers on core topics such as risk assessments and employee training. The data in Table 5: illustrates that carrying out risk assessments was more frequently reported by managers with specific OSH tasks compared to other respondent categories.

Table 5: Weighted proportion of respondents per function answering “Yes” on question Q250

Q113 Function in this establishment	Q250 Does your establishment regularly carry out workplace risk assessments %Yes
Total	73.2%
Owner of a firm, managing director, site manager	70.5%
Manager without specific OSH tasks	83.8%
Manager with specific OSH tasks	87.6%
OSH specialist without managerial function	83.1%
Employee representative in charge of OSH	78.8%
Another employee in charge of the subject	75.6%
External OSH consultant	74.8%
No answer	73.2%

The logistic regression analyses revealed statistically significant differences across respondent types for Q250 (Risk Assessment conducted), with varying degrees of practical significance. The results were highly significant ($p < 0.001$) for most respondent categories, except for 'External OSH consultant' ($p = 0.536$) and 'No answer on Q113' ($p = 0.939$), which had very small base sizes.

The odds ratios (OR) ranged from 0.856 to 2.618, indicating different likelihoods of reporting regular risk assessments compared to the reference category "Owner of a firm, managing director, site manager". Specifically:

- OSH Specialists without managing function had the highest odds (OR = 2.618, 95% CI¹³: 2.377-2.883) of reporting regular risk assessments.
- Managers with specific OSH tasks (OR = 1.850, 95% CI: 1.633-2.097) and Employee representatives in charge of OSH (OR = 1.756, 95% CI: 1.562-1.975) also showed significantly higher odds.
- Another employee in charge of the subject had moderately higher odds (OR = 1.300, 95% CI: 1.219-1.386).
- Interestingly, Managers without specific OSH tasks had slightly lower odds (OR = 0.856, 95% CI: 0.806-0.910) of reporting regular risk assessments compared to the reference category.

The results suggest that the respondent's role and OSH-specific responsibilities significantly influence the reporting of regular risk assessments, with OSH specialists and those with specific OSH tasks being more likely to report such assessments.

¹³ CI = confidence interval.

Table 6: Mode effect regression model

Q250 « Risk Assessment conducted »	Level of significance ¹⁴	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio- Lower	Confidence interval odds ratio - Upper
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	<0.001	0.856	0.806	0.910
Manager with specific OSH tasks	<0.001	1.850	1.633	2.097
OSH Specialist without managing function	<0.001	2.618	2.377	2.883
Employee representative in charge of OSH	<0.001	1.756	1.562	1.975
Another employee in charge of the subject	<0.001	1.300	1.219	1.386
External OSH consultant	0.536	1.094	0.822	1.456
NA on Q113	0.939	0.992	0.816	1.208

Whilst these differences are statistically significant, they may align with expected results. For instance, health and safety specialists reported higher rates of risk assessment, which could reflect their expertise and involvement rather than solely a social desirability effect. Their presence might indicate a greater organisational commitment to health and safety practices.

In interpreting these results, it is crucial to consider both statistical significance and practical implications, acknowledging that observed differences may reflect genuine variation in awareness or implementation of health and safety practices across different roles within organisations.

2.8 The data collection method

ESENER 2024 primarily employed telephone interviews (CATI) as the main data collection method, with an online survey option (CAWI) offered to respondents who initially refused to participate via telephone. This mixed-mode approach was adopted to increase overall participation rates and reach establishments that might be reluctant to engage in telephone surveys. While beneficial for increasing overall participation, this approach introduces potential methodological considerations that warrant examination.

To assess possible influences originating from the different modes of data collection, key OSH management practices were compared across CATI and CAWI respondents. The following table summarises the results for selected indicators.

¹⁴ Interpretation significance level: low (p<0.05); medium (p<0.01); high (p<0.005)

Table 7: Weighted proportion of respondents answering “Yes” on the selected OSH questions

	CATI	CAWI
Q250 Carry out workplace risk assessments	75%	79%
Q355_1 Provide employees with training on the use of working equipment	66%	66%
Q355_3 Provide employees with training on how to prevent psychosocial risks such as stress or bullying	38%	35%
Q314 Impact of digital technologies on OSH have been consulted on with employees	33%	28%
Q159 Sickness absence rather increased over the last 3 years	14%	13%
Q202_4 Provision of ergonomic equipment as measure taken in the last 3 years	71%	67%
Q357 Occasional or regular discussions of health and safety in staff or team meetings	79%	81%
Q158x_1 Keep record of employees' absences due to sickness	85%	86%

Initial observations from this data shows generally small differences between CATI and CAWI responses across the seven variables. The largest difference was observed for Q314 (Impact of digital technologies on OSH consulted with employees), where CAWI respondents reported lower rates (28%) compared to CATI respondents (33%). CAWI respondents reported slightly lower rates compared to CATI respondents for Training on preventing psychosocial risks (Q355_3), and Provision of ergonomic equipment as a measure taken in the last 3 years (Q202_4). An opposite tendency was noticed for Workplace risk assessments (Q250) where CAWI respondents reported slightly higher rates (79%) compared to CATI respondents (75%).

To assess potential mode effects, we conducted logistic regression analyses¹⁵ on the above seven questions, controlling also for various factors including country, establishment size, sector, respondent function, and risk profiles. The sample size for these analyses was 41,458 establishments. For more detailed results of the logistic regression analyses, please refer to Tables 10 to 16 in the annex.

The impact of survey mode on the studied outcomes appears to be limited. In most cases, the effect of mode (CAWI vs. CATI) was either not statistically significant or showed only a small practical difference.

Where statistically significant mode effects were observed, they were generally modest in magnitude. For example:

- Workplace risk assessment (Q250): CAWI respondents had slightly higher odds of reporting regular workplace risk assessments, though this effect was not statistically significant (OR = 1.073, $p = 0.342$).
- Employee training on working equipment (Q355_1): CAWI respondents had significantly higher odds of reporting such training (OR = 1.181, $p = 0.005$).
- Provision of ergonomic equipment (Q202_4): CAWI respondents had significantly higher odds of reporting this provision (OR = 1.243, $p < 0.001$).

¹⁵ This analysis has some limitations that should be considered. First, while we controlled for various factors in our logistic regression models, there may be unmeasured variables that influence both the choice of survey mode and OSH practices. Second, the small proportion of CAWI respondents limits our ability to detect subtle mode effects.

- Consultation on impact of digital technologies (Q314): CAWI respondents had significantly higher odds of reporting such consultation (OR = 1.362, $p < 0.001$), although raw proportions showed a lower rate for CAWI respondents.

For several outcomes, including sickness absence increase (Q159) and regular health and safety discussions (Q357), the mode of data collection did not show a statistically significant effect.

Only employee training on prevention of psychosocial risks (Q355_3) showed a substantial mode effect (OR = 1.551, $p < 0.001$). However, the raw proportions show a lower rate for CAWI respondents (35%) compared to CATI respondents (38%). This discrepancy suggests complex interactions between mode and other variables in the model, such as establishment size or sector influencing the likelihood of both CAWI participation and training on prevention of psychosocial risks.

CAWI respondents tended to represent larger establishments, which could influence some of the observed differences. The correlation between mode and establishment size, while statistically significant, was very weak ($r = 0.032$, $p < 0.001$). In practical terms, this means that while there is a slight tendency for larger establishments to use CAWI, the relationship is not strong enough to be a major concern.

Similarly, there was a weak but statistically significant correlation between country and mode ($r = 0.074$, $p < 0.001$), suggesting some variation in mode preference across countries. This indicates that certain countries may have a slightly higher proportion of CAWI respondents, but again, the relationship is not strong enough to substantially bias the results.

In conclusion, while some statistically significant mode effects were observed, their practical impact on the overall results appears to be limited. The majority of outcomes showed either no significant mode effect or only small differences between CATI and CAWI responses. The analysis suggests that the interview mode has a modest impact on certain occupational health and safety measures examined in the study.

The underlying reasons for these differences remain unclear. They could stem from (self-)selection bias, as online respondents initially declined telephone interviews and might represent organisations less focused on OSH practices. Alternatively, the variations could be attributed to the nature of online surveys, which offer greater anonymity and lack direct interaction with an interviewer, or to differences in the country, sector, or size profile of the establishments that completed the ESENER survey online. Given that online interviews represent only a small proportion of the total sample in most countries, the dual-mode approach does not generally pose a significant limitation to the overall comparability of the data.

2.9 Data processing

In computer-assisted surveys like ESENER, the need for extensive post-survey data cleaning and editing is significantly reduced. The survey software incorporates pre-programmed filters, effectively preventing interviewers or respondents from making filtering mistakes. Additionally, the system can perform real-time plausibility checks on related questions, allowing for immediate correction of any contradictory data.

A key feature of ESENER 2024 was the use of a single, unified script for both CATI and CAWI modes. This approach not only ensured consistency across data collection methods but also eliminated the risk of data processing errors that could arise from merging multiple datafiles. This integrated design significantly enhanced data quality and reduced the potential for mode-related discrepancies.

Plausibility checks are particularly useful for questions requiring numerical input. However, the main questionnaire for ESENER 2024 contained minimal numerical data, with the primary instance being the number of employees asked in Q102. Consequently, extensive plausibility checks were not integrated into the survey design.

To ensure data quality, various general data checks were implemented in the script prior to the launch of fieldwork. Furthermore, daily data checks were conducted using a programmed syntax after the commencement of fieldwork. These measures were instrumental in minimising filtering mistakes and other potential errors.

A specific type of data processing applied in ESENER 2024 was the ex-post coding of sector descriptions. This process was necessary for all interviews where respondents indicated that the sector code from the sampling frame was incorrect (Q108) and were unable to clearly identify the appropriate sector using the sector list provided (Q109). The coding was carried out by a small central team familiar with sector coding. This centralised approach to sector coding was chosen to ensure a very high quality of coding, minimising errors and maintaining a high degree of harmonisation and coherence across the dataset.

2.10 Weighting

The weighting procedure for ESENER 2024 was conducted with meticulous attention to detail, applying uniform rules across all countries while also accounting for specific characteristics of national net samples. For instance, cells with a low number of interviews were addressed through individual treatments such as cell consolidation.

To validate the weighted samples, the resulting structures (by size and sector) were compared against the respective structures of the national universe. These comparative results were provided to EU-OSHA for review. Further aspects of the weighting process, including measures of weighting effectiveness, are detailed in Section 7.4 of the Technical Report and are not repeated here. Similarly, the statistics used for the weighting are detailed in section 4.3 of the Technical Report.

The likelihood of errors arising from the weighting process itself is minimal. Each step of the weighting was performed by an expert in sampling and weighting, highly familiar with business surveys, business registers and business statistics to ensure accuracy and consistency.

However, we acknowledge the inherent challenges in working with varied data availability across different countries. These challenges included:

- The need to extrapolate company-level statistics to the establishment level in 17 countries.
- Estimation of missing sectors, particularly in the public sector (NACE P, O, and Q) and in NACE A and K, required in 19 countries.
- Estimation of ESENER size-class categories in nine countries where reference statistics covered different categories.

To address these challenges, a multi-step approach was employed, utilising various data sources including national statistical offices, Labour Force Survey data¹⁶, and Structural Business Statistics¹⁷ from Eurostat. Where official statistics were incomplete or unavailable, careful estimations were made using the best available data and validated against multiple sources.

Despite these complexities, every effort was made to provide the most accurate representation possible while maintaining comparability with ESENER 2019. The detailed methodology and country-specific approaches are fully documented in the Technical Report, ensuring transparency in the weighting process.

¹⁶ EU-LFS 2022 statistics on numbers of employees across the ESENER sampling cells (NACE Rev.2 by size of establishment). Data request to Eurostat on 12 January 2024.

¹⁷ Counts of companies for the years 2018 and 2022 were used to assess growth rates in covered ESENER cells: SBS covers companies with 10+ employees in NACE Rev.2 B-J, L-N. See: <https://ec.europa.eu/eurostat/web/structural-business-statistics/database>

3 Relevance

Relevance: “The degree to which statistical outputs meet current and potential user needs. It depends on whether all the statistics that are needed are produced and the extent to which concepts used (definitions, classification etc.) reflect user needs”¹⁸.

The relevance of ESENER stems from its unique position as an ongoing, Europe-wide survey that provides insights into workplace health and safety management practices. Its primary aim is precisely to find out how European workplaces, both private and public, are managing OSH, providing crucial information for policymakers to make informed decisions about allocating resources for the prevention of health and safety risks.

ESENER 2024, the fourth iteration of this survey, builds upon previous waves while aiming to collect robust current evidence from across Europe and enable rigorous analysis of trend data over time. While maintaining consistency with previous surveys for trend comparisons, ESENER 2024 also ensures relevance by reflecting the latest issues in workplace safety and health practices.

The survey provides valuable insights into:

1. General safety and health risks in the workplace and their management
2. Psychosocial risks, such as stress, bullying and harassment
3. Drivers of and barriers to OSH management
4. Worker participation in safety and health practices
5. The impact of digitalisation on workplace safety and health

This balance between consistency with previous surveys and adaptability to the latest issues is crucial for the survey's ongoing relevance to stakeholders. To this end a couple of measures were taken:

- Comprehensive coverage and dissemination
- Alignment with EU-OSHA's objectives
- Adaptation to current developments
- Expert involvement
- Cognitive testing

3.1 Comprehensive coverage and dissemination

ESENER 2024 covered over 41,000 establishments across 30 European countries, including both private and public sector establishments with five or more employees. This extensive coverage ensures the survey's relevance to a wide range of stakeholders across Europe.

The results of ESENER surveys are published in descriptive overview reports and are accessible via interactive dashboards¹⁹. Additionally, the survey findings are analysed in-depth in follow-up studies²⁰.

The accessibility of the ESENER data is further covered in chapter 6.

¹⁸ European Statistical System (ESS) framework (Eurostat Luxembourg, 2009): https://unstats.un.org/unsd/dnss/docs-ngaf/eurostat-esqr_final.pdf
Version 2019 : <https://ec.europa.eu/eurostat/documents/64157/4392716/ESS-QAF-V1-2final.pdf/bbf5970c-1adf-46c8-afc3-58ce177a0646>

¹⁹ See: <https://visualisation.osha.europa.eu/esener/en>

²⁰ See: <https://osha.europa.eu/en/publications>, topic : ESENER.

