

Title	Employers' perceived importance and the use (or non-use) of workplace risk assessment in micro-sized and small enterprises in Europe with focus on Cyprus
Authors	Anyfantis, I. D.;Leka, Stavroula;Reniers, G.;Boustras, G.
Publication date	2021-03-21
Original Citation	Anyfantis, I. D., Leka, S., Reniers, G. and Boustras, G. (2021) 'Employers' perceived importance and the use (or non-use) of workplace risk assessment in micro-sized and small enterprises in Europe with focus on Cyprus', Safety Science, 139, 05256 (7pp). Doi: 10.1016/j.ssci.2021.105256
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1016/j.ssci.2021.105256
Rights	© 2021, Elsevier Ltd. All rights reserved. This manuscript version is made available under the CC BY-NC-ND 4.0 license. - https://creativecommons.org/licenses/by-nc-nd/4.0/
Download date	2024-09-12 06:46:35
Item downloaded from	https://hdl.handle.net/10468/11202

1 **Employers' perceived importance and the use (or non-use) of**
2 **workplace risk assessment in micro-sized enterprises and SMEs in**
3 **Europe with focus on Cyprus**

4 I.D. Anyfantis^{a*}, S. Leka^b, G. Reniers^c, G. Boustras^d

5 *^a School of Sciences, European University Cyprus, Nicosia, Cyprus*

6 *^b Cork University Business School, University College Cork, Ireland & Centre for*
7 *Organizational Health & Development, School of Medicine, University of Nottingham, UK*

8 *^c Safety and Security Science, TPM Faculty, TU Delft, Jaffalaan 5, 2628 Delft, the*
9 *Netherlands*

10 *^d School of Business Administration, European University Cyprus, Nicosia, Cyprus*

11

12

13 Correspondence:

14 Ioannis D. Anyfantis, School of Science, European University Cyprus, 6 Diogenous
15 street, Nicosia, P.O Box: 22006, Cyprus

16 Mob.: +306977532626, +35796392256

17 e-mail: i.anyfantis@external.euc.ac.cy , yiannis4@gmail.com

18 [ORCID: 0000-0003-2134-8287](https://orcid.org/0000-0003-2134-8287)

19

20

21

22 **Employers’ perceived importance and the use (or non-use) of workplace**
23 **risk assessment in micro-sized and small enterprises in Europe with**
24 **focus on Cyprus**

25

26 **Abstract**

27 Occupational Safety and Health is often poorly managed in micro-sized enterprises (MiSEs)
28 and small and medium enterprises (SMEs). Previous studies have shown that employers in
29 such enterprises do not conduct and/or regularly review workplace risk assessments, even
30 though this is required by legislation. In other cases, they may conduct a superficial workplace
31 risk assessment just to comply with legislation and satisfy the authorities. This study attempts
32 to shed some light into the actual use or non-use of workplace risk assessment by MiSEs and
33 SMEs, the level of its utilization, and investigate if it is used as a tool of occupational safety
34 and health promotion and the reduction of workplace accidents and occupational diseases. It
35 also introduces the concept of employers’ perception of the actual value of the risk
36 assessment process. Data from ESENER-2 survey were analysed as well as data gathered by a
37 survey conducted in Cyprus that included 201 MiSEs employing less than five employees, an
38 area not covered by previous ESENER surveys. Analysis revealed that a significant percentage
39 of employers in MiSEs do not perceive risk assessment as a valuable tool for improving
40 occupational safety and health, indicating a problematic perception of and attitude towards
41 health and safety issues. Moreover, considerable differences were identified not only in
42 occupational safety and health management, but also in the perceived value of workplace risk
43 assessment between northern and southern European countries, as well as for enterprises
44 employing less than five employees.

45

46 **Keywords:** risk assessment, SMEs, micro-sized enterprises, employers’ perception, safety
47 management, ESENER, Cyprus

48

49

50 **Introduction**

51 Small and medium-sized enterprises (SMEs) are regarded as key drivers of employment and
52 economic growth globally, forming the backbone of most countries’ economies, either
53 developed or developing (“European Union Labour Force Survey - Eurostat”, 2016). Statistics
54 show that about 85% of European workers are working in SMEs (EU-OSHA – European Agency

55 for Safety and Health at Work, 2009). Different economic sectors utilise different definitions
56 of small businesses (Cunningham et al., 2014). For our research, the 2003/361/EC
57 Recommendation (European Commission, 2003) will be used to define SMEs based on staff
58 headcount, that defines Micro (< 10 employees), Small (< 50 employees), and Medium-sized
59 Enterprises (< 250 employees).

60 SMEs are often characterized by significant flexibility that may offer advantages regarding the
61 adoption of new methods, procedures and technologies. Eardley et. al. (1997) suggest that
62 flexibility is the ability to change direction rapidly or deviate from a predetermined course of
63 action (Eardley et al., 1997). Even though this ability could mean that SMEs are successfully
64 implementing management practices, they face many challenges. Most SMEs have high staff
65 turnover and an associated instability in labour conditions (EC - European Commission, 2004).

66 According to previous studies, occupational safety and health (OSH) is often poorly managed
67 in SMEs, with workers at greater risk of workplace accidents or work-related ill health
68 (Boustras and Guldenmund, 2017; Cagno et al., 2014; Champoux and Brun, 2003; Fabiano et
69 al., 2004; Hasle and Limborg, 2006). Research has provided growing evidence that those
70 working in SMEs are more frequently exposed to hazardous situations and suffer more work-
71 related injuries and illnesses than those working in large enterprises (Clifton, 2000; Micheli
72 and Cagno, 2010; Sørensen et al., 2007). Those figures may become even worse if an
73 assumable high level of under-reporting in small businesses is considered (Probst and Estrada,
74 2010). Particularly in small and micro enterprises, precarious work and flexible, non-
75 prescriptive legal requirements are rarely translated into workplace practice (Bluff, 2019). The
76 aim of this study is to assess the actual use of risk assessment by employers for improving OSH
77 in SMEs and micro-sized enterprises (MiSEs) across Europe, taking into consideration their
78 perception on the importance of the workplace risk assessment process and their
79 engagement.