3.2 Alignment with EU-OSHA's objectives

The European Agency for Safety and Health at Work (EU-OSHA), which conducts ESENER, plays a crucial role in making Europe a safer, healthier, and more productive place to work. Based in Bilbao, Spain, EU-OSHA researches, develops, and distributes reliable, balanced, and impartial safety and health information, and organises pan-European awareness-raising campaigns.

The relevance of ESENER 2024 is further underscored by its alignment with EU-OSHA's key objectives:

- ESENER serves as a potential source of indicators and provides a 'snapshot' against which progress in OSH can be measured at both national and EU levels.
- The survey helps identify factors that encourage or impede preventative measures, thereby improving the effectiveness of policy implementation.
- By defining establishment needs according to their characteristics (size, sector, location, age, etc.), ESENER enables better-targeted support for businesses.
- The survey results facilitate improved targeting of measures such as support, guidance, information, and campaigns.

3.3 Adaptation to current developments

ESENER 2024 demonstrates its relevance by adapting to current developments in the world of work:

- Digitalisation: Recognising the increasing impact of digital technologies on OSH, new questions – or slight rewording of ESENER 2019 questions – were introduced to address this topic. These include:
 - inquiries about the presence of more recent digital technologies such as use of “Machines, systems or computers that use Artificial Intelligence to perform work tasks”;
 - inquiries about risk factors associated with the use of digital technologies;
 - whether the use of digital technologies has been discussed with employees.
- Remote work: To address the increasing prevalence of remote work, adaptations to the current question formulation were introduced to ensure remote work also captures remote and hybrid work beyond working from home and a new question on worker consultation practices related to this arrangement was included.
- COVID-19 impact: While questions specifically addressing the COVID-19 pandemic were initially considered, including potential increases in sickness absence due to COVID-19 and procedures for dealing with long COVID, these were ultimately not implemented in the final questionnaire after careful consideration and cognitive testing. However, ESENER 2024 still provides valuable insights into the effects of the pandemic on workplace health and safety practices. This is particularly significant given that ESENER 2019 was conducted pre-COVID, while ESENER 2024 took place in the post-COVID era. This timing allows for a unique before-and-after comparison, revealing how the pandemic has influenced OSH practices and priorities across European workplaces without directly asking about COVID-19.

3.4 Expert involvement

To ensure the continued relevance of ESENER, EU-OSHA (Prevention and Research Unit) and Ipsos engaged in a comprehensive process of questionnaire review and stakeholder consultation:

- OSH expert involvement: Prof. David Rees Walters and Dr. Emma Wadsworth, renowned OSH experts, were contracted by Ipsos to review and provide input on the questionnaire. Their expertise helped ensure that the survey questions remained relevant to current OSH practices and emerging issues. Prof. Walters and Dr. Wadsworth have worked extensively with EU-OSHA over the last decade developing considerable expertise over a range of areas which most recently have included work on OSH prevention services, compliance with OSH regulation and

a particular focus on OSH in micro and small enterprises. Both of them already had a good knowledge of the ESENER survey in particular, having been involved in several analyses of the ESENER 2009 and ESENER-2014 data²¹.

- Involvement of EU-OSHA's Digitalisation team: dedicated meetings were held with EU-OSHA's Digitalisation team to discuss proposed changes and amendments to the questionnaire relating to digital technologies, reflecting the growing importance of this area in modern workplaces – and EU-OSHA's increasing expertise on the topic.

3.5 Cognitive testing

To further ensure the relevance and effectiveness of new and modified questions, a comprehensive cognitive testing phase was conducted between 10 November and 4 December 2023. The primary purpose of such interviews was to examine how respondents reacted to amended question wording, clarification text and response categories as well as how participants understood and interpreted new questions. The cognitive interviews also aimed to capture more general views on the way the survey was introduced and framed.

The cognitive testing phase was extensive and methodical. A total of 45 cognitive interviews were carried out across three countries: Germany, Poland, and Spain, with 15 interviews conducted in each country. This distribution ensured a diverse range of perspectives from different European contexts.

The scope of the cognitive testing was broad, encompassing 21 questions in total. This included 11 modified existing questions from the previous ESENER survey wave and 8 new questions. The topics addressed in these questions were varied and relevant to current workplace issues, with a particular focus on digital technologies and remote work.

The process of cognitive testing was rigorous and carefully planned. It began with the meticulous recruitment of participants to ensure a good distribution across size and sector. The development of interview materials was equally thorough, designed to elicit detailed and meaningful responses. Following the interviews, comprehensive debriefing sessions were held to analyse the findings. These sessions were crucial in formulating recommendations for the final questionnaire, ensuring that the survey questions were not only relevant but also clear and easily understood by respondents across different countries and contexts.

²¹ <https://osha.europa.eu/en/publications/worker-representation-and-consultation-health-and-safety-analysis-findings-european>
<https://osha.europa.eu/en/publications/analysis-determinants-workplace-occupational-safety-and-health-practice-selection-eu>
<https://osha.europa.eu/en/publications/worker-participation-management-occupational-safety-and-health-qualitative-evidence>
<https://osha.europa.eu/en/publications/management-occupational-health-and-safety-european-workplaces-evidence-second-european>

4 Coherence and comparability

Coherence: “The degree to which the statistical processes by which they [the statistical data] were generated used the same concepts – classifications, definitions, and target populations – and harmonised methods. Coherent statistical outputs have the potential to be validly combined and used jointly”²².

Comparability: “A special case of coherence, referring to cases where the statistical outputs refer to the same data items and the aim of combining them is to make comparisons over time, or across regions, or across other domains.”

ESENER 2024 employed a consistent methodology across all participating countries. National language versions of the survey questionnaire were strictly harmonised, ensuring full comparability between countries. The survey was centralised in numerous aspects, including coordinated sample purchase, drawing of the gross sample, sample release, scripting, as well as centralised fieldwork monitoring, quality control and NACE coding. This centralised approach allowed for a uniform survey rollout across all countries involved.

Decentralisation was applied in two key areas:

- Translation: Local experts conducted translations, with the TRAPD approach, ensuring harmonisation in case of discrepancies.
- Interviewing: Local fieldwork teams deployed native-speaking interviewers and supervisors. The central coordination team monitored fieldwork daily, with local teams having access to the same details. Built-in quality control measures allowed both central and local teams to monitor quota completion, individual interviewer performance, interviews flagged for in-depth quality control due to speeding, straight-lining, or high item non-response, and more. The central team provided feedback and guidance to local teams based on observed findings.

To ensure coherence and facilitate knowledge exchange, pilot and main field briefing seminars were organised with all countries participating together.

Comparability with previous waves was a key factor in the study design, influencing the questionnaire content and the approach to translations, sampling, quota targets, methodology, fieldwork, etc. This focus on maintaining consistency with previous iterations of ESENER enhances the ability to track trends over time.

To further ensure comparability with previous waves, ESENER 2024 maintained consistency in several key areas:

- Questionnaire: Only minor changes were made to the questionnaire, preserving comparability with previous waves while addressing new and emerging issues.
- Translation: Translations from previous waves were reused for unchanged questions. For new or adjusted questions, the rigorous TRAPD process (Translation, Review, Adjudication, Pretesting, and Documentation) was employed, involving two translators, reconciliation, adjudication, proofreading, and documentation.
- Training: In-person training of local project managers and local field supervisors was conducted prior to both the pilot and the main fieldwork, as was the case in the previous wave. This comprehensive training covered a wide range of topics to ensure a uniform understanding of the survey and a consistent approach across all countries. The training seminar included topics

²² European Statistical System (ESS) framework (Eurostat Luxembourg, 2009): https://unstats.un.org/unsd/dnss/docs-nqaf/eurostat-esqr_final.pdf
Version 2019: <https://ec.europa.eu/eurostat/documents/64157/4392716/ESS-QAF-V1-2final.pdf/bbf5970c-1adf-46c8-afc3-58ce177a0646>

such as the background of ESENER, contact phase procedures, screener and questionnaire details, the sample, fieldwork organisation, monitoring and reports, training of interviewers, and interactive elements to reinforce learning.

- Sampling: Identical sampling frames (to the previous survey wave) were used where possible. Changes in sampling frames were only made in cases where better frames became available or previous frames were no longer accessible.
- Data collection method: A similar method was employed, whereby establishments were contacted by phone and only in case of refusal to telephone surveys, an online survey completion was offered.
- Pilot phase: As with the previous wave, a pilot phase preceded the main fieldwork to test and refine the survey instruments and procedures.
- Fieldwork: Similar approaches to previous waves were used, including multiple call attempts, batch release of samples, close field monitoring, regular meetings with EU-OSHA on progress and findings, and weekly field reports.
- NACE coding: The survey continued to use the NACE Rev.2 classification system at the 2-digit level for sector classification, with a refined process for confirming and allocating sector codes during the interview.
- Weighting: A similar weighting approach to previous waves was employed.

Assessing the comparability of ESENER data with other sources presents challenges, as few countries conduct similar surveys on workplace health and safety. Where national surveys do exist, differences in methodology often preclude direct comparisons. However, internal comparability between ESENER waves provides valuable insights. At the aggregate level (across all countries), results for questions asked identically in previous waves show good comparability. Many variables remain stable or show plausible developments, such as increased working from home. It is important to note that at the national level, some trend variables show more substantial changes between waves. This could be due to various factors, including genuine changes in the OSH landscape, differences in sample composition, or evolving interpretations of certain concepts over time.

This approach to coherence and comparability ensures that ESENER 2024 data maintains high reliability for cross-national comparisons and trend analyses, providing valuable insights into OSH practices across Europe.

5 Timeliness and punctuality

Timeliness: “The length of time between the event or phenomenon they describe and their availability”.

Punctuality: “The time lag between the release date of data and the target date on which they were scheduled for release as announced or previously agreed among partners”.²³

The ESENER 2024 project operated within a tight timeline, with two key milestones: the contract signature on 1 September 2023 and the data delivery deadline of 31 October 2024. This compressed schedule necessitated efficient planning and execution of all intermediate steps.

Close collaboration between the Ipsos team and EU-OSHA was crucial in maintaining the project pace. Both parties demonstrated commitment to swift turnaround and sign-off times, which was essential for meeting the project's deadlines.

Key project milestones included:

- Kick-off meeting: 6 - 7 September 2023.
- Cognitive pre-test: 10 November - 4 December 2023.
- Pilot questionnaire sign-off: 15 December 2023.
- Training translation teams: 18 - 19 January 2024.
- Translation overlay: 11 March 2024.
- Pilot training seminar: 11 - 12 March 2024.
- Pilot test: 18 - 29 March 2024.
- Delivery of pilot data and the pilot report: 8 - 9 April 2024.
- Main phase questionnaire sign-off: 18 April 2024.
- Main field training seminar: 16 - 17 May 2024.
- Main stage fieldwork: 20 May - 27 September 2024.
- Delivery of cleaned and weighted dataset: 31 October 2024.

The project tight timeline necessitated both flexibility and strategic planning. To meet the challenging deadlines while maintaining quality, the following approaches were implemented:

- Adaptive scheduling:
 - Scripting and testing activities were conducted during the Christmas period.
 - Field teams carried out surveys during the summer period.
 - Training seminars were scheduled around national bank holidays to ensure timely completion.
- Efficient project management:
 - Parallel processing of tasks where possible, such as conducting the translatability assessment alongside cognitive testing.
 - Regular status meetings to quickly identify and address potential delays.
 - Flexible allocation of resources to address bottlenecks in the project timeline.

This combination of flexible scheduling and efficient project management, in combination with its extensive experience in the field of running large multi-country projects allowed the team to navigate the compressed timeline effectively while maintaining the high standards required for the ESENER 2024 survey. Furthermore, to ensure timely data delivery (clean and weighted) by 31 October 2024, interim milestones were established in agreement with field agencies and EU-OSHA. These milestones

²³ European Statistical System (ESS) framework (Eurostat Luxembourg, 2009): https://unstats.un.org/unsd/dnss/docs-nqaf/eurostat-esqr_final.pdf
 Version 2019: <https://ec.europa.eu/eurostat/documents/64157/4392716/ESS-QAF-V1-2final.pdf/bbf5970c-1adf-46c8-afc3-58ce177a0646>

specified the proportion of fieldwork to be completed by certain dates, as detailed in Section 6.7.1 of the Technical Report.

Throughout the project, EU-OSHA was provided with regular updates to facilitate close monitoring of progress. These updates included weekly field reports that focused on progress and quota adherence, as well as interim survey results that allowed early insight into the data content. This approach enabled EU-OSHA to monitor the project's progress closely and prepare for the analysis phase concurrently with the final stages of data collection.

Despite the tight timeline, the project maintained a strong commitment to quality. This was achieved through:

- Thorough quality control processes at each stage of the project.
- Continuous monitoring and adjustment of fieldwork strategies.
- Regular communication and collaboration between all parties involved.
- Leveraging expertise and lessons learned from previous ESENER waves.

The detailed quality control plan in Chapter 10 of this report provides a comprehensive assessment of timeliness for each project task, including questionnaire design, translation, and other critical milestones.

6 Accessibility

Accessibility: “Accessibility and clarity refer to the simplicity and ease with which users can access statistics, with the appropriate supporting information and assistance”.²⁴

Throughout the ESENER 2024 project, comprehensive documentation has been continuously submitted to EU-OSHA. This documentation includes interim and final reports, SPSS syntaxes, and various other project-related documents, along with the survey data and metadata.

In line with the practices established for surveys conducted by EU agencies, EU-OSHA will make the technical documentation of ESENER 2024 publicly available²⁵. This commitment to transparency extends to the publication of a series of reports analysing the survey findings.

The dissemination of ESENER 2024 results follows a structured timeline:

- In late 2024, prior to the public release, the EU-OSHA team presented key findings to stakeholders, allowing for targeted communication of results.
- The first public release of findings took place on 7 February 2025, marking the beginning of broader dissemination efforts²⁶.
- Following these initial releases, a series of in-depth analytical reports are to be published, exploring various aspects of the survey results in detail. Additionally, ESENER 2024 data is to be further analysed by EU-OSHA to assess OSH practices across Europe, with findings to be reported in due course. These analyses shall contribute to evidence-based policy-making and help improve the prevention of work-related accidents and diseases, aligning with key objectives of the EU Strategic Framework on Health and Safety at Work²⁷.

To further enhance accessibility and facilitate secondary research, the micro-data from ESENER 2024 will be made available for download by researchers through international survey data archives (GESIS, as for the three previous survey waves). This approach ensures that the valuable insights gathered through ESENER 2024 can contribute to ongoing research and policy development in the field of OSH.

The dissemination of ESENER data extends beyond the dedicated ESENER website. EU-OSHA actively communicates the survey results through various channels, including social media platforms such as X (formerly Twitter) and LinkedIn. The findings are also presented at various conferences, enhancing their reach within the policy making, academic and professional communities. For instance, the ESENER methodological approach will be presented at the 11th Conference of the European Survey Research Association (ESRA) in Utrecht, The Netherlands, from 14 to 18 July 2025²⁸.

The impact and accessibility of ESENER data are further evidenced by their uptake in various contexts. The following examples, while not exhaustive, illustrate the wide-ranging use and reference of ESENER data:

- Academic institutions, other organisations and media: For example, the European University Institute (EUI) has dedicated an entire webpage to ESENER²⁹, highlighting its significance in the field of OSH research. The European Trade Union Institute (ETUI) has cited ESENER in its

²⁴ European Statistical System (ESS) framework (Eurostat Luxembourg, 2009): https://unstats.un.org/unsd/dnss/docs-nqaf/eurostat-esqr_final.pdf
Version 2019 : <https://ec.europa.eu/eurostat/documents/64157/4392716/ESS-QAF-V1-2final.pdf/bbf5970c-1adf-46c8-afc3-58ce177a0646>

²⁵ See: www.esener.eu

²⁶ <https://osha.europa.eu/en/highlights/eu-survey-reveals-key-and-emerging-workplace-risks>

²⁷ See : https://employment-social-affairs.ec.europa.eu/policies-and-activities/rights-work/health-and-safety-work/strategic-policy-documents_en

²⁸ <https://www.europeansurveyresearch.org/conference/utrecht-2025/>

²⁹ <https://www.eui.eu/Research/Library/ResearchGuides/Economics/Statistics/DataPortal/ESENER>

report "Conceptualising work-related psychosocial risks - Current state of the art and implications for research, policy and practice". The non-profit organisation "ADAPT International" equally references the ESENER data³⁰.

- Collaborative research: ESENER data have been used in joint publications with other EU agencies and institutions, such as:
 - "Towards age-friendly work in Europe: a life-course perspective on work and ageing from EU Agencies", a collaboration between EU-OSHA, European Foundation for the Improvement of Living and Working Conditions (Eurofound), the European Centre for the Development of Vocational Training (CEDEFOP), and the European Institute for Gender Equality (EIGE), which combines insights from ESENER with other surveys like the European Working Conditions Survey (EWCS)³¹.
 - "Digitalisation and workers wellbeing: The impact of digital technologies on work-related psychosocial risks", a joint publication by EU-OSHA and the Joint Research Centre (JRC)³².

By providing multiple avenues for accessing both the raw data and analysed results, EU-OSHA aims to maximise the impact and utility of the ESENER 2024 survey, supporting evidence-based decision-making and research in workplace health and safety across Europe.

This report focuses on the quality criteria most pertinent to ESENER 2024 at the time of writing. Some ESS standard criteria, such as "Accessibility and Clarity", are not addressed in detail here. These aspects, which relate to external data access and availability of supporting information, will become more relevant after EU-OSHA releases the ESENER 2024 dataset and documentation to the public, as was done with previous survey waves. At this stage, it is premature to evaluate how easily external researchers can access and understand the survey information. Such an assessment falls outside the scope of the current quality report.

³⁰ <https://englishbulletin.adapt.it/takeaways-from-the-esener-2024-report-regulatory-complexity-and-low-worker-participation-hinder-new-safety-risk-management/>

³¹ <https://osha.europa.eu/en/publications/towards-age-friendly-work-europe-life-course-perspective-work-and-ageing-eu-agencies>

³² <https://osha.europa.eu/en/publications/digitalisation-and-workers-wellbeing-impact-digital-technologies-work-related-psychosocial-risks>

7 Respondent burden

Respondent burden: “Resources must be effectively used. Respondent burden should be proportional to the needs of users and not excessive for respondents. Respondent burden should be measured and targets set for its reduction over time.”

The impact on respondents can be estimated based on the average interview duration and the number of completed valid interviews. Across all countries, the typical survey completion time was 24 minutes, approaches what many consider the upper limit for acceptable telephone interviews with businesses. Significantly extending the survey length could potentially compromise response quality and is therefore not advisable.

While the survey primarily uses straightforward response scales (often simple yes/no options), the numerous question sets can be demanding for respondents. There is a risk that overly taxing participants' attention spans during a telephone interview might affect data quality, particularly towards the interview conclusion. It is worth noting that some questions could potentially benefit from shorter or simplified formulations. However, any such refinements would need to be carefully balanced against the survey's comprehensive nature and the need for trend comparability.

Table 8: Respondent burden in terms of interviewing time, by country

Country	Average interview duration (in minutes)	Country	Average interview duration (in minutes)
Austria	23	Latvia	25
Belgium	26	Lithuania	24
Bulgaria	24	Luxembourg	26
Croatia	25	Malta	28
Cyprus	21	Netherlands	25
Czechia	25	Poland	23
Denmark	23	Portugal	26
Estonia	26	Romania	26
Finland	24	Slovakia	24
France	21	Slovenia	24
Germany	21	Spain	22
Greece	18	Sweden	27
Hungary	22	Iceland	26
Ireland	19	Norway	22
Italy	25	Switzerland	33
TOTAL	24		

8 Data protection

Confidentiality, Transparency and Security: “The privacy of data providers (households, enterprises, administrations and other respondents), the confidentiality of the information they provide and its use only for statistical purposes must be absolutely guaranteed. Statistical authorities must produce and disseminate European statistics respecting scientific independence and in an objective, professional and transparent manner in which all users are treated equitably.”

Safeguarding data is a legal requirement and was assured to all participants at the outset of each interview. More specifically, interviewers were equipped with a set of sentences to provide further context to respondents on the ESENER survey and to warrant their anonymity:

- *‘The survey is conducted on behalf of the European Agency for Safety and Health at Work. The Agency is an autonomous body of the European Union that provides information to improve health and safety at work.’*
- *‘The questions are about health and safety policies and practices in your establishment.’*
- *‘Good health and safety at work is an increasingly important issue and is a key factor in the success of the European economy. Participation in the survey will help to provide better information and assistance to establishments. This contributes to improving safety measures and health protection of employees.’*
- *‘Results will be used to support workplaces and to improve legislation.’*
- *‘Details are available online at the esener.eu website. First results will be published there at the beginning of 2025.’*
- *‘We have your telephone number from [Sample source relevant for the country]’*
- *‘The personal data and responses will solely be used for research purposes and to produce anonymous, statistical research findings and insights. You will NOT be identifiable, directly or indirectly, in any published results.’*
- *‘If you would like to read the Privacy Notice beforehand you can access it online at https://survey.ipsos.be/Privacynotice_Esener2024.pdf’*

To maintain strict confidentiality, company name and telephone number information present in the sampling frame and survey responses were kept separated. All contact information (company name and telephone number) are to be erased, at the latest, by 18 March 2026; i.e. 12 months after project completion. This deletion is also valid for respondents who explicitly consented to potential follow-up studies.

Consent for future contact was sought through two questions:

- Q401: May we or another research institute contracted by the European Agency for Safety and Health at Work contact you again within the next two years if we should have any additional questions for a follow-up study based on your answers in this survey?
- Q402 (if agreeing to Q401): In order to re-contact you for this purpose, can I ask your name, email address and direct phone number please?

All participants were assured that analyses would be conducted in an aggregated manner, preventing identification of specific organisations. While the strict separation of contact details and survey data is crucial for this guarantee, it may not always suffice, as even anonymised data could potentially identify a particular establishment in some instances. This is particularly relevant for interviews conducted in economic sectors with very few establishments (e.g., large firms in niche industries within small economies).

Although sector data were collected at the NACE Rev.2 2-digit level, this granular differentiation will not be included in the dataset made available to external researchers. Instead, only the NACE Rev.2 1-digit level will be provided.

9 Conclusion

The ESENER 2024 survey was conducted with a strong focus on quality assurance throughout all stages of the project. This quality report has provided a comprehensive assessment of the survey's accuracy, relevance, coherence and comparability, timeliness, accessibility, respondent burden and data protection. While no survey is without its challenges, the rigorous quality assurance processes implemented throughout ESENER 2024 have ensured that the data remains robust and valuable for its intended purposes.

Key strengths of ESENER 2024 include:

- Consistent methodology applied across all 30 participating countries.
- Rigorous translation process to ensure comparability of national questionnaire versions.
- Robust sampling approach with careful consideration of coverage and representation.
- Extensive quality control measures during fieldwork and data processing.
- High degree of comparability with previous ESENER waves, enabling trend analyses.
- Timely delivery of results and commitment to making data accessible to researchers.

The quality assurance measures outlined in this report give confidence that the ESENER 2024 data is fit for purpose in informing evidence-based policymaking and research in the field of workplace health and safety. Ongoing assessment and refinement of survey methods will help to further enhance the quality of future ESENER waves.

10 ESENER 2024 Quality control plan

The ESENER 2024 Quality Control Plan was used throughout the project to monitor quality performance according to set performance indicators. The right column provides an update on the quality assessment and its outcomes.

Table 9: ESENER 2024 Quality control plan

#	ESS Quality criteria	TSE Error	Quality target (key indicators)	Quality actions	Documentation/ verification tool	Responsible partner	Quality action completed	Outcome of/update on the quality action - commentary
Task 1 - Questionnaire Revision and cognitive pre-test								
1	Relevance and timeliness	Measurement error Specification error Processing error	Review the questionnaire with content that is of relevance to EU-OSHA and its stakeholders now and for anticipated usage in the future, whilst minimising mode effects.	Review and adapt the ESENER 2019 questionnaire Consult OSH experts in Central Coordination Team (CCT) Consult with relevant stakeholders as appointed by EU-OSHA Ensure a CAWI version is suited for online completion	Source questionnaire (ESENER 2019)	Ipsos/EU-OSHA	√	The 2019 questionnaire was reviewed in detail and proposals for optimisation, including advise from OSH experts, were extensively discussed with EU-OSHA.
2	Accuracy; coherence and comparability		Questionnaire to be accessible to target audience	Conduct cognitive interviews in 3 countries to test the questionnaire in three countries/languages	Cognitive testing materials and report	Ipsos	√	A cognitive pre-test was conducted between 10 Nov and 4 Dec 2023 (15 cognitive interviews/country in PL, ES and DE). Two debriefing meetings and a cognitive testing report assessing the outcomes of the testing formed the

ESENER 2024 Quality report

								basis for finalisation of the master questionnaire.
3	Accuracy; Accessibility; Punctuality		No errors / technical issues detected in script once ready to start fieldwork	Central scripting for all countries - defining all requirements to prevent missing values and the entry of non-permitted values. Technical testing of scripted questionnaire in all languages including scenario testing (at least one per country) and dummy data flooding conducted by CCT. Checking log maintained with details of errors found	Checking logs maintained by Ipsos with errors documented and sign-off on corrections recorded	Ipsos	√	The master script was extensively tested and was approved before the extract (MRT) for translations was created. The translation overlay took place on 11 Mar 2024 and the local scripts were extensively tested before the pilot start. The post-pilot questionnaire and adapted local versions were extensively tested before the start of the main field.
4	Relevance & Timeliness		Questionnaire signed off at agreed date to facilitate scripting and other activities on time.	Timetable agreed	Final questionnaire Progress reports	Ipsos	√	The final master questionnaire before pilot was signed off on 15 Dec 2023 as per the milestone set for this. The final master questionnaire for the main field was signed off on 18 Apr 2024, slightly later than the initially planned (due to back and forth on reducing the questionnaire length) but still in time to finalise scripting and translation

ESENER 2024 Quality report

								adaptations before the main field.
Task 2 - National questionnaires (translation and pilot)								
5	Accuracy		Testing the survey instrument and approach in all countries to identify any problems with the questionnaire (understanding, language, length, as well as technical issues such as routing)	Pilot testing of survey instrument conducted according to best practice principles and results used to inform subsequent development of the survey instrument that will facilitate comparable data collection in all countries	Pilot report and dataset Updated questionnaire and CATI/CAWI script for main stage fieldwork	Ipsos	√	A pilot was conducted between 18-29 Mar 2024; pilot data and a pilot report were submitted on 8 and 9 Apr 2024. Based on the pilot outcomes changes to the questionnaire were discussed and the master questionnaire and script were updated accordingly. The translations were adapted by cApStAn and again overlaid in the script. The updated local scripts were again tested before the main fieldwork start.
6	Accuracy; Coherence and comparability	Measurement error	Clear process for monitoring the translation and administrating the translation documents is set in place	Briefing materials for translators agreed which details process All linguists and translators attend briefing	Translation briefing materials Translation report with log of linguists in attendance	Ipsos/cApStAn	√	Translation, Reconciliation/Adjudication (REC/ADJ) and adaptation training materials were shared. The translation, REC/ADJ and adaptation training sessions were provided and all the involved staff attended the trainings as required and a log of this was shared.

ESENER 2024 Quality report

								EU-OSHA joined the trainings and recordings of the trainings were shared.
7	Accuracy; Coherence and comparability		Pre-identification of potential translation issues identified and addressed	Conduct Translatability Assessment	Translatability Assessment report	Ipsos/cApStAn	√	In Nov 2023, a Translatability Assessment (TA) was conducted. The resulting report was shared to inform recommendations for finalising the questionnaire. Ipsos/ cApStAn discussed the findings of both the TA and the pre-testing with EU-OSHA in detail.
8	Accuracy; Coherence and comparability		Translate questionnaire and fieldwork materials accurately and consistently following best practice procedures.	Translations of questionnaire follow full TRAPD procedure and other materials translated and verified Translations reviewed and approved by EU-OSHA	National questionnaires and fieldwork materials Translation report	Ipsos/cApStAn	√	The entire TRAPD process was implemented for the questionnaire. First-line translations and adapted versions were reviewed by EU-OSHA and the EU-OSHA focal points before the translation overlay on 11 Mar 2024, except for the Luxembourgish version and Russian for Lithuania. The feedback on these two versions were incorporated after the pilot.