80 The introduction of the European Union Framework Directive on Safety and Health at Work
81 back in 1989 (89/391/EEC) raised the importance of a well-conducted, systematic and
82 documented workplace risk assessment for every workplace in EU ("COUNCIL DIRECTIVE of
83 12 June 1989 on the introduction of measures to encourage improvements in the safety and
84 health of workers at work (89/391/EEC)", 1989). Transposition of the directive into national
85 legislation and other national legislative provisions mandates the implementation of risk
86 assessment either in every workplace or in workplaces employing staff above a nationally
87 specified threshold. Auditing and enforcement of proper implementation is performed by the

88 National Labour Inspectorates (NLIs) of EU Member States. Risk assessment is regarded as the
89 first and most significant step in managing OSH in the workplace. It should include both
90 traditional and emerging risks (e.g. psychosocial risks, risks arising from emerging
91 technologies). A thorough risk assessment addressing different types of risks can also provide
92 a structured framework during OSH auditing procedures.

93 Taking care of usual business and also doing this in a safe way may often be really challenging
94 for MiSEs and SMEs. There are several reasons for this, like limitations in human resources,
95 financial aspects, or lack of expertise and/or experience (Boustras and Guldenmund, 2017). In
96 any case, all enterprises must comply with European directives and national Legislation
97 requiring them to conduct a risk assessment and implement measures and audits on the basis
98 of the findings. Although, in some Member States, like Cyprus, enterprises employing less than
99 five (5) workers, are not required to conduct a workplace risk assessment.

100 Previous studies have shown that there were considerable shortcomings in translating policy
101 into practice within SMEs, especially MiSEs (Boustras and Guldenmund, 2017; EC - European
102 Commission, 2004; Schulte et al., 2018). On top of that, statistics reveal that SMEs account for
103 an uneven share of work-related injuries, illnesses, and fatalities, since official statistics report
104 that 82% of all occupational injuries and around 90% of fatal accidents occur in SMEs
105 (Eurostat, 2004). One of the key reasons associated with those figures is considered to be the
106 fact that risk is less well managed in SMEs than in larger organizations (Walters, 2004).

107 Most of MiSEs, have an informal organisational structure, where the employer is the owner
108 of the enterprise who also acts as the general manager of the firm managing every aspect of
109 the business including health and safety issues, even though they may lack the appropriate
110 competencies and knowledge (EC - European Commission, 2004). Despite the fact that
111 previous studies have identified a positive association between worker participation and the
112 implementation of OSH management measures, worker participation is usually neglected by
113 employers while SMEs and MiSEs are predominately non-unionised (Frick and Walters, 1998).
114 In addition, the employer often does not have sufficient time to dedicate to OSH management,
115 given the burden of other responsibilities (Anyfantis and Biska, 2017; Vassie et al., 2000).
116 Another essential factor may be close social relationships present in those enterprises, which
117 may pose difficulties for employees to raise OSH concerns to the employer, resulting in
118 workers being more likely to accept poor working conditions. Finally lack of available

119 resources may also be an excuse, since most of available resources are spent with particular
120 focus on short-term survival (Anyfantis et al., 2016).

121 The European Commission, through EU-OSHA recognizes all those peculiarities and limitations
122 of MiSEs, as well as the importance of conducting a workplace risk assessment (Wadsworth
123 and Walters, 2018). In this context, it provides a variety of information sources and tools on
124 workplace risk assessment, including OiRA (Online interactive Risk Assessment), that is an on-
125 line easy to use tool for conducting a risk assessment (EU-OSHA, 2018a). This tool provides
126 the resources and expertise required to enable mainly micro and small organisations to assess
127 risks using their own resources. In many cases, such tools may be the only legitimate OSH
128 related procedure for the firm, since because of the large number of MiSEs, the probability of
129 receiving a proactive visit by the NLI is actually low (Walters, 2004).

130 An important factor to consider when conducting a workplace risk assessment and
131 implementing an effective safety management system is risk perception (Parker et al., 2007;
132 Reinhold et al., 2015). Especially for MiSEs, this approach provides reasoning about the way
133 that the employer and employees perceive risk and their concerns towards risk and potential
134 consequences (Aven, 2016). Perceptions of acceptable and unacceptable risks may be
135 misleading, resulting in MiSEs adopting a more tolerant approach regarding risks, ignoring
136 actual high risks that are considered as acceptable and spending valuable resources
137 ineffectively (Walters, 2001). During the last few years, the role of poor hazard recognition
138 and the underestimation of safety risk has received some attention by academic research. The
139 main focus was in industries that are dynamic and unpredictable, such as the construction
140 industry, where a large proportion of hazards go undetected (Albert et al., 2014; Carter and
141 Smith, 2006).

142 A critical question is then raised, about the actual use and implementation of risk assessment
143 for the case of SMEs and MiSE as a subset. That is because, in many cases, risk assessment is
144 conducted just for compliance purposes, to satisfy the NLI (in case of an audit) and is not used
145 appropriately for the successful management of OSH and reduction of accidents and
146 occupational diseases (Baldock et al., 2006). Therefore, risk assessment may lose its dynamic
147 nature, and findings may neither be implemented nor communicated appropriately to
148 employees since previous studies reveal that MiSEs are looking only for an acceptable level of
149 risk (EU-OSHA, 2018b). It is like answering the question: *“How much do we have to do in order
150 to be accepted by workers, customers, authorities, peers and the local community?”*. Today

151 there is enough evidence that even in the leading economies of European Union, such as
152 Germany, only a small percentage of companies carry out workplace risk assessment which
153 not only will meet the essential procedural requirements but will also take into consideration
154 new and emerging risks in a comprehensive manner (Beck and Lenhardt, 2019; Lenhardt and
155 Beck, 2016).