ESENER 2024 Quality report

								The final translations were made available as part of the third interim report.
9	Accessibility		Documentation of the translation process	Full documentation of each stage of the translation from briefing through to delivery of the final versions	Translation report and translation files	Ipsos/cApStAn	√	A translation report and TAAFF files with the final translations including comments and feedback for each step were made available as part of the third interim report.
10	Accuracy		Reach 30 pilot interviews country	Foresee enough time for the fieldwork Follow the calling and contact procedures to maximise the response rate Foresee enough interviewers	Fieldwork progress report Microdata file Pilot report	Ipsos/Fieldwork centres	√	30 or more pilot interviews were obtained in all countries except for Norway where 26 interviews were achieved. A pilot report and pilot data were submitted on 8 and 9 Apr 2024.
11	Relevance; Accessibility and clarity		Deliver comprehensive pilot report to EU-OSHA that addresses all evaluation objectives	Agree on a pilot report outline Review the input for the report from all levels against the pilot objectives	Pilot report and EU-OSHA feedback on report	Ipsos/Fieldwork centres	√	A pilot report describing the pilot findings and recommendation for optimisation of the questionnaire, the FW materials and the field protocol were submitted on 9 Apr 2024. EU-OSHA provided feedback on the pilot report.

ESENER 2024 Quality report

12	Accuracy		Agree on a solution for all issues encountered in the pilot report	Propose concrete solutions for any issues, verified for feasibility and impact Discuss issues and solutions with EU-OSHA in post-pilot meeting List agreed solutions in the final report for Work Package A	Final WP A report	Ipsos/Fieldwork centres	√	The pilot findings were discussed in detail during the pilot meeting on 8 Apr 2024. A list of questionnaire agreed changes and solutions was included in the third interim report of WP A.
13	Accuracy		No technical issues with the Dimensions survey system	Full check of the system via dummy data and testing of the survey links before the pilot starts, in all languages	Script and dummy data check results Pilot report	Ipsos	√	The master and local scripts were extensively tested before the start of the pilot. No technical issues with the scripts were encountered during the pilot.
14	Relevance		Complete interviews in the three establishment size strata and across broad sector stratification groupings	Foresee a large enough pilot gross sample Pre-target the sample to ensure a good spread over the strata	Microdata file Pilot report	Ipsos/Fieldwork centres	√	Pilot interview in the broad sector and size groupings were obtained.
15	Coherence and comparability		Achieve consistency and accuracy in all national questionnaires for translation changes needed after the pilot	Review of all changes that require translation revisions/additions by the translation teams	Final WP A report Feedback from translation teams	Ipsos/cApStAn	√	Agreed post pilot changes to the questionnaire were systematically implemented in all local versions and reviewed by cApStAn.
16	Accuracy		Monitor at least 10% of the interviews via listening-in or recordings	Agree with national fieldwork centres on monitoring procedures. Verify local monitoring in the datafile by the core team	Fieldwork paradata Pilot report	Fieldwork centres	√	More than 10% of the interviews in all countries were monitored during the pilot.

ESENER 2024 Quality report

Task 3 - Design and implementation of sampling								
17	Accuracy	Coverage error Sampling error Non -response error Inferential error	Percentage of countries for which the sampling frame covers at least 95% of the target population	Sampling templates prepared comparing frame coverage	Sampling templates and summary in overall sampling strategy	Ipsos	√	>95% coverage confirmed in 9 out of 30 countries, but likely reached in others given comparing company-level frames with establishment-level statistics. To maximise coverage, Ipsos evaluated ESENER 2019 and alternative frame options comprehensively across countries. Coverage was compared with ESENER 2019 and in most instances was comparable or enhanced.
18	Accuracy & Timeliness		Sampling templates and overall sampling strategy agreed on time and provide sufficient and accurate details on sample quality and implementation	Agree initial sampling strategy with EU-OSHA Timely and comprehensive evaluation of sampling frame options	Sampling templates and overall sampling strategy	Ipsos	√	Evaluation of sampling frames in all countries were shared with EU-OSHA. A final selection of sampling frames was discussed and agreed with EU-OSHA. An updated sampling strategy was provided as part of the second interim report. An update to the sampling strategy was provided as

ESENER 2024 Quality report

								part of the third interim report.
19	Timeliness		Gross sample for the mainstage provided to national agencies at agreed date	Access requirements and timings fully investigated, requests made in time	Sampling templates	Ipsos and national agencies	√	The gross sample for all countries was acquired timely before and during fieldwork and was released in batches to the local field teams.
20	Accuracy		Percentage of countries where the distributions across stratification categories of the net sample closely approximates the distributions of the universe (sampling plan) (deviations in the proportional size of each of the strata between the two should not exceed 5 percentage points)	Agree realistic sampling targets with EU-OSHA, set gross sample sizes factoring in previous survey outcomes Monitor fieldwork according to the sample management plan Implement changes to the design if necessary	Fieldwork progress reports Technical report	Ipsos	√	Sample targets were discussed and agreed with EU-OSHA. Available gross sample and achieved sample composition was closely monitored during the fieldwork. In all countries the achieved sample (by sector*size) reflected the universe closely. The Technical report describes the sampling plan, the selected reference statistics and the sample performance.
21	Accuracy		Net sample size >= planned sample size in all countries	Monitor fieldwork Provide large enough gross sample size Adapt the sampling strategy	Final dataset	Ipsos	√	The sample size targets were (over)achieved in all countries.
Task 4 - Fieldwork preparation								

ESENER 2024 Quality report

22	Coherence and comparability	Measurement error Non-response error	Set up a survey system that gathers all survey data, paradata, sample data and quality data in a uniform file over all countries	Use a single and central survey system (Dimensions) that the CCT and the national fieldwork centres are familiar with and can use Test the system thoroughly via scripting and dummy data checks to ensure correct gathering of the data and consistency between all data types	Microdata files	Ipsos	√	A centralised, comprehensive survey system, thoroughly tested, was implemented for both pilot and main field across all countries, ensuring uniform data collection.
23	Accuracy		Design detailed calling and contact procedures and a monitoring system to follow up on them	Brief national fieldwork centres on calling and contact procedures (before pilot and before main field) Agree procedures with EU-OSHA Develop data checking syntaxes to check compliance via the contact data	National fieldwork centre briefing manual Fieldwork contact data Daily fieldwork progress reports	Ipsos	√	Detailed calling and contact procedures were implemented, with local teams trained accordingly. A monitoring system was established to follow up on compliance by the interviewers.
24	Accuracy		Train the fieldwork staff and interviewers so that they are fully informed about the survey objectives and procedures	Update the fieldwork manual from ESENER 2019 to ESENER 2024 (to be approved by EU-OSHA) Organise extensive briefings for the senior fieldwork staff (with EU-OSHA participation) and interviewer trainings both before pilot and main field. Update briefing manual after the pilot and if needed during the fieldwork with new information	Briefing manual Briefing and training presentation Briefing and training exercise and test interview results	Ipsos/Fieldwork centres	√	The local field teams were trained via train the trainer approach (in-person main field seminar for local project managers and key supervisors followed by local trainings which included test interviews).

ESENER 2024 Quality report

25	Accuracy; Accessibility and clarity		Design usable, complementary and comprehensive fieldwork materials for training and monitoring	Agree with EU-OSHA on the content of the fieldwork training materials, and have those signed- off by EU-OSHA Develop monitoring reporting tools for the CCT and EU-OSHA, to be tested during the pilot fieldwork	Briefing manual Briefing and training presentation Fieldwork progress reports	Ipsos	√	A detailed survey manual and interviewer instructions were provided to the local teams.
26	Accuracy		Build an error-free questionnaire script combining CATI and CAWI in all languages	Automatic and manual testing of the script by the scripting team, the core team and the national fieldwork centres, before the pilot test and before the main fieldwork	Dummy data test Script tests Scripting log	Ipsos	√	The CATI and CAWI script was thoroughly tested via automatic and manual procedures before the pilot and main field.
Task 5 - Fieldwork execution								
27	Accuracy	Coverage error Sampling error Non-response error Measurement error	Reach agreed percentage of local monitoring according to agreed spread over parts of the interview	Brief national fieldwork centres on monitoring rules. Follow up on percentage of local monitoring via daily fieldwork checks	Fieldwork quality data Fieldwork progress reports	Fieldwork centres	√	The local field teams were briefed in detail on the monitoring rules during the training seminars and via the survey manual. The local teams and the central team monitored the field closely via interview listening-in and data quality checks. EU-OSHA received a fieldwork report covering progress and quality of the field on a weekly basis. The agreed percentage of local monitoring

ESENER 2024 Quality report

								(spread over the different parts of the interview) was reached in all countries.
28	Accuracy		Achieve high quality data	Perform multiple fieldwork and data checks at the CCT and local level to identify data quality issues Gather all quality check output in a single overview, combining information to identify issues	Fieldwork quality data Fieldwork progress reports Quality control report	Ipsos/Fieldwork centres	√	Rigorous quality control measures were implemented throughout the fieldwork to ensure data integrity and interviewer performance. These measures included automated data quality checks (of all completed interviews) and comprehensive interviewer performance monitoring. Interviews flagged for potential low quality were reviewed by local teams and removed from the data file if deemed insufficient in quality.
29	Accuracy; Relevance		Maximise response rates among all sample strata	Design calling and contacting rules to maximise reach and response rate	Technical report Fieldwork progress reports	Ipsos/Fieldwork centres	√	Specific calling rules were designed and local teams were briefed in detail on these. The local teams and the central team monitored on a daily basis adherence to the calling rules as well as the

ESENER 2024 Quality report

								eligibility and response rates. EU-OSHA received weekly fieldwork reports including information on countries' sample compositions.
30	Accuracy; Coherence and comparability		Full coding of NACE categories	Brief and train interviewers on the coding of NACE Central double-coding of 10% of the open ends to verify the quality of the coding	Technical report	Ipsos/Fieldwork centres	√	Supervisors and interviewers were thoroughly trained on the coding of NACE during the training seminars. The questionnaire was updated for the main field to allow interviewers to select NACE Rev.2 codes (2-digit level) via a drop-down menu during the survey. If agreement could not be reached on the NACE category, the interviewer noted the sector for later coding by the central team. If the respondent agreed with the NACE classification from the sampling frame, the drop-down menu was not selected.
31	Timeliness & punctuality		End the fieldwork in the foreseen time	Monitor the fieldwork progress and response rates daily Add interviewers to the field force if progress is under target	Daily fieldwork report	Ipsos	√	The local teams and the central team monitored on a daily basis field

ESENER 2024 Quality report

								progress and eligibility and response rates. All countries completed their fieldwork by the designated deadline.
32	Accuracy		Follow the contacting and calling procedures	Perform daily checks on the contact data to verify compliance with the calling rules	Fieldwork contact data Daily fieldwork report	Ipsos/Fieldwork centres	√	The local teams and the central team monitored adherence to the calling rules on a daily basis.
33	Accuracy		Maximise the number of fully worked sample	Centrally manage sample release to make sure sample is worked fully before new sample is released Manage sample batch sizes in such a way that open sample is minimised at the end of the fieldwork	Fieldwork contact data Daily fieldwork report Technical report	Ipsos/Fieldwork centres	√	The local teams and the central team monitored continuously whether all numbers contacted received the required number of call attempts until a final contact outcome (e.g. completed interview, refusal) was reached. It was also checked whether the call attempts were spread over the times of the day and the days of the week. Fresh sample was only released when the earlier provided sample was nearly fully worked through, or towards the end of fieldwork, when additional sample was needed to finish fieldwork on time.

ESENER 2024 Quality report

34	Accuracy; Accessibility and clarity		Provide comprehensive, transparent and correct weekly fieldwork reports	Agree on content and structure of the weekly fieldwork reports with EU-OSHA Automate content of the report to avoid errors due to manual data handling Review reports before submission to EU-OSHA for accuracy and to highlight key findings	Fieldwork reports	Ipsos	√	Ipsos provided a weekly field report covering several aspects of the field (including overall progress, completes per sector, size and establishments, quality concerns...)	
35	Accuracy; Timeliness and punctuality		Deliver the interim data timely and correctly	Set fieldwork progress targets with the fieldwork centres to meet the agreed timing for the interim data delivery Prepare cleaning and validation syntaxes ahead to facilitate quick data delivery Perform in-depth data review before interim data delivery	Interim microdata	Ipsos	√	Interim progress milestones were set for the field agencies. Field progress was followed up on a daily basis. Interim data files were extracted at regular intervals and subjected to comprehensive quality control, in order to ensure efficient and accurate final data delivery upon completion of the fieldwork. Customised syntaxes were developed for these quality control.	
Task 6 - Data processing and delivery									
36	Accuracy & accessibility; Coherence & comparability; Consistency	Processing error	Achieve consistency and accuracy in data files per country and overall by following logic and plausibility checks	Data coding, entry and processing checks set up. Ongoing process of monitoring, cleaning and validating the mainstage data; systematic automated checks implemented at	Final SPSS dataset	Ipsos	√	Ipsos implemented a combination of an automated and manual data quality checking system; incoming interviews were checked on a number of aspects:	

ESENER 2024 Quality report

				country level executed on a regular basis.				routing checks, permitted values, speeding, straight-lining, item non-response, vague verbatim; interviews flagged for one or more of these aspects were subject to further local and central review. Interviews that did not pass the quality standards were not retained in the final datafile.
37	Accuracy & accessibility; Coherence & comparability; Consistency		Data editing and cleaning documented with respect to quality criteria via the provision of SPSS syntax code used for quality checks.	Workflow with quality control checks specified at the outset; data reflects agreed structure/data map	SPSS syntax code	Ipsos	√	Ipsos created the necessary SPSS syntaxes for data quality checks, data editing and data validation. Syntaxes for data recoding were provided to EU-OSHA.
38	Accuracy & accessibility; Coherence & comparability; Consistency		A complete anonymised data file in electronic format (SPSS compatible files) to be delivered, with all the correct variable and value names and labels (in English)	Structure of data file (variable names, variable labels, value labels etc.) and data map agreed with EU-OSHA in advance One central master questionnaire and data map file used throughout the project with all information on the questionnaire programming, data structure and coding	Final SPSS dataset Questionnaire/data map	Ipsos	√	A final quality-controlled and anonymised data set according to the agreed data mapping was provided on 31 Oct 2024 and approved by EU-OSHA.