156 Therefore, the perceived importance of risk assessment for employers and managers in SMEs
157 is equally important. The perceived importance of the value of risk assessment and its
158 respective exploitation are determining factors of its use (Slovic et al., 1982), with risk
159 perception being a determining factor in risk evaluation and management (Klinke and Renn,
160 2002; Slovic, 2000).

161 Few studies have been performed to investigate the current status of risk assessment in
162 European SMEs and MiSEs. A study in Denmark reported that the size of small firms is
163 negatively correlated with risk assessment compliance (Jensen et al., 2001). Annual reports of
164 NLI also provide some evidence. In Greece, based on the data collected in the hair-dressing
165 sector (micro-enterprises) in 2013, it was found that only 20% had a workplace risk
166 assessment in place. For the same year, only 69% of the audited enterprises in the recycling
167 sector had conducted a risk assessment that was regarded as acceptable by the labour
168 inspectors. According to the results of another campaign in SMEs in the logistics sector in
169 2012, only 57% had conducted a thorough workplace risk assessment. The remainder had
170 never conducted a risk assessment or their risk assessment covered only the minimal content
171 in order to avoid a direct sanction by the NLI. The most commonly reported reasons for failure
172 to comply were lack of time and knowledge (SEPE, 2013).

173 In 2009, EU-OSHA launched the first European Survey of Enterprises on New and Emerging
174 Risks (ESENER-1) (EU-OSHA, 2010). Another one followed in 2014 (ESENER-2) (EU-OSHA,
175 2015, p.) while the latest ESENER wave was carried out in 2019 (EU-OSHA, 2019). ESENER-2
176 focused on establishments with ten or more employees in the 27 EU Member States and
177 additionally on Croatia, Turkey, Norway and Switzerland while it included enterprises that
178 employed more than five (5) employees, covering in this way a proportion of MiSEs within the
179 EU.

180 However, businesses employing 1-5 employees were not included in ESENER 2 (EU-OSHA,
181 2015), even though they represent a significant percentage of enterprises. As a result, an
182 important part of the picture has been left unattended on a European level, since in many

183 Member States like Greece a workplace risk assessment is required for every employer, even
184 though other states such as Cyprus apply a threshold of five employees.

185 The current study will investigate the use and effectiveness of risk assessment in European
186 SMEs and MiSEs as perceived by employers. Additionally, it will investigate risk
187 communication issues, based on risk assessment findings and the implementation of
188 adequate control measures. It will also verify the dynamic nature of the process, in terms of
189 periodical review. The case of Cyprus will be our main focus. Cyprus is a small economy in
190 which the vast majority of businesses are micro and small enterprises. It belongs to the
191 Mediterranean countries that are characterized as low trust cultures, in that one trusts family
192 first and foremost, whereas institutions such as government are not highly trusted and
193 supported, unlike the Nordic countries for which the opposite would apply (Giordano, 2012).
194 This differentiation is backed by the concept of cultural relativity in organizational practices
195 (Hofstede, 1983). Differences across those two groups of countries will also be assessed in our
196 study.

197 Our study will therefore attempt to answer two main research questions:

198 Q1: To what extent do employers in MiSEs and SMEs across Europe recognize the importance
199 of risk assessment and do they accordingly engage with the process of conducting it?

200 Q2: Are there differences in terms of the risk assessment process, between MiSEs and SMEs
201 across European countries and specifically between Mediterranean and Nordic countries?

202 **Materials and methods**

203 Primary and secondary data were used for analysis. A survey was conducted with SMEs
204 including micro enterprises in Cyprus, while secondary data were used through ESENER for
205 other EU Member States.

206 ESENER-2 is a pan-European survey of management and worker representatives, of commonly
207 accepted value, readily available for analysis. The statistical population comprises all
208 organisations that have five or more employees in the 36 participating countries, while it
209 covers most sectors of economic activity except private households (NACE T). One interview
210 was conducted per organization with the person “most knowledgeable about health and
211 safety”. There were 85 questions (not all were answered by all respondents) in nine
212 categories.

213 Answers to specific ESENER questions were analysed in this study. Specifically, our research
214 included analysis and assessment of the following questions:

- 215 • Q250: Does your establishment regularly carry out workplace risk assessments?
- 216 • Q251: Are workplace risk assessments mainly conducted by internal staff or are they
217 contracted to external service providers?
- 218 • Q254: In what year was the last workplace risk assessment carried out?
- 219 • Q255: Has it been documented in written form?
- 220 • Q256: Who has been provided with the findings of the workplace risk assessment?
- 221 • Q259: In your establishment, is the risk assessment procedure seen as a useful way of
222 managing health and safety?

223
224 In order to acquire a more detailed view and the actual use or non-use of risk assessment by
225 SMEs, apart from the data that refer to Cyprus, two groups of countries were further formed
226 and analysed. The first group included Mediterranean countries (Cyprus, Greece, Spain, Malta,
227 Portugal, Italy), which are considered to have a similar OSH related culture and approach to
228 OSH. The second group included the Nordic countries (Denmark, Finland, Norway, Sweden),
229 which have been regarded as relatively developed in health promotion (WHO, 2002).

230 Another source of valuable data for our research was the annual reports published by the
231 NLI, which are freely available from the NLI's web sites. These reports usually vary from
232 country to country, however, they may include several interesting parameters, such as type
233 of violations identified during on-site visits. Our main concern related to audit results on the
234 existence and content of risk assessments. Annual reports from Greece and Cyprus were
235 analyzed and assessed.

236 Finally, a survey study on OSH was conducted in Cyprus during the first quarter of 2017
237 focusing on small and MiSEs. A pilot study was conducted among ten micro-firms to test
238 whether the questions of the questionnaire were easily comprehended by the respondents.
239 Based on the results of the pilot study, the questionnaire was optimized for clarity and
240 finalized. The final ESENER-based questionnaire was distributed to micro and small
241 enterprises that additionally included questions about the importance of the risk assessment
242 process, shortages of resources, including staff, money, time, and expertise. Additional
243 questions on management awareness, current economic situation and the degree of
244 employees' involvement in OSH management were included. There were 85 questions (not all
245 of them are answered by all respondents) distributed in nine categories.

246 We distributed the questionnaire to enterprises that represent a broad range of economic
247 sectors, that MiSEs cover in Cyprus, according to the National Statistical Service (Cyprus
248 Statistical Service, 2018). Accordingly, our study included SMEs from the wholesale sector, the
249 retail sector, leisure activities, manufacturing, construction and services sector.

250 **Data analysis**

251 Out of the 350 enterprises targeted, 201 agreed to participate in our study (57.4% response
252 rate). First, bivariate correlations were calculated to examine potential associations between
253 the perceived importance of risk assessment and independent variables like size of the
254 enterprise, economic sector, use of external OSH professionals, degree of workers'
255 involvement, etc. Additionally, regression modeling was used on the data collected through
256 our survey, to identify those drivers and barriers significantly impacting upon conducting an
257 effective risk assessment, for the case of micro and small enterprises.

258 As the dependent variable the employer's perception of the importance of risk assessment
259 was used, that is summarized in this question: "Do you consider risk assessment and the
260 produced document as one of the most important tools for workplace safety?". The
261 independent variables used were either enterprise specific like number of workers, year of
262 establishment or OSH specific, like use of external OSH services, degree of workers'
263 involvement in OSH management, etc.

264 **Results**

265 The responses to ESENER-2 questions for Cyprus and the Mediterranean and Nordic countries
266 are presented in Table 1.

267 *Table 1.*

268 Chi-square and Mann-Whitney U tests were performed for each question presented in Table
269 1, to identify differences related to risk assessment between Mediterranean and Nordic
270 countries. There were statistically significant differences between the responses of those two
271 country groups to all questions except Q254, which refers to the year that risk assessment
272 was conducted. In Nordic countries, 74.8% of workplace risk assessments are mainly
273 conducted by internal staff, while for Mediterranean countries, the respective rate falls to
274 24.2%. Moreover, in Nordic countries, in 84.9% of responses reported that the employees are
275 provided with the findings of risk assessment, while for Mediterranean countries, the
276 respective rate is 68.9%.

277 Analysis of the collected data from our MiSE specific survey conducted in Cyprus revealed that
278 only 31% of respondents recognized the importance of risk assessment in improving OSH.
279 Moreover, only 65% were aware of the existence of a workplace risk assessment. Almost 50%
280 replied that there was no available document that explains responsibilities and procedures on
281 health and safety to people working in the establishment and another 55% reported that OSH-
282 related issues were not regularly discussed in team and staff meetings.

283 The results of our survey were analysed to identify correlations between the perceived
284 importance of risk assessment and workplace / OSH characteristics. These correlations are
285 presented in Table 2. The perceived importance of risk assessment was not significantly
286 correlated with the size and year of establishment of the organization. Moreover, it did not
287 correlate with possible lack of time, money, staff, management awareness, expertise or
288 special support. Positive correlations were found between the perceived importance of risk
289 assessment and the use of external OSH services and the degree of employee involvement in
290 OSH management, whereas a negative correlation was identified for the complexity of legal
291 obligations. However, all correlations were small in magnitude.

292 *Table 2.*
293

294 Logistic regression results are presented in Table 3. The final regression model predicted 15%
295 of the variance in perceived importance of risk assessment. Predictive factors for the
296 perceived importance of risk assessment were the use of external OSH expertise and the
297 degree of involvement of employees or their representatives.

298 *Table 3.*

299 **Discussion**

300 The analysis of the data used in this research aimed to shed some light on the critical question
301 of use or non-use of risk assessment on MiSEs and SMEs and its perceived importance by
302 employers. Furthermore, we explored differences between Mediterranean and Nordic
303 countries.

304 Workplace risk assessment is regarded as a systematic process that provides a roadmap to
305 achieve acceptable levels of health and safety in the workplace. This means that employers
306 should effectively communicate risk assessment findings to workers, and provide specific
307 training and additional materials that would inform, train and explain responsibilities and
308 procedures on health and safety, to the people working in the establishment.

309

310 Our analysis of ESENER-2 data indicated a statistically significant difference between SMEs in
311 Nordic (88%) and Mediterranean countries (94%) on whether the risk assessment procedure
312 is seen as a useful way for managing health and safety. This finding is surprising and might
313 indicate that in Nordic countries respondents have developed a different mindset. Nordic
314 countries have a long tradition in OSH and may have developed a safety culture thus several
315 issues may be more scrutinized and their true value questioned. It might also indicate a
316 perceived need for improvement of the risk assessment process to incorporate various
317 methods (Marhaviilas et al., 2011; Mohaghegh et al., 2009).

318 Our survey in Cyprus that also included MiSEs employing less than five employees, provided
319 significantly lower results compared to ESENER-2. According to these findings, only 31% of
320 respondents recognized the importance of risk assessment in improving OSH. Moreover, 20%
321 reported not providing their employees information related to the findings of the risk
322 assessment. There are several considerations in relation to these findings.

323 For the case of MiSEs and SMEs, employers may not consider workplace risk assessment as a
324 useful tool for effective risk management. For the scientific community it is well known that
325 risk assessment provides a structured and organized approach in managing risk in the
326 workplace (Carrivick et al., 2002; Health and Safety Executive (HSE), 2001; ISO, 2018).
327 However, in MiSEs and SMEs, employers may either not perceive risk in a clear and unbiased
328 way or they may doubt about the effectiveness of risk assessment as a methodological
329 approach to improve working conditions (Arezes and Miguel, 2008; Gallagher et al., 2003).
330 Several factors define employers' perception of health and safety and the importance of risk
331 assessment, as well as the actual use of it, like past experience, educational level, emotional
332 intelligence, and organizational skills (Jeffries, 2011). Many employers also perceive the risk
333 assessment process as an integral part of improving OSH, either by developing a safety
334 management system or by just complying to legislative provisions. However, smaller
335 enterprises prioritize OSH less in comparison to larger organisations and are less likely to hire
336 external experts to assist them with the risk assessment process (Boustras and Guldenmund,
337 2017).