ESENER 2024 Quality report

39	Accuracy	Coverage error Sampling error Non-response error Inferential error	Weighting approach developed including all relevant dimensions - design weights, calibration weights – using generalised regression estimators	Reflect sampling design in weighting Collect/estimate accurate reference statistics Agree with EU-OSHA on the approach	Technical report	Ipsos	√	In line with the sampling design, the weighting approach (including all relevant dimensions – design weights, calibration weights – using generalised regression estimators) was developed, discussed and agreed with EU-OSHA. Reference statistics were collected and documented. The weighting approach and reference statistics are detailed in the Technical report.
40	Accuracy		Weights calculated following the developed approach in all countries	Document weighting syntax Check weighting steps and results	Technical report	Ipsos	√	Weights were calculated according to the agreed approach in all countries. The weighting approach and the weighting efficiencies are detailed in the Technical report.
41	Coherence and comparability		All weighting factors included in the dataset	Document weighting syntax Document weighting steps	Final dataset	Ipsos	√	The final dataset includes all foreseen weighting variables. The weighting approach and the weighting efficiencies are detailed in the Technical report.

ESENER 2024 Quality report

42	Accuracy		Analysis showing the effects of weighting on estimates provide sufficient detail to evaluate the weights	Use of reference statistics for universe definition (sampling and weighting) Set target variables for sampling and weighting Comparison of targets and achieved sample (weighted and unweighted) Detailed sampling and weighting description and evaluation Discuss results with EU-OSHA	Technical report	Ipsos	√	The planned inputs were provided in the form of detailed Excel sample comparison tables with additional information in the Technical report. The results were discussed with EU-OSHA.
43	Accessibility		Technical report provide sufficient details on weighting implementation	Weighting approach and its implementation fully explained Weighting efficiency reported	Technical report	Ipsos	√	The Technical report includes a chapter explaining the weighting approach and detailing the weighting efficiencies.
Reporting								
44	Relevance	Inferential error	Deliver all reports according to the agreed outline and objectives	Agree with EU-OSHA on the outline of all reports and match the outline to the project's objective	Report outlines Draft and final reports	Ipsos	√	Outline of the Inception and Interim reports as well as the Technical and the Quality reports were agreed and Ipsos delivered accordingly.
45	Accuracy		Deliver reports error-free	Do number checks, consistency checks, lay-out/design checks and language checks by a native English speaker on all reports	Internal report review Draft and final reports	Ipsos	√	The reports were checked and proofread before delivery.

ESENER 2024 Quality report

46	Accessibility and clarity		Deliver reports that are clear and are ready for public dissemination	Agree with EU-OSHA on the objectives of each report and adjust style and language to the envisaged public Clarify content where necessary through source references, glossaries, explanations of acronyms etc.	Internal report review Draft and final reports	Ipsos	√	Ipsos submitted reports that were close to ready for public dissemination using the required templates and agreed formatting.
Project management								
47	Timeliness & punctuality	N/A	All activities started and completed on time and all deliverables submitted to EU-OSHA on time	Clearly defined timetable that identifies key stages, tasks, responsibilities and allows for contingencies Clear review and turnaround timings agreed between EU-OSHA and Ipsos	Project timetable signed off and closely monitored by Project Manager Confirmation of timely delivery/reaching milestone per subtask/deliverable	Ipsos	√	A detailed project timetable, including responsibilities, was established, was kept up to date and shared with all project partners and EU-OSHA. While there was some delay in the set-up and recruitment for the cognitive pre-test and the subsequent debriefs, the milestones for the next main steps (scripting, translation) were kept at the initial timings.

ESENER 2024 Quality report

48	Accuracy		No gaps or redundancies in task assignments and responsibilities among teams	Clear responsibilities formulated for each team member, both core team and any network partners	Task and responsibilities overview finalised at the start of the project and shared with the whole project team Service agreements between Ipsos and all network partners	Ipsos	√	Task and responsibilities overview was shared and the project team worked according to plan. Replacement for two staff members in the central team was proposed for approval by EU-OSHA and was accepted. In the local field teams, in total 13 staff members needed to be replaced. The reasons for replacement were shared and new members were proposed and approved by EU-OSHA. Detailed service agreements were put in place with the local teams in Nov 2023.
49	Accuracy		All work is supervised and all deliverables are reviewed	Clear project team hierarchies, with the senior project staff (lead project manager, deputy project manager, quality manager and operations & field manager supervising all work done) Sign-off procedures for all client-facing deliverables	Table with task lead and task supervisors for each task Written sign-off for all client-facing deliverables	Ipsos	√	Project team hierarchies were established and review/sign-off system was in place.
50	Accuracy		All staff have the required experience and expertise	Review of all staff experience via CVs	Staff CVs	Ipsos	√	CVs were submitted in proposal phase.

ESENER 2024 Quality report

								Replacement for two staff members in the central team and their CVs was proposed for approval by EU-OSHA and was accepted. In the local field teams, in total 13 staff members needed to be replaced. The reasons for replacement were shared and new members were proposed and approved by EU-OSHA.
51	Accuracy; Timeliness and punctuality		Enough staff resources are assigned at each stage of the project to allow timely and high-quality work, both in the core team and the network partners	Develop full staff allocation plan before the start of the project with specific number of hours allocated per task and per team member	Resource allocation sheet for full project	Ipsos	√	Full staff allocation plan was in place and was followed up during the project.

11 Annex

11.1 Multi-variate logit regression model Q250

Key findings from the logistic regression output for Q250 (Workplace risk assessment regularly carried out).

1. Model Fit:

- The Omnibus Tests show that the model is statistically significant ($p < 0.001$), indicating that the predictors, as a set, reliably predict the outcome.
- The Nagelkerke R Square of 0.298 suggests that approximately 29.8% of the variation in the outcome is explained by the predictors.
- The model correctly classifies 78.8% of cases overall, with better prediction for "Yes" responses (93.4%) than "No" responses (34.7%).

2. Statistically significant predictors:

a) Country: There are significant differences between countries. For example:

- Spain ($OR = 2.796$, $p < 0.001$) has higher odds of regular workplace risk assessment compared to Germany (reference).
- Luxembourg ($OR = 0.094$, $p < 0.001$) has much lower odds compared to Germany.

b) Company Size:

- Larger companies are more likely to conduct regular risk assessments.
- 250+ employees ($OR = 3.769$, $p < 0.001$) have the highest odds compared to 5-9 employees.

c) Sector (NACE Group):

- Sector C (Manufacturing) ($OR = 1.349$, $p < 0.001$) and Sector Q (Human health and social work) ($OR = 1.306$, $p < 0.001$) have higher odds compared to the reference group (NACE G, H, I, R).

d) Function of Respondent:

- Managers with specific OSH tasks ($OR = 1.394$, $p < 0.001$) and OSH Specialists ($OR = 1.314$, $p < 0.001$) report higher odds of regular risk assessments.

e) OSH Expertise:

- Having OSH expertise available is associated with lower odds ($OR = 0.339$, $p < 0.001$) of regular risk assessments.

f) Employee Representation:

- Both types of employee representation are associated with lower odds of regular risk assessments compared to no representation.

g) Risk Profile:

- Generally, as the number of traditional risks increases, the odds of regular risk assessments increase.
- For psychosocial risks, the relationship is not as clear, but there are some significant associations.

h) Labour Inspectorate Visits:

- Establishments where labour inspectorate visits are not applicable have higher odds ($OR = 1.789$, $p < 0.001$) of regular risk assessments.

3. Non-significant Predictors:

- The mode of survey administration (CATI vs. CAWI) does not significantly affect the outcome.

Table 10: Mode effect regression model Q250 « Risk Assessment conducted »

Q250 « Risk Assessment conducted »	Level of significance ³³	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio - Lower	Confidence interval odds ratio - Upper
Interview Mode (Reference: CATI)				
CAWI	0.342	1.073	0.928	1.240
Country (Reference: Germany)				
Austria	<0.001	0.194	0.150	0.252
Belgium	<0.001	0.234	0.179	0.306
Bulgaria	0.119	0.782	0.574	1.065
Switzerland	<0.001	0.152	0.118	0.194
Cyprus	<0.001	0.180	0.112	0.289
Czech Republic	<0.001	0.418	0.315	0.555
Denmark	<0.001	0.212	0.170	0.266
Estonia	0.077	0.621	0.366	1.053
Greece	<0.001	0.457	0.351	0.595
Spain	<0.001	2.796	2.149	3.638
Finland	0.822	0.960	0.677	1.364
France	<0.001	0.186	0.148	0.233
Croatia	0.011	0.613	0.420	0.894
Hungary	<0.001	0.412	0.314	0.539
Ireland	<0.001	0.582	0.431	0.786
Iceland	<0.001	0.168	0.084	0.336
Italy	<0.001	1.601	1.249	2.053
Lithuania	<0.001	0.413	0.290	0.590
Luxembourg	<0.001	0.094	0.057	0.154
Latvia	0.568	0.884	0.580	1.349
Malta	0.015	0.434	0.221	0.850
The Netherlands	<0.001	0.568	0.439	0.735
Norway	0.900	0.980	0.719	1.337
Poland	<0.001	0.639	0.501	0.815
Portugal	0.286	0.860	0.653	1.134

³³ Interpretation significance level: low (p<0.05); medium (p<0.01); high (p<0.005)

ESENER 2024 Quality report

Romania	0.032	0.728	0.545	0.973
Sweden	0.561	0.921	0.698	1.216
Slovenia	0.094	1.656	0.917	2.990
Slovakia	<0.001	0.395	0.288	0.542
Size class (Reference: 5-9 employees)				
10 to 49 employees	<0.001	1.379	1.306	1.456
50 to 249 employees	<0.001	2.695	2.370	3.064
250 employees or more	<0.001	3.769	2.569	5.530
NACE Group (Reference: NACE G,H,I,R)				
NACE A	0.215	1.123	0.935	1.348
NACE B,D,E,F	0.098	1.083	0.986	1.189
NACE C	<0.001	1.349	1.225	1.486
NACE J,K,L,M,N,S	0.831	1.007	0.942	1.077
NACE O	0.028	0.844	0.726	0.982
NACE P	0.002	1.192	1.065	1.335
NACE Q	<0.001	1.306	1.188	1.435
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	<0.001	0.877	0.818	0.941
Manager with specific OSH tasks	<0.001	1.394	1.213	1.603
OSH Specialist without managing function	<0.001	1.314	1.177	1.467
Employee representative in charge of OSH	0.063	1.136	0.993	1.299
Another employee in charge of the subject	0.682	0.984	0.910	1.064
External OSH consultant	0.526	1.108	0.807	1.522
NA on Q113	0.631	1.055	0.847	1.314
Q050/Q100. Type of organisation (Reference: Single site establishment)				
Multi-site establishment	<0.001	0.877	0.825	0.932
Q151. OSH expertise available (Reference: No OSH expertise available)				
OSH expertise available	<0.001	0.339	0.314	0.367

Q350. Employee representation in terms of OSH (Reference: No employee representation in terms of OSH)				
Only works council or trade union	<0.001	0.479	0.451	0.509
OSH representation	<0.001	0.491	0.441	0.548
Q200. Risk profile - Number of traditional risks (Reference: No traditional risks)				
One	<0.001	0.297	0.234	0.377
Two	<0.001	0.290	0.233	0.360
Three	<0.001	0.376	0.304	0.465
Four	<0.001	0.411	0.332	0.508
Five	<0.001	0.479	0.388	0.592
Six	<0.001	0.560	0.452	0.693
Seven	<0.001	0.596	0.480	0.739
Eight	<0.001	0.632	0.508	0.787
Nine	0.018	0.760	0.605	0.954
Ten	0.183	0.848	0.665	1.081
Q201. Risk profile - Number of psychosocial risks (Reference: No psychosocial risks)				
One	<0.001	1.635	1.281	2.088
Two	0.011	1.366	1.073	1.739
Three	0.004	1.427	1.120	1.818
Four	0.131	1.208	0.945	1.543
Five	0.527	1.088	0.838	1.411
Q154. Visit from labour inspectorate (Reference: Not visited)				
Visited	<0.001	1.993	1.612	2.463
NA labour inspectorate visit	<0.001	1.939	1.566	2.401
Constant	<0.001	0.093		

11.2 Multi-variate logit regression model Q355_1

Key findings from the logistic regression output for Q355_1 (Employee training on the use of working equipment)

1. Model Fit:

- The Omnibus Tests show that the model is statistically significant ($p < 0.001$), indicating that the predictors, as a set, reliably predict the outcome.
- The Nagelkerke R Square of 0.173 suggests that approximately 17.3% of the variation in the outcome is explained by the predictors.
- The model correctly classifies 70.4% of cases overall, with better prediction for "Yes" responses (88.3%) than "No" responses (35.2%).

2. Statistically significant predictors:

a) Mode:

- CAWI mode has slightly higher odds ($OR = 1.181$, $p = 0.005$) of reporting employee training compared to CATI.

b) Country: There are significant differences between countries. For example:

- Ireland ($OR = 2.268$, $p < 0.001$) and Malta ($OR = 2.145$, $p = 0.042$) have higher odds of employee training compared to Germany (reference).
- France ($OR = 0.241$, $p < 0.001$) and Romania ($OR = 0.286$, $p < 0.001$) have much lower odds compared to Germany.

c) Company Size:

- Larger companies are more likely to provide employee training.
- 250+ employees ($OR = 1.616$, $p < 0.001$) have the highest odds compared to 5-9 employees.

d) Sector (NACE Group):

- Sectors J,K,L,M,N,S ($OR = 0.881$, $p < 0.001$) and sector P (Education) ($OR = 0.605$, $p < 0.001$) have lower odds of providing training compared to the reference group (NACE G, H, I, R).

e) Function of Respondent:

- "Another employee in charge of the subject" ($OR = 0.891$, $p < 0.001$) reports lower odds of employee training.

f) OSH Expertise:

- Having OSH expertise available is associated with lower odds ($OR = 0.612$, $p < 0.001$) of employee training.

g) Employee Representation:

- Both types of employee representation are associated with lower odds of employee training compared to no representation.

h) Risk Profile:

- As the number of traditional risks increases, the odds of employee training generally increase.
- For psychosocial risks, higher numbers of risks are associated with higher odds of training.

i) Labour Inspectorate Visits:

- Establishments that were visited have lower odds ($OR = 0.804$, $p < 0.001$) of providing employee training compared to those not visited.