338 Furthermore, our analysis of ESENER-2 data indicated that the majority of MiSEs and SMEs,
339 both in Nordic and Mediterranean countries reported they have conducted a workplace risk
340 assessment and consider this a useful approach in managing OSH. Risk assessment findings

341 were reported to be provided both to management and employees in most organisations,
342 although this was less common in Mediterranean than in Nordic countries. This finding
343 provides some evidence that European SMEs are engaging with risk assessment and there are
344 differences across different countries.

345 However, when it comes to specific countries, findings become considerably different. In the
346 case of Cyprus, ESENER-2 data indicate that 38% of MiSEs and SMEs reported that they do not
347 regularly carry out a workplace risk assessment. These enterprises reported either not having
348 a risk assessment process in place, or the risk assessment has not been reviewed for at least
349 2 years. This contradicts one of the basic properties of risk assessment: workplace risk
350 assessment should be a live document, revised at regular intervals as well as when there are
351 significant changes that take place in the enterprise (Aven, 2016). Moreover, we found similar
352 findings for MiSEs employing less than five employees in our survey in Cyprus. According to
353 these, 29% reported not having a workplace risk assessment process in place while 5% were
354 not even aware of risk assessment. Approximately half of the respondents reported that
355 health and safety issues are not regularly discussed in staff or team meetings. This situation
356 poses an additional burden on OSH, by plummeting the importance of worker participation in
357 SMEs' OSH management (Biggins et al., 1991; Frick and Walters, 1998; Glendon and Booth,
358 1982; Santos et al., 2013).

359 Our analysis did not indicate any relationships between lack of resources, such as time, money
360 of staff and the perceived value of risk assessment. We found an association with complexity
361 of legal requirements which is well-known obstacle of engagement in OSH for smaller
362 organisations (EU-OSHA, 2018b; Vassie et al., 2000). Furthermore, those enterprises that
363 reported valuing the risk assessment process also reported involving employees in this
364 process and using external OSH services.

365 This finding is in line with previous studies highlighting the importance of worker participation
366 especially when high-engagement methods are involved, like active participation and dialogue
367 (Bluff, 2019; EU-OSHA, 2011; Popma, 2009). Furthermore, more awareness in relation to OSH
368 and its importance has been found to be associated with more use of external services,
369 however this is more so in larger organisations (EU-OSHA, 2010).

370 Moreover, it should also be considered that in many countries, legislation provides the
371 employer the right to conduct their own workplace risk assessment. Taking into account the
372 limited resources in smaller enterprise, having a generic risk assessment being conducted by

373 an external consultant, at a low price just to comply with legislation, can become a convenient,
374 cost effective and tempting solution for many employers. However, in those cases the quality
375 would be questionable since some workplace specific hazards would never be identified and
376 there would be several pitfalls (Beale, 2001, Gadd et al., 2004). Focused campaigns conducted
377 by NLI could help limit with raising awareness in relation to this phenomenon and its effects.

378 Another interesting finding of our ESENER-2 analysis, is that for the case of Nordic countries,
379 the risk assessment is mainly conducted by internal staff, whereas external service providers
380 were reported to conduct more than half of the risk assessments for Mediterranean micro
381 enterprises and SMEs. This could also be related to the degree of ownership and employee
382 involvement in occupational safety and health processes. It indicates the development of a
383 more robust safety culture in Nordic countries (Reader, 2019).

384 From a macroscopic point of view, our findings identify a gap between what scientific
385 knowledge suggests is optimal and the actual way that OSH is managed in real life enterprises,
386 especially in micro and SMEs. Such findings should preoccupy the scientific community as well
387 as OSH experts about the application of scientific knowledge on real life practices. The
388 interface that interconnects scientific knowledge to real life practices should be redefined, re-
389 evaluated and re-established. Researchers should develop more action-oriented research, in
390 cooperation with practitioners (Hasle and Limborg, 2006).

391 Our study is based on cross-sectional data and causality cannot be inferred. Further research
392 is required using specific and focused questions, like those presented in our survey in Cyprus
393 on the actual use or non-use of risk assessment, referring to micro and SMEs in more
394 countries. Further comparative research between national level and European surveys would
395 also be beneficial.

396

397 **Conclusion**

398 The findings of our research indicate that according to the ESENER study, the majority of SMEs,
399 both in Nordic and Mediterranean countries have conducted a workplace risk assessment and
400 consider this as a useful approach in managing OSH, while both the management and the
401 employees have been provided with the findings.

402 However, the findings of our study, performed in Cypriot MiSEs, including micro enterprises
403 employing less than five employees, identified a significant percentage of SMEs that do not
404 perceive risk assessment as a valuable tool for improving OSH, indicating a lack of an

405 appropriate attitude towards health and safety and a lack of appropriate engagement with
406 the workplace risk assessment process. There are considerable differences in OSH
407 management and the perceived risk assessment value between European countries, SMEs and
408 MiSEs employing less than five employees, as well as in engagement with the risk assessment
409 process. The risk assessment procedure was not found to be considered of equal importance
410 in Nordic and Mediterranean countries while a significant difference was identified between
411 those two groups of countries in the number of MiSEs that report that they regularly carry out
412 a workplace risk assessment, employee participation in the process and the use of external
413 consultants. Moreover, this study identified a gap between knowledge in relation to good OSH
414 management practices and the actual implementation of these practices in SMEs and
415 MiSEs. Public OSH and sectoral organisations as well as the NLIs could play a key role in the
416 diffusion of knowledge, and sharing of experiences to address this gap, apart from the
417 enforcement of OSH policies and standards.

418

- 420 Albert Alex, Hallowell Matthew R., Kleiner Brian, Chen Ao, Golparvar-Fard Mani, 2014.
 421 Enhancing Construction Hazard Recognition with High-Fidelity Augmented Virtuality.
 422 *J. Constr. Eng. Manag.* 140, 04014024. [https://doi.org/10.1061/\(ASCE\)CO.1943-](https://doi.org/10.1061/(ASCE)CO.1943-)
 423 7862.0000860
- 424 Anyfantis, I., Boustras, G., Karageorgiou, A., 2016. Maintaining occupational safety and
 425 health levels during the financial crisis – A conceptual model. *Saf. Sci.*
 426 <https://doi.org/10.1016/j.ssci.2016.02.014>
- 427 Anyfantis, I.D., Biska, A., 2017. Musculoskeletal Disorders Among Greek Physiotherapists:
 428 Traditional and Emerging Risk Factors. *Saf. Health Work.*
 429 <https://doi.org/10.1016/j.shaw.2017.09.003>
- 430 Arezes, P.M., Miguel, A.S., 2008. Risk perception and safety behaviour: A study in an
 431 occupational environment. *Saf. Sci., Occupational Safety and Risk at ESREL 2006* 46,
 432 900–907. <https://doi.org/10.1016/j.ssci.2007.11.008>
- 433 Aven, T., 2016. Risk assessment and risk management: Review of recent advances on their
 434 foundation. *Eur. J. Oper. Res.* 253, 1–13. <https://doi.org/10.1016/j.ejor.2015.12.023>
- 435 Baldock, R., James, P., Smallbone, D., Vickers, I., 2006. Influences on Small-Firm Compliance-
 436 Related Behaviour: The Case of Workplace Health and Safety. *Environ. Plan. C Gov.*
 437 *Policy* 24, 827–846. <https://doi.org/10.1068/c0564>
- 438 Beale, C., 2001. Appropriate risk assessment: selecting the best methodology for solving the
 439 problem. Proceedings of the IBC Conference “The application and use of risk
 440 assessment”, London, October 8-9, UK., in: *The Application and Use of Risk*
 441 *Assessment*. Presented at the IBC Conference, London, UK.
- 442 Beck, D., Lenhardt, U., 2019. Consideration of psychosocial factors in workplace risk
 443 assessments: findings from a company survey in Germany. *Int. Arch. Occup. Environ.*
 444 *Health* 92, 435–451. <https://doi.org/10.1007/s00420-019-01416-5>
- 445 Biggins, D.R., Phillips, M., O’Sullivan, P., 1991. Benefits of Worker Participation in Health and
 446 Safety. *Labour Ind. J. Soc. Econ. Relat. Work* 4, 138–159.
 447 <https://doi.org/10.1080/10301763.1991.10669104>
- 448 Bluff, E., 2019. How SMEs respond to legal requirements to provide information, training,
 449 instruction and supervision to workers about work health and safety matters. *Saf.*
 450 *Sci.* 116, 45–57. <https://doi.org/10.1016/j.ssci.2019.02.036>
- 451 Boustras, G., Guldenmund, F.W., 2017. *Safety Management in Small and Medium Sized*
 452 *Enterprises (SMEs)*. CRC Press. <https://doi.org/10.4324/9781315151847>
- 453 Cagno, E., Micheli, G.J.L., Jacinto, C., Masi, D., 2014. An interpretive model of occupational
 454 safety performance for Small- and Medium-sized Enterprises. *Int. J. Ind. Ergon.* 44,
 455 60–74. <https://doi.org/10.1016/j.ergon.2013.08.005>
- 456 Carrivick, P.J.W., Lee, A.H., Yau, K.K.W., 2002. Effectiveness of a Workplace Risk Assessment
 457 Team in Reducing the Rate, Cost, and Duration of Occupational Injury. *J. Occup.*
 458 *Environ. Med.* 44, 155.
- 459 Carter Gregory, Smith Simon D., 2006. Safety Hazard Identification on Construction Projects.
 460 *J. Constr. Eng. Manag.* 132, 197–205. [https://doi.org/10.1061/\(ASCE\)0733-](https://doi.org/10.1061/(ASCE)0733-)
 461 9364(2006)132:2(197)
- 462 Champoux, D., Brun, J.-P., 2003. Occupational health and safety management in small size
 463 enterprises: an overview of the situation and avenues for intervention and research.
 464 *Saf. Sci.* 41, 301–318. [https://doi.org/10.1016/S0925-7535\(02\)00043-7](https://doi.org/10.1016/S0925-7535(02)00043-7)
- 465 Clifton, R., 2000. The consequences of new enterprise structures. *Mag. Eur. Agency Saf.*
 466 *Health Work* 2, 14–18.
- 467 COUNCIL DIRECTIVE of 12 June 1989 on the introduction of measures to encourage
 468 improvements in the safety and health of workers at work (89/391/EEC), 1989.

469 Cunningham, T.R., Sinclair, R., Schulte, P., 2014. Better understanding the small business
470 construct to advance research on delivering workplace health and safety. *Small*
471 *Enterp. Res.* 21, 148–160. <https://doi.org/10.1080/13215906.2014.11082084>
472 Cyprus Statistical Service, 2018. MONTHLY ECONOMIC INDICATORS (Bulletin), JAN-DEC 2018
473 (EN). Ministry of Finance, Republic of Cyprus, Nicosia.

474 Eardley, A., Avison, D., Powell, P., 1997. Developing Information Systems to Support Flexible
475 Strategy. *J. Organ. Comput. Electron. Commer.* 7, 57–77.
476 https://doi.org/10.1207/s15327744joce0701_4

477 EC - European Commission, 2004. Communication from the Commission to the European
478 Parliament, the Council, the European Economic and Social Committee and the
479 Committee of Regions on the practical implementation of the provisions of the
480 Health and Safety at Work Directives 89/391 (Framework), 89/654 (Workplaces),
481 89/655 (Work Equipment), 89/656 (Personal Protective Equipment), 90/269 (Manual
482 Handling of Loads) and 90/270 (Display Screen Equipment). COM/2004/0062 final.