3. Non-significant Predictors:

- The type of organisation (single vs. multi-site) is not significantly associated with the outcome.

Table 11: Mode effect regression model Q355_1 « Employee training on the use of working equipment »

Q355_1 « Employee training on the use of working equipment »	Level of significance	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio - Lower	Confidence interval odds ratio - Upper
Interview Mode (Reference: CATI)				
CAWI	0.005	1.181	1.052	1.325
Country (Reference: Germany)				
Austria	<0.001	0.578	0.468	0.713
Belgium	<0.001	0.596	0.480	0.740
Bulgaria	0.079	0.810	0.640	1.025
Switzerland	0.433	0.923	0.755	1.128
Cyprus	0.038	1.688	1.030	2.766
Czech Republic	0.615	0.943	0.749	1.187
Denmark	0.002	0.764	0.644	0.906
Estonia	0.058	0.676	0.451	1.014
Greece	<0.001	1.585	1.264	1.987
Spain	<0.001	1.665	1.382	2.007
Finland	0.003	1.526	1.160	2.007
France	<0.001	0.241	0.202	0.287
Croatia	0.978	1.004	0.739	1.364
Hungary	0.396	0.908	0.726	1.135
Ireland	<0.001	2.268	1.716	2.999
Iceland	0.631	0.854	0.448	1.627
Italy	0.642	1.044	0.871	1.251
Lithuania	<0.001	0.285	0.215	0.379
Luxembourg	<0.001	0.317	0.202	0.498
Latvia	0.384	0.863	0.618	1.203
Malta	0.042	2.145	1.027	4.482
The Netherlands	<0.001	0.505	0.414	0.617
Norway	<0.001	1.664	1.298	2.135
Poland	<0.001	0.426	0.353	0.513
Portugal	0.323	1.114	0.899	1.382
Romania	<0.001	0.286	0.233	0.351
Sweden	0.840	1.022	0.825	1.267

ESENER 2024 Quality report

Slovenia	0.005	1.826	1.195	2.789
Slovakia	<0.001	1.855	1.373	2.505
Size class (Reference: 5-9 employees)				
10 to 49 employees	0.099	1.041	0.992	1.092
50 to 249 employees	<0.001	1.218	1.110	1.336
250 employees or more	<0.001	1.616	1.275	2.048
NACE Group (Reference: NACE G,H,I,R)				
NACE A	0.367	1.072	0.921	1.248
NACE B,D,E,F	0.394	1.036	0.955	1.124
NACE C	0.214	1.051	0.972	1.137
NACE J,K,L,M,N,S	<0.001	0.881	0.830	0.935
NACE O	0.016	0.850	0.745	0.970
NACE P	<0.001	0.605	0.552	0.664
NACE Q	0.318	0.959	0.883	1.041
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	0.047	0.937	0.879	0.999
Manager with specific OSH tasks	0.449	1.045	0.933	1.171
OSH Specialist without managing function	0.452	0.968	0.891	1.053
Employee representative in charge of OSH	0.924	1.005	0.902	1.120
Another employee in charge of the subject	<0.001	0.891	0.834	0.952
External OSH consultant	0.108	1.269	0.949	1.697
NA on Q113	0.179	1.145	0.940	1.395
Q050/Q100. Type of organisation (Reference: Single site establishment)				
Multi-site establishment	0.059	1.052	0.998	1.108
Q151. OSH expertise available (Reference: No OSH expertise available)				
OSH expertise available	<0.001	0.612	0.569	0.659
Q350. Employee representation in terms of OSH (Reference: No employee representation in terms of OSH)				

Only works council or trade union	<0.001	0.564	0.535	0.595
OSH representation	<0.001	0.579	0.525	0.640
Q200. Risk profile - Number of traditional risks (Reference: No traditional risks)				
One	<0.001	0.282	0.234	0.340
Two	<0.001	0.374	0.316	0.442
Three	<0.001	0.419	0.357	0.493
Four	<0.001	0.469	0.399	0.551
Five	<0.001	0.512	0.436	0.601
Six	<0.001	0.543	0.462	0.638
Seven	<0.001	0.618	0.524	0.728
Eight	0.002	0.766	0.648	0.905
Nine	0.016	0.807	0.679	0.960
Ten	0.005	0.770	0.643	0.923
Q201. Risk profile - Number of psychosocial risks (Reference: No psychosocial risks)				
One	<0.001	1.948	1.597	2.376
Two	<0.001	1.737	1.427	2.114
Three	<0.001	1.635	1.344	1.990
Four	0.003	1.357	1.112	1.656
Five	0.009	1.330	1.075	1.644
Q154. Visit from labour inspectorate (Reference: Not visited)				
Visited	<0.001	0.804	0.708	0.913
NA labour inspectorate visit	0.732	0.978	0.859	1.113
Constant	<0.001	4.168		

11.3 Multi-variate logit regression model Q355_3

The logistic regression output for Q355_3 (Employee training on prevention of psychosocial risks).

1. Model Fit:

- The Omnibus Tests show that the model is statistically significant ($p < 0.001$), indicating that the predictors, as a set, reliably predict the outcome.
- The Nagelkerke R Square of 0.160 suggests that approximately 16% of the variation in the outcome is explained by the predictors.
- The model correctly classifies 68% of cases overall, with better prediction for "No" responses (86%) than "Yes" responses (39%).

2. Statistically significant predictors:

a) Mode:

- CAWI mode has significantly higher odds ($OR = 1.551$, $p < 0.001$) of reporting employee training on psychosocial risks compared to CATI.

b) Country: There are significant differences between countries. For example:

- Spain ($OR = 2.553$, $p < 0.001$) and Norway ($OR = 1.733$, $p < 0.001$) have higher odds of employee training on psychosocial risks compared to Germany (reference).
- Czech Republic and Denmark (both $OR = 0.364$, $p < 0.001$) have much lower odds compared to Germany.

c) Company Size:

- Larger companies are more likely to provide employee training on psychosocial risks.
- 250+ employees ($OR = 2.684$, $p < 0.001$) have the highest odds compared to 5-9 employees.

d) Sector (NACE Group):

- Sector Q (Human health and social work) ($OR = 2.121$, $p < 0.001$) and sector P (Education) ($OR = 1.583$, $p < 0.001$) have higher odds of providing training on psychosocial risks compared to the reference group (NACE G, H, I, R).
- Sector C (Manufacturing) ($OR = 0.805$, $p < 0.001$) has lower odds.

e) Function of Respondent:

- OSH Specialists without managing function ($OR = 1.140$, $p < 0.001$) report higher odds of employee training on psychosocial risks.

f) Organisation Type:

- Multi-site establishments have lower odds ($OR = 0.797$, $p < 0.001$) of providing training on psychosocial risks.

g) OSH Expertise:

- Having OSH expertise available is associated with lower odds ($OR = 0.503$, $p < 0.001$) of employee training on psychosocial risks.

h) Employee Representation:

- Both types of employee representation are associated with lower odds of employee training on psychosocial risks compared to no representation.

i) Risk Profile:

- The relationship with traditional risks is not linear, but establishments with 7-8 traditional risks (out of maximum 10) have significantly lower odds of providing training on psychosocial risks.
- The number of psychosocial risks is not strongly associated with the likelihood of training.

j) Labour Inspectorate Visits:

- Establishments that were visited have lower odds (OR = 0.828, $p = 0.003$) of providing employee training on psychosocial risks compared to those not visited.

3. Non-significant Predictors:

- Several country comparisons and some categories of the risk profile variables are not statistically significant.

Table 12: Mode effect regression model Q335_3 « Providing employees with training on how to prevent psychosocial risks such as stress or bullying »

Q355_3 « Providing employees with training on how to prevent psychosocial risks such as stress or bullying »	Level of significance	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio - Lower	Confidence interval odds ratio - Upper
Interview Mode (Reference: CATI)				
CAWI	<0.001	1.551	1.385	1.736
Country (Reference: Germany)				
Austria	<0.001	0.611	0.500	0.747
Belgium	0.034	0.798	0.648	0.983
Bulgaria	<0.001	0.544	0.434	0.680
Switzerland	<0.001	0.654	0.539	0.793
Cyprus	0.501	0.863	0.561	1.326
Czech Republic	<0.001	0.364	0.291	0.455
Denmark	<0.001	0.364	0.310	0.427
Estonia	0.085	0.709	0.480	1.048
Greece	0.382	0.911	0.738	1.123
Spain	<0.001	2.553	2.154	3.025
Finland	0.224	1.154	0.916	1.453
France	<0.001	0.466	0.394	0.550
Croatia	0.009	0.692	0.525	0.912
Hungary	0.008	0.750	0.606	0.927
Ireland	0.010	1.353	1.074	1.703
Iceland	0.965	1.015	0.533	1.933
Italy	0.079	0.862	0.730	1.017
Lithuania	0.042	1.333	1.010	1.758
Luxembourg	<0.001	0.416	0.254	0.681
Latvia	0.089	1.316	0.959	1.804
Malta	0.202	1.439	0.823	2.518
The Netherlands	0.006	0.765	0.632	0.926

ESENER 2024 Quality report

Norway	<0.001	1.733	1.400	2.146
Poland	0.979	0.998	0.837	1.190
Portugal	0.181	0.873	0.715	1.065
Romania	<0.001	0.564	0.464	0.687
Sweden	0.256	1.122	0.920	1.369
Slovenia	0.015	1.523	1.085	2.139
Slovakia	0.001	0.659	0.512	0.850
Size class (Reference: 5-9 employees)				
10 to 49 employees	<0.001	1.154	1.101	1.209
50 to 249 employees	<0.001	1.480	1.361	1.609
250 employees or more	<0.001	2.684	2.205	3.267
NACE Group (Reference: NACE G,H,I,R)				
NACE A	0.011	0.835	0.727	0.959
NACE B,D,E,F	0.009	0.901	0.834	0.975
NACE C	<0.001	0.805	0.747	0.867
NACE J,K,L,M,N,S	<0.001	1.166	1.100	1.237
NACE O	0.025	1.157	1.019	1.313
NACE P	<0.001	1.583	1.445	1.734
NACE Q	<0.001	2.121	1.961	2.293
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	0.209	0.960	0.901	1.023
Manager with specific OSH tasks	0.618	0.973	0.876	1.082
OSH Specialist without managing function	<0.001	1.140	1.056	1.231
Employee representative in charge of OSH	0.060	1.101	0.996	1.217
Another employee in charge of the subject	0.312	0.967	0.907	1.032
External OSH consultant	0.814	0.967	0.728	1.283
NA on Q113	0.901	0.988	0.811	1.203
Q050/Q100. Type of organisation (Reference: Single site establishment)				
Multi-site establishment	<0.001	0.797	0.758	0.838

Q151. OSH expertise available (Reference: No OSH expertise available)				
OSH expertise available	<0.001	0.503	0.463	0.547
Q350. Employee representation in terms of OSH (Reference: No employee representation in terms of OSH)				
Only works council or trade union	<0.001	0.512	0.485	0.541
OSH representation	<0.001	0.552	0.498	0.612
Q200. Risk profile - Number of traditional risks (Reference: No traditional risks)				
One	0.733	1.029	0.871	1.217
Two	0.549	0.957	0.830	1.104
Three	0.656	0.970	0.846	1.111
Four	0.501	0.955	0.835	1.092
Five	0.592	1.037	0.907	1.187
Six	0.060	0.879	0.768	1.005
Seven	0.001	0.799	0.697	0.916
Eight	<0.001	0.753	0.655	0.865
Nine	0.080	0.880	0.763	1.015
Ten	0.098	0.882	0.760	1.023
Q201. Risk profile - Number of psychosocial risks (Reference: No psychosocial risks)				
One	0.826	0.979	0.808	1.185
Two	0.232	1.122	0.929	1.357
Three	0.353	1.094	0.905	1.322
Four	0.288	1.110	0.916	1.346
Five	0.337	1.106	0.901	1.357
Q154. Visit from labour inspectorate (Reference: Not visited)				
Visited	0.003	0.828	0.733	0.936
NA labour inspectorate visit	0.625	0.970	0.856	1.098
Constant	0.177	0.809		

11.4 Multi-variate logit regression model Q314

The logistic regression output for Q314 (Impact of digital technologies on OSH have been consulted on with employees).

1. Model Fit:

- The Omnibus Tests show that the model is statistically significant ($p < 0.001$), indicating that the predictors, as a set, reliably predict the outcome.
- The Nagelkerke R Square of 0.049 suggests that approximately 4.9% of the variation in the outcome is explained by the predictors, which is a relatively weak fit compared to the previous models.
- The model correctly classifies 67.3% of cases overall, with excellent prediction for "No" responses (97.3%) but very poor prediction for "Yes" responses (6.8%).

2. Statistically significant predictors:

a) Mode:

- CAWI mode has significantly higher odds ($OR = 1.362$, $p < 0.001$) of reporting consultation on the impact of digital technologies compared to CATI.

b) Country: There are significant differences between countries. For example:

- Lithuania ($OR = 1.824$, $p < 0.001$) and Slovakia ($OR = 1.419$, $p = 0.004$) have higher odds of consultation compared to Germany (reference).
- Bulgaria ($OR = 0.327$, $p < 0.001$) and Cyprus ($OR = 0.354$, $p < 0.001$) have much lower odds compared to Germany.

c) Sector (NACE Group):

- Sector P (Education) ($OR = 1.517$, $p < 0.001$) and Sectors J,K,L,M,N,S ($OR = 1.321$, $p < 0.001$) have higher odds of consultation compared to the reference group (NACE G, H, I, R).
- Sector C (Manufacturing) ($OR = 0.796$, $p < 0.001$) has lower odds.

d) Function of Respondent:

- OSH Specialists without managing function ($OR = 1.192$, $p < 0.001$), Managers with specific OSH tasks ($OR = 1.158$, $p = 0.005$), and managers without specific OSH tasks ($OR = 1.112$, $p < 0.001$) report higher odds of consultation compared to owners/managing directors.

e) OSH Expertise:

- Having OSH expertise available is associated with lower odds ($OR = 0.768$, $p < 0.001$) of consultation on digital technologies' impact.

f) Employee Representation:

- Both types of employee representation are associated with lower odds of consultation compared to no representation.

g) Risk Profile:

- Generally, establishments with more traditional risks have lower odds of consultation compared to those with no traditional risks.
- The number of psychosocial risks is significantly associated with consultation ($p < 0.001$ for the overall effect), but individual categories are not significant.

h) Labour Inspectorate Visits:

- Establishments where labour inspectorate visits are not applicable have higher odds ($OR = 1.175$, $p = 0.012$) of consultation.

3. Non-significant Predictors:

- Company size is not significantly associated with the outcome.
- Several country comparisons are not statistically significant.
- The effect of being a multi-site establishment is not statistically significant.
- The effect of being visited by labour inspectorate is not significant compared to not being visited.

The model's fit is relatively weak, suggesting that other factors not included in the model might be important in explaining this outcome.

Table 13: Mode effect regression model Q314 « Impact of digital technologies on OSH have been consulted on with employees »

Q314 « Impact of digital technologies on OSH have been consulted on with employees »	Level of significance	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio - Lower	Confidence interval odds ratio - Upper
Interview Mode (Reference: CATI)				
CAWI	<0.001	1.362	1.215	1.528
Country (Reference: Germany)				
Austria	<0.001	0.672	0.552	0.819
Belgium	0.751	0.968	0.790	1.185
Bulgaria	<0.001	0.327	0.256	0.416
Switzerland	0.148	0.872	0.725	1.050
Cyprus	<0.001	0.354	0.215	0.583
Czech Republic	<0.001	0.535	0.431	0.663
Denmark	<0.001	0.619	0.531	0.723
Estonia	0.756	0.942	0.644	1.377
Greece	<0.001	0.453	0.363	0.565
Spain	<0.001	0.607	0.514	0.717
Finland	<0.001	0.556	0.438	0.705
France	<0.001	0.687	0.585	0.807
Croatia	<0.001	0.469	0.350	0.629
Hungary	0.183	0.869	0.707	1.068
Ireland	0.362	0.900	0.719	1.128
Iceland	0.007	0.346	0.160	0.747
Italy	0.918	0.992	0.844	1.165
Lithuania	<0.001	1.824	1.392	2.391
Luxembourg	<0.001	0.360	0.212	0.612
Latvia	0.226	1.211	0.888	1.651
Malta	0.170	1.461	0.850	2.512
The Netherlands	0.950	0.994	0.826	1.196
Norway	<0.001	0.626	0.507	0.773

Poland	0.042	0.836	0.704	0.994
Portugal	0.011	0.773	0.635	0.942
Romania	0.820	1.022	0.846	1.236
Sweden	<0.001	0.545	0.445	0.667
Slovenia	0.154	1.275	0.913	1.783
Slovakia	0.004	1.419	1.116	1.805
Size class (Reference: 5-9 employees)				
10 to 49 employees	0.084	0.960	0.917	1.005
50 to 249 employees	0.942	1.003	0.923	1.090
250 employees or more	0.208	1.129	0.935	1.363
NACE Group (Reference: NACE G,H,I,R)				
NACE A	0.821	1.016	0.887	1.163
NACE B,D,E,F	0.144	0.944	0.875	1.020
NACE C	<0.001	0.796	0.739	0.858
NACE J,K,L,M,N,S	<0.001	1.321	1.248	1.399
NACE O	0.160	1.095	0.965	1.242
NACE P	<0.001	1.517	1.387	1.658
NACE Q	<0.001	1.223	1.131	1.321
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	<0.001	1.112	1.046	1.183
Manager with specific OSH tasks	0.005	1.158	1.045	1.284
OSH Specialist without managing function	<0.001	1.192	1.106	1.285
Employee representative in charge of OSH	0.114	1.083	0.981	1.195
Another employee in charge of the subject	0.631	0.984	0.923	1.050
External OSH consultant	0.579	1.080	0.824	1.414
NA on Q113	0.505	0.935	0.769	1.138
Q050/Q100. Type of organisation (Reference: Single site establishment)				
Multi-site establishment	0.143	0.964	0.917	1.013
Q151. OSH expertise available (Reference: No OSH expertise available)				

OSH expertise available	<0.001	0.768	0.711	0.829
Q350. Employee representation in terms of OSH (Reference: No employee representation in terms of OSH)				
Only works council or trade union	<0.001	0.678	0.643	0.715
OSH representation	<0.001	0.812	0.734	0.897
Q200. Risk profile - Number of traditional risks (Reference: No traditional risks)				
One	0.184	0.894	0.757	1.055
Two	0.029	0.855	0.743	0.984
Three	0.580	0.963	0.842	1.101
Four	0.009	0.839	0.734	0.958
Five	0.005	0.828	0.725	0.946
Six	0.005	0.826	0.723	0.944
Seven	0.008	0.832	0.727	0.952
Eight	<0.001	0.776	0.677	0.891
Nine	0.004	0.810	0.702	0.934
Ten	0.312	0.927	0.800	1.074
Q201. Risk profile - Number of psychosocial risks (Reference: No psychosocial risks)				
One	0.600	1.052	0.870	1.273
Two	0.160	1.145	0.948	1.381
Three	0.142	1.151	0.954	1.389
Four	0.394	1.087	0.898	1.315
Five	0.619	0.950	0.774	1.165
Q154. Visit from labour inspectorate (Reference: Not visited)				
Visited	0.693	1.025	0.906	1.161
NA labour inspectorate visit	0.012	1.175	1.036	1.332
Constant	<0.001	0.530		

11.5 Multi-variate logit regression model Q159

The logistic regression output for Q159 (Sickness absence rather increased over the last 3 years).

1. Model Fit:

- The Omnibus Tests show that the model is statistically significant ($p < 0.001$), indicating that the predictors, as a set, reliably predict the outcome.
- The Nagelkerke R Square of 0.062 suggests that approximately 6.2% of the variation in the outcome is explained by the predictors, which is a relatively weak fit.
- The model correctly classifies 86.4% of cases overall, but it is important to note that it predicts all cases as "No" (100% for "No" responses and 0% for "Yes" responses). This suggests the model might be biased towards the majority class.

2. Statistically significant predictors:

a) Country: There are significant differences between countries. For example:

- Luxembourg (OR = 3.061, $p < 0.001$), Belgium (OR = 2.335, $p < 0.001$), and Switzerland (OR = 2.232, $p < 0.001$) have higher odds of increased sickness absence compared to Germany (reference).
- Many countries do not show statistically significant differences from Germany.

b) Company Size:

- Larger companies are more likely to report increased sickness absence.
- 250+ employees (OR = 1.644, $p < 0.001$) have the highest odds compared to 5-9 employees.

c) Sector (NACE Group):

- Sector Q (Human health and social work) (OR = 1.556, $p < 0.001$) and sector P (Education) (OR = 1.289, $p < 0.001$) have higher odds of increased sickness absence compared to the reference group (NACE G, H, I, R).
- Sector C (Manufacturing) (OR = 1.232, $p < 0.001$) also shows higher odds.

d) Function of Respondent:

- Most categories of respondents report lower odds of increased sickness absence compared to owners/managing directors.
- External OSH consultants report the lowest odds (OR = 0.662, $p = 0.047$).

e) Organisation Type:

- Multi-site establishments have lower odds (OR = 0.817, $p < 0.001$) of reporting increased sickness absence.

f) Employee Representation:

- Having only works council or trade union is associated with lower odds (OR = 0.905, $p = 0.009$) of increased sickness absence.
- Having OSH representation is associated with higher odds (OR = 1.194, $p = 0.007$) of increased sickness absence.

g) Risk Profile:

- Generally, establishments with fewer traditional risks have lower odds of increased sickness absence compared to those with no traditional risks.
- For psychosocial risks, fewer risks are associated with lower odds of increased sickness absence.

h) Labour Inspectorate Visits:

- Both visited establishments (OR = 1.993, $p < 0.001$) and those where visits are not applicable (OR = 1.939, $p < 0.001$) have higher odds of reporting increased sickness absence compared to those not visited.

3. Non-significant Predictors:

- The effect of survey mode (CAWI vs. CATI) is not statistically significant ($p = 0.545$).
- The effect of having OSH expertise available is not statistically significant ($p = 0.109$).

The model predictive power is weak, and it fails to predict any "Yes" responses, which suggests it might not be capturing important factors influencing increased sickness absence.

The low Nagelkerke R Square indicates that much of the variation in sickness absence is not explained by the included variables.

Table 14: Mode effect regression model Q159 « Sickness absence increased over the last 3 years»

Q159 « Sickness absence increased over the last 3 years »	Level of significance	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio - Lower	Confidence interval odds ratio - Upper
Interview Mode (Reference: CATI)				
CAWI	0.545	1.048	0.900	1.220
Country (Reference: Germany)				
Austria	0.666	1.071	0.786	1.458
Belgium	<0.001	2.335	1.758	3.103
Bulgaria	0.373	1.173	0.826	1.665
Switzerland	<0.001	2.232	1.707	2.919
Cyprus	0.346	1.364	0.715	2.601
Czech Republic	0.673	0.930	0.665	1.301
Denmark	<0.001	2.014	1.588	2.554
Estonia	0.570	1.180	0.667	2.090
Greece	0.016	1.472	1.075	2.015
Spain	<0.001	1.925	1.498	2.473
Finland	0.570	1.105	0.783	1.561
France	0.726	1.046	0.815	1.342
Croatia	0.843	1.045	0.673	1.625
Hungary	0.428	1.141	0.824	1.580
Ireland	<0.001	2.002	1.455	2.754
Iceland	0.061	2.116	0.966	4.632
Italy	0.006	1.426	1.109	1.834
Lithuania	0.112	0.647	0.378	1.108
Luxembourg	<0.001	3.061	1.807	5.184
Latvia	0.909	1.031	0.613	1.734

ESENER 2024 Quality report

Malta	0.663	1.212	0.511	2.873
The Netherlands	<0.001	1.965	1.495	2.583
Norway	<0.001	1.768	1.321	2.367
Poland	0.627	1.070	0.814	1.406
Portugal	0.200	1.218	0.901	1.647
Romania	0.486	0.894	0.652	1.225
Sweden	0.787	1.043	0.770	1.412
Slovenia	0.041	1.642	1.020	2.643
Slovakia	0.727	1.072	0.724	1.588
Size class (Reference: 5-9 employees)				
10 to 49 employees	<0.001	1.286	1.206	1.371
50 to 249 employees	<0.001	1.415	1.271	1.577
250 employees or more	<0.001	1.644	1.313	2.060
NACE Group (Reference: NACE G,H,I,R)				
NACE A	0.517	0.937	0.768	1.142
NACE B,D,E,F	0.586	1.030	0.927	1.144
NACE C	<0.001	1.232	1.116	1.359
NACE J,K,L,M,N,S	0.007	1.119	1.031	1.214
NACE O	0.724	0.969	0.812	1.155
NACE P	<0.001	1.289	1.140	1.457
NACE Q	<0.001	1.556	1.411	1.716
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	0.012	0.897	0.824	0.977
Manager with specific OSH tasks	0.104	0.893	0.778	1.024
OSH Specialist without managing function	0.002	0.853	0.770	0.945
Employee representative in charge of OSH	0.576	0.962	0.841	1.101
Another employee in charge of the subject	<0.001	0.851	0.778	0.931
External OSH consultant	0.047	0.662	0.441	0.994
NA on Q113	0.003	0.623	0.458	0.847
Q050/Q100. Type of organisation (Reference: Single site establishment)				

Multi-site establishment	<0.001	0.817	0.766	0.872
Q151. OSH expertise available (Reference: No OSH expertise available)				
OSH expertise available	0.109	0.919	0.829	1.019
Q350. Employee representation in terms of OSH (Reference: No employee representation in terms of OSH)				
Only works council or trade union	0.009	0.905	0.841	0.975
OSH representation	0.007	1.194	1.050	1.359
Q200. Risk profile - Number of traditional risks (Reference: No traditional risks)				
One	<0.001	0.619	0.484	0.792
Two	<0.001	0.714	0.589	0.864
Three	0.002	0.759	0.635	0.906
Four	0.004	0.776	0.651	0.924
Five	0.054	0.843	0.709	1.003
Six	0.749	0.972	0.818	1.155
Seven	0.987	0.999	0.840	1.188
Eight	0.426	0.931	0.780	1.110
Nine	0.097	1.164	0.973	1.392
Ten	0.815	1.023	0.847	1.235
Q201. Risk profile - Number of psychosocial risks (Reference: No psychosocial risks)				
One	<0.001	0.444	0.357	0.553
Two	<0.001	0.567	0.458	0.701
Three	<0.001	0.684	0.553	0.846
Four	0.008	0.749	0.604	0.929
Five	0.603	0.941	0.750	1.182
Q154. Visit from labour inspectorate (Reference: Not visited)				
Visited	<0.001	1.993	1.612	2.463
NA labour inspectorate visit	<0.001	1.939	1.566	2.401
Constant	<0.001	0.093		

11.6 Multi-variate logit regression model Q202_4

The logistic regression output for Q202_4 (Provision of ergonomic equipment as measure taken in the last 3 years).

1. Model Fit:

- The Omnibus Tests show that the model is statistically significant ($p < 0.001$), indicating that the predictors, as a set, reliably predict the outcome.
- The Nagelkerke R Square of 0.132 suggests that approximately 13.2% of the variation in the outcome is explained by the predictors, which is a moderate fit.
- The model correctly classifies 73.1% of cases overall, with excellent prediction for "Yes" responses (94.9%) but poor prediction for "No" responses (19.0%).