483 EU-OSHA, 2019. Third European Survey of Enterprises on New and Emerging Risks (ESENER
484 3) - First Findings. EU-OSHA.

485 EU-OSHA, 2018a. OiRA Communication Guide.

486 EU-OSHA, 2018b. Safety and Health in micro and small enterprises in the EU: Final report
487 from the 3-year SESAME project (No. ISSN: 1831-9343). EU-OSHA, Luxembourg.

488 EU-OSHA, 2015. European Survey of Enterprises on New and Emerging Risks – Managing
489 safety and health at work (ESENER). European Agency for Safety and Health at Work
490 (, Luxemburg: Office for Official Publications of the European Communities.

491 EU-OSHA, 2011. Worker Participation in Occupational Safety and Health. Publications Office
492 of the European Union, Luxembourg.

493 EU-OSHA, 2010. European Survey of Enterprises on New and Emerging Risks – Managing
494 safety and health at work (ESENER). European Agency for Safety and Health at Work,
495 Luxemburg: Office for Official Publications of the European Communities.

496 EU-OSHA – European Agency for Safety and Health at Work, 2009. Occupational safety and
497 health and economic performance in small and medium-sized enterprises: A review.

498 European Commission, 2003. Commission Recommendation of 6 May 2003 concerning the
499 definition of micro, small and medium-sized enterprises (2003/361/EC).

500 European Union Labour Force Survey - Eurostat [WWW Document], 2016. URL
501 <http://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey>
502 (accessed 7.15.16).

503 Eurostat, 2004. Statistical Analysis of Socio-economic Costs of Accidents at Work in the
504 European Union.

505 Fabiano, B., Currò, F., Pastorino, R., 2004. A study of the relationship between occupational
506 injuries and firm size and type in the Italian industry. *Saf. Sci.* 42, 587–600.
507 <https://doi.org/10.1016/j.ssci.2003.09.003>

508 Frick, K., Walters, D., 1998. Worker Representation on Health and Safety in Small
509 Enterprises: Lessons from a Swedish Approach. *Int. Labour Rev.* 137, 367.

510 Gadd, S.A., Keeley, D.M., Balmforth, H.F., 2004. Pitfalls in risk assessment: examples from
511 the UK. *Saf. Sci.* 42, 841–857. <https://doi.org/10.1016/j.ssci.2004.03.003>

512 Gallagher, C., Underhill, E., Rimmer, M., 2003. Occupational safety and health management
513 systems in Australia: barriers to success. *Policy Pract. Health Saf.* 1, 67–81.
514 <https://doi.org/10.1080/14774003.2003.11667637>

515 Giordano, C., 2012. The Anthropology of Mediterranean Societies, in: *A Companion to the*
516 *Anthropology of Europe*. John Wiley & Sons, Ltd, pp. 11–31.
517 <https://doi.org/10.1002/9781118257203.ch2>

518 Glendon, A.I., Booth, R.T., 1982. Worker Participation in Occupational Health and Safety in
519 Britain. *Int. Labour Rev.* 121, 399.

520 Hasle, P., Limborg, H.J., 2006. A review of the literature on preventive occupational health
521 and safety activities in small enterprises. *Ind. Health* 44, 6–12.
522 <https://doi.org/10.2486/indhealth.44.6>

523 Health and Safety Executive (HSE), 2001. *Reducing Risks, Protecting People- HSE’s Decision*
524 *Making Process*. C100, HSE Books, Sudbury, Suffolk, UK.

525 Hofstede, G., 1983. The Cultural Relativity of Organizational Practices and Theories. *J. Int.*
526 *Bus. Stud.* 14, 75–89. <https://doi.org/10.1057/palgrave.jibs.8490867>

527 ISO, 2018. *ISO 31000:2018 Risk management - Principles and guidelines*.

528 Jeffries, F.L., 2011. Predicting Safety Related Attitudes in the Workplace: The Influence of
529 Moral Maturity and Emotional Intelligence.

530 Jensen, P.L., Alstrup, L., Thoft, E., 2001. Workplace assessment: a tool for occupational
531 health and safety management in small firms? *Appl. Ergon.* 32, 433–440.
532 [https://doi.org/10.1016/S0003-6870\(01\)00037-0](https://doi.org/10.1016/S0003-6870(01)00037-0)

533 Klinke, A., Renn, O., 2002. A New Approach to Risk Evaluation and Management: Risk-Based,
534 Precaution-Based, and Discourse-Based Strategies1. *Risk Anal.* 22, 1071–1094.
535 <https://doi.org/10.1111/1539-6924.00274>

536 Lenhardt, U., Beck, D., 2016. Prevalence and quality of workplace risk assessments – Findings
537 from a representative company survey in Germany. *Saf. Sci.* 86, 48–56.
538 <https://doi.org/10.1016/j.ssci.2016.02.017>

539 Marhavilas, P.K., Koulouriotis, D., Gemeni, V., 2011. Risk analysis and assessment
540 methodologies in the work sites: On a review, classification and comparative study
541 of the scientific literature of the period 2000–2009. *J. Loss Prev. Process Ind.* 24,
542 477–523. <https://doi.org/10.1016/j.jlp.2011.03.004>

543 Micheli, G.J.L., Cagno, E., 2010. Dealing with SMEs as a whole in OHS issues: Warnings from
544 empirical evidence. *Saf. Sci.* 48, 729–733. <https://doi.org/10.1016/j.ssci.2010.02.010>

545 Mohaghegh, Z., Kazemi, R., Mosleh, A., 2009. Incorporating organizational factors into
546 Probabilistic Risk Assessment (PRA) of complex socio-technical systems: A hybrid
547 technique formalization. *Reliab. Eng. Syst. Saf.* 94, 1000–1018.
548 <https://doi.org/10.1016/j.ress.2008.11.006>

549 Parker, D., Brosseau, L., Samant, Y., PhD, W.P., Xi, M., Haugan, D., 2007. A comparison of the
550 perceptions and beliefs of workers and owners with regard to workplace safety in
551 small metal fabrication businesses. *Am. J. Ind. Med.* 50, 999–1009.
552 <https://doi.org/10.1002/ajim.20508>