2. Statistically significant predictors:

a) Mode:

- CAWI mode has significantly higher odds ($OR = 1.243$, $p < 0.001$) of reporting provision of ergonomic equipment compared to CATI.

b) Country: There are significant differences between countries. For example:

- Sweden ($OR = 1.751$, $p < 0.001$) has higher odds of providing ergonomic equipment compared to Germany (reference).
- Bulgaria ($OR = 0.330$, $p < 0.001$), Italy ($OR = 0.374$, $p < 0.001$), and Lithuania ($OR = 0.371$, $p < 0.001$) have much lower odds compared to Germany.

c) Company Size:

- Larger companies are more likely to provide ergonomic equipment.
- 250+ employees ($OR = 2.704$, $p < 0.001$) have the highest odds compared to 5-9 employees.

d) Sector (NACE Group):

- Sectors J,K,L,M,N,S ($OR = 1.938$, $p < 0.001$) and sector O (Public administration) ($OR = 1.774$, $p < 0.001$) have higher odds of providing ergonomic equipment compared to the reference group (NACE G, H, I, R).
- All sectors show significantly higher odds than the reference group.

e) Function of Respondent:

- All categories of respondents report significantly higher odds of providing ergonomic equipment compared to owners/managing directors.
- OSH Specialists without managing function have the highest odds ($OR = 1.736$, $p < 0.001$).

f) Organisation Type:

- Multi-site establishments have slightly lower odds ($OR = 0.904$, $p < 0.001$) of providing ergonomic equipment.

g) OSH Expertise:

- Having OSH expertise available is associated with lower odds ($OR = 0.571$, $p < 0.001$) of providing ergonomic equipment.

h) Employee Representation:

- Both types of employee representation are associated with lower odds of providing ergonomic equipment compared to no representation.

i) Risk Profile:

- Generally, establishments with more traditional risks have lower odds of providing ergonomic equipment compared to those with no traditional risks.
- For psychosocial risks, having 2 or 3 risks is associated with higher odds of providing ergonomic equipment compared to having no psychosocial risks.

j) Labour Inspectorate Visits:

- Establishments that were visited have higher odds (OR = 1.255, $p < 0.001$) of providing ergonomic equipment compared to those not visited.

The model's fit is moderate, indicating that while these factors are important, there are likely other influential factors not captured in this analysis.

Table 15: Mode effect regression model Q202_4 « Provision of ergonomic equipment»

Q202_4 « Provision of ergonomic equipment »	Level of significance	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio - Lower	Confidence interval odds ratio - Upper
Interview Mode (Reference: CATI)				
CAWI	<0.001	1.243	1.107	1.396
Country (Reference: Germany)				
Austria	0.822	1.026	0.819	1.286
Belgium	0.006	0.722	0.573	0.909
Bulgaria	<0.001	0.330	0.262	0.417
Switzerland	0.249	0.885	0.719	1.089
Cyprus	0.255	0.770	0.490	1.209
Czech Republic	<0.001	0.408	0.325	0.510
Denmark	0.429	0.930	0.778	1.112
Estonia	0.941	0.984	0.638	1.517
Greece	0.874	1.019	0.810	1.282
Spain	0.338	1.098	0.907	1.330
Finland	0.982	0.997	0.766	1.297
France	0.718	0.966	0.803	1.163
Croatia	<0.001	0.507	0.380	0.678
Hungary	<0.001	0.401	0.321	0.501
Ireland	<0.001	0.635	0.495	0.815
Iceland	0.941	1.026	0.519	2.026
Italy	<0.001	0.374	0.311	0.449
Lithuania	<0.001	0.371	0.277	0.496
Luxembourg	0.014	0.549	0.340	0.885
Latvia	0.003	0.609	0.437	0.849
Malta	0.449	1.305	0.655	2.600
The Netherlands	0.322	1.117	0.898	1.389
Norway	0.619	0.941	0.740	1.196
Poland	0.295	0.900	0.739	1.096
Portugal	<0.001	0.453	0.366	0.561

ESENER 2024 Quality report

Romania	<0.001	0.457	0.370	0.565
Sweden	<0.001	1.751	1.379	2.224
Slovenia	0.028	0.662	0.457	0.957
Slovakia	<0.001	0.400	0.309	0.519
Size class (Reference: 5-9 employees)				
10 to 49 employees	<0.001	1.337	1.274	1.404
50 to 249 employees	<0.001	2.268	2.032	2.531
250 employees or more	<0.001	2.704	2.017	3.624
NACE Group (Reference: NACE G,H,I,R)				
NACE A	0.357	1.067	0.929	1.226
NACE B,D,E,F	<0.001	1.145	1.057	1.239
NACE C	<0.001	1.147	1.064	1.237
NACE J,K,L,M,N,S	<0.001	1.938	1.817	2.066
NACE O	<0.001	1.774	1.522	2.068
NACE P	<0.001	1.380	1.247	1.526
NACE Q	<0.001	1.587	1.454	1.733
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	<0.001	1.412	1.320	1.510
Manager with specific OSH tasks	<0.001	1.605	1.422	1.812
OSH Specialist without managing function	<0.001	1.736	1.592	1.894
Employee representative in charge of OSH	<0.001	1.693	1.507	1.902
Another employee in charge of the subject	<0.001	1.650	1.540	1.768
External OSH consultant	0.049	1.350	1.001	1.820
NA on Q113	0.082	1.199	0.977	1.472
Q050/Q100. Type of organisation (Reference: Single site establishment)				
Multi-site establishment	<0.001	0.904	0.855	0.956
Q151. OSH expertise available (Reference: No OSH expertise available)				
OSH expertise available	<0.001	0.571	0.531	0.615

Q350. Employee representation in terms of OSH (Reference: No employee representation in terms of OSH)				
Only works council or trade union	<0.001	0.720	0.682	0.761
OSH representation	<0.001	0.831	0.747	0.924
Q200. Risk profile - Number of traditional risks (Reference: No traditional risks)				
One	<0.001	0.362	0.298	0.439
Two	<0.001	0.574	0.482	0.684
Three	<0.001	0.676	0.570	0.802
Four	<0.001	0.600	0.507	0.710
Five	<0.001	0.529	0.447	0.625
Six	<0.001	0.579	0.489	0.685
Seven	<0.001	0.618	0.521	0.734
Eight	<0.001	0.607	0.511	0.721
Nine	<0.001	0.670	0.560	0.801
Ten	0.002	0.743	0.616	0.897
Q201. Risk profile - Number of psychosocial risks (Reference: No psychosocial risks)				
One	0.051	1.236	0.999	1.528
Two	0.009	1.326	1.075	1.637
Three	0.020	1.285	1.041	1.587
Four	0.214	1.146	0.925	1.419
Five	0.615	1.060	0.844	1.332
Q154. Visit from labour inspectorate (Reference: Not visited)				
Visited	<0.001	1.255	1.102	1.429
NA labour inspectorate visit	0.164	1.098	0.963	1.253
Constant	<0.001	2.055		

11.8 Multi-variate logit regression model Q357

The logistic regression output for Q357 (Occasional or regular discussions of health and safety in staff or team meetings).

1. Model Fit:

- The Omnibus Tests show that the model is statistically significant ($p < 0.001$), indicating that the predictors, as a set, reliably predict the outcome.
- The Nagelkerke R Square of 0.132 suggests that approximately 13.2% of the variation in the outcome is explained by the predictors, which is a moderate fit.
- The model correctly classifies 78.5% of cases overall, with excellent prediction for "Yes" responses (98.6%) but very poor prediction for "No" responses (4.4%).

2. Statistically significant predictors:

a) Country: There are significant differences between countries. For example:

- Romania (OR = 2.273, $p < 0.001$) and Sweden (OR = 1.658, $p < 0.001$) have higher odds of having health and safety discussions compared to Germany (reference).
- France (OR = 0.358, $p < 0.001$) and Spain (OR = 0.391, $p < 0.001$) have much lower odds compared to Germany.

b) Company Size:

- Larger companies are more likely to have health and safety discussions.
- 250+ employees (OR = 2.485, $p < 0.001$) have the highest odds compared to 5-9 employees.

c) Sector (NACE Group):

- Sector Q (Human health and social work) (OR = 1.799, $p < 0.001$) and sector A (Agriculture, forestry and fishing) (OR = 1.542, $p < 0.001$) have higher odds of having health and safety discussions compared to the reference group (NACE G, H, I, R).
- Most sectors show significantly higher odds than the reference group, except for sector O (Public administration).

d) Function of Respondent:

- Managers without specific OSH tasks (OR = 0.793, $p < 0.001$) and another employee in charge of the subject (OR = 0.735, $p < 0.001$) report lower odds of having health and safety discussions compared to owners/managing directors.

e) Organisation Type:

- Multi-site establishments have slightly lower odds (OR = 0.919, $p = 0.005$) of having health and safety discussions.

f) OSH Expertise:

- Having OSH expertise available is associated with lower odds (OR = 0.576, $p < 0.001$) of having health and safety discussions.

g) Employee Representation:

- Both types of employee representation are associated with lower odds of having health and safety discussions compared to no representation.

h) Risk Profile:

- Generally, establishments with more traditional risks have lower odds of having health and safety discussions compared to those with no traditional risks.
- For psychosocial risks, having 1-3 risks is associated with higher odds of having health and safety discussions compared to having no psychosocial risks.

i) Labour Inspectorate Visits:

- Establishments where labour inspectorate visits are not applicable have higher odds (OR = 1.367, $p < 0.001$) of having health and safety discussions.

3. Non-significant Predictors:

- The effect of survey mode (CAWI vs. CATI) is not statistically significant ($p = 0.335$).

The model's fit is moderate, indicating that while these factors are important, there are likely other influential factors not captured in this analysis.

Table 16: Mode effect regression model Q357 « Occasional or regular discussions of health and safety in staff or team meetings »

Q357 « Provision of ergonomic equipment »	Level of significance	Degree / extent of the correlation (odds ratio)	Confidence interval odds ratio - Lower	Confidence interval odds ratio - Upper
Interview Mode (Reference: CATI)				
CAWI	0.335	1.069	0.933	1.224
Country (Reference: Germany)				
Austria	<0.001	0.397	0.307	0.513
Belgium	<0.001	0.438	0.336	0.570
Bulgaria	0.114	1.300	0.939	1.801
Switzerland	<0.001	0.614	0.480	0.786
Cyprus	0.330	1.339	0.744	2.410
Czech Republic	0.318	1.172	0.858	1.601
Denmark	<0.001	0.436	0.350	0.542
Estonia	0.269	0.747	0.446	1.253
Greece	0.020	1.397	1.053	1.852
Spain	<0.001	0.391	0.312	0.490
Finland	0.688	1.073	0.761	1.511
France	<0.001	0.358	0.287	0.447
Croatia	0.103	0.736	0.509	1.064
Hungary	0.303	1.165	0.871	1.558
Ireland	0.725	1.059	0.771	1.453
Iceland	0.010	0.407	0.206	0.807
Italy	0.256	0.874	0.694	1.102
Lithuania	0.336	0.828	0.564	1.216
Luxembourg	0.011	0.501	0.294	0.853
Latvia	0.824	1.049	0.687	1.602
Malta	0.913	1.044	0.485	2.247

ESENER 2024 Quality report

The Netherlands	<0.001	0.625	0.485	0.804
Norway	0.031	1.432	1.034	1.983
Poland	0.002	0.689	0.543	0.873
Portugal	<0.001	0.367	0.286	0.472
Romania	<0.001	2.273	1.607	3.213
Sweden	<0.001	1.658	1.231	2.232
Slovenia	0.547	1.163	0.712	1.899
Slovakia	0.145	1.317	0.909	1.909
Size class (Reference: 5-9 employees)				
10 to 49 employees	<0.001	1.201	1.139	1.267
50 to 249 employees	<0.001	1.707	1.520	1.918
250 employees or more	<0.001	2.485	1.778	3.473
NACE Group (Reference: NACE G,H,I,R)				
NACE A	<0.001	1.542	1.287	1.849
NACE B,D,E,F	<0.001	1.338	1.219	1.469
NACE C	0.027	1.104	1.011	1.205
NACE J,K,L,M,N,S	0.007	1.094	1.025	1.167
NACE O	0.286	0.924	0.800	1.068
NACE P	<0.001	1.323	1.181	1.481
NACE Q	<0.001	1.799	1.625	1.992
Q113. Function in this establishment (Reference: The owner or a partner of this firm)				
Manager without specific OSH tasks	<0.001	0.793	0.739	0.851
Manager with specific OSH tasks	0.325	1.072	0.933	1.231
OSH Specialist without managing function	0.292	1.054	0.956	1.163
Employee representative in charge of OSH	0.662	0.971	0.853	1.106
Another employee in charge of the subject	<0.001	0.735	0.684	0.789
External OSH consultant	0.551	1.105	0.796	1.532
NA on Q113	<0.001	0.698	0.568	0.858
Q050/Q100. Type of organisation (Reference: Single site establishment)				
Multi-site establishment	0.005	0.919	0.866	0.975

Q151. OSH expertise available (Reference: No OSH expertise available)				
OSH expertise available	<0.001	0.576	0.533	0.622
Q350. Employee representation in terms of OSH (Reference: No employee representation in terms of OSH)				
Only works council or trade union	<0.001	0.549	0.518	0.582
OSH representation	<0.001	0.599	0.538	0.666
Q200. Risk profile - Number of traditional risks (Reference: No traditional risks)				
One	<0.001	0.505	0.411	0.621
Two	<0.001	0.550	0.458	0.661
Three	<0.001	0.605	0.506	0.723
Four	<0.001	0.613	0.514	0.731
Five	<0.001	0.736	0.616	0.879
Six	<0.001	0.718	0.601	0.858
Seven	0.083	0.852	0.711	1.021
Eight	0.001	0.740	0.617	0.889
Nine	0.301	0.904	0.747	1.095
Ten	0.920	0.990	0.807	1.213
Q201. Risk profile - Number of psychosocial risks (Reference: No psychosocial risks)				
One	<0.001	1.528	1.218	1.917
Two	<0.001	1.509	1.205	1.888
Three	0.019	1.307	1.045	1.636
Four	0.086	1.221	0.972	1.534
Five	0.978	1.003	0.788	1.278
Q154. Visit from labour inspectorate (Reference: Not visited)				
Visited	0.374	1.065	0.927	1.223
NA labour inspectorate visit	<0.001	1.367	1.187	1.575
Constant	<0.001	6.721		