553 Popma, J.R., 2009. Does Worker Participation Improve Health and Safety? Findings from the
554 Netherlands. *Policy Pract. Health Saf.* 7, 33–51.
555 <https://doi.org/10.1080/14774003.2009.11667727>

556 Probst, T.M., Estrada, A.X., 2010. Accident under-reporting among employees: Testing the
557 moderating influence of psychological safety climate and supervisor enforcement of
558 safety practices. *Accid. Anal. Prev., Safety Climate: New Developments in*
559 *Conceptualization, Theory, and Research* 42, 1438–1444.
560 <https://doi.org/10.1016/j.aap.2009.06.027>

561 Reader, T., 2019. The interaction between safety culture and national culture, in: *Safety*
562 *Science Research: Evolution, Challenges and New Directions*. CRC Press, p. 326.

563 Reinhold, K., Järvis, M., Tint, P., 2015. Practical tool and procedure for workplace risk
564 assessment: Evidence from SMEs in Estonia. *Saf. Sci., Managing Safety in Small and*
565 *Medium Enterprises* 71, 282–291. <https://doi.org/10.1016/j.ssci.2014.09.016>

566 Santos, G., Barros, S., Mendes, F., Lopes, N., 2013. The main benefits associated with health
567 and safety management systems certification in Portuguese small and medium
568 enterprises post quality management system certification. *Saf. Sci.* 51, 29–36.
569 <https://doi.org/10.1016/j.ssci.2012.06.014>

570 Schulte, P.A., Cunningham, T.R., Guerin, R.J., Hennigan, B., Jacklitsch, B., 2018. Components
571 of an Occupational Safety and Health Communication Research Strategy for Small-
572 and Medium-Sized Enterprises. *Ann. Work Expo. Health* 62, S12–S24.
573 <https://doi.org/10.1093/annweh/wxy054>
574 SEPE, 2013. Annual Report 2012. Hellenic Labour Inspectorate.
575 Slovic, P. (Ed.), 2000. *The Perception of Risk*. Earthscan, Virginia.
576 Slovic, P., Fischhoff, B., Lichtenstein, S., 1982. Why Study Risk Perception? *Risk Anal.* 2, 83–
577 93. <https://doi.org/10.1111/j.1539-6924.1982.tb01369.x>
578 Sørensen, O.H., Hasle, P., Bach, E., 2007. Working in small enterprises - Is there a special
579 risk? *Saf. Sci.* 45, 1044–1059. <https://doi.org/10.1016/j.ssci.2006.09.005>
580 Vassie, L., Tomàs, J.M., Oliver, A., 2000. Health and Safety Management in UK and Spanish
581 SMEs: A Comparative Study. *J. Safety Res.* 31, 35–43.
582 [https://doi.org/10.1016/S0022-4375\(99\)00028-6](https://doi.org/10.1016/S0022-4375(99)00028-6)
583 Wadsworth, E., Walters, D., 2018. From policy to practice: Safety and Health in Micro and
584 Small Enterprises in the EU, European Risk Observatory. European Agency for Safety
585 and Health at Work.
586 Walters, D., 2004. Worker representation and health and safety in small enterprises in
587 Europe. *Ind. Relat. J.* 35, 169–186. [https://doi.org/10.1111/j.1468-](https://doi.org/10.1111/j.1468-2338.2004.00307.x)
588 [2338.2004.00307.x](https://doi.org/10.1111/j.1468-2338.2004.00307.x)
589 Walters, D., 2001. *Health and Safety in Small Enterprises: European Strategies for Managing*
590 *Improvement (SALTSA)*. P.I.E. – Peter Lang, Brussels.
591 WHO, 2002. *Good practice in occupational health services : a contribution to workplace*
592 *health*.
593
594

Table 1. Responses to ESENER-2 risk assessment related questions for the cases of Cyprus, Mediterranean countries and Nordic countries.	Cyprus	Mediterranean	Nordic	Comparison
<i>Q250: Do you regularly carry out workplace risk assessments?#</i>				
YES	446 (59.4%)	7928 (82.3%)	5154 (85.2%)	$\chi^2(2) = 22.03, p < .001$
NO	284 (37.8%)	1622 (16.8%)	855 (14.1%)	
<i>Q251: Are workplace risk assessments mainly conducted by internal staff or external service providers? #</i>				
Internal Staff	198 (44.4%)	1936 (24.2%)	3888 (74.8%)	$\chi^2(3) = 3697.44, p < .001$
External Providers	122 (27.6%)	4656 (58.1%)	527 (10.1%)	
Both equally	124 (27.8%)	1326 (16.6%)	726 (13.9%)	
<i>Q254gr: Year of last risk assessment (revision)^</i>				
before 2010	5 (1.1%)	65 (0.8%)	27 (0.52%)	$U(7) = 50.06, p = .177$
2010	5 (1.1%)	61 (0.8%)	43 (0.8%)	
2011	7 (1.6%)	154 (1.9%)	137 (2.7%)	
2012	42 (9.4%)	509 (6.4%)	434 (8.4%)	
2013	173 (38.8%)	2673 (33.7%)	1600 (31.1%)	
2014	198 (44.4%)	4216 (53.2%)	2787 (54.1%)	
don't know	14 (3.1%)	228 (2.9%)	101 (1.9%)	
<i>Q256_1: provided with the findings: management#</i>				
YES	398 (89.7%)	7448 (93.9%)	4920 (95.5%)	$\chi^2(2) = 19.46, p < .001$
NO	22 (4.9%)	313 (3.9%)	149 (2.9%)	
<i>Q256_5: provided with the findings: employees themselves#</i>				
YES	327 (73.7%)	5466 (68.9%)	4377 (84.9%)	$\chi^2(2) = 466.18, p < .001$
NO	89 (20.1%)	2206 (27.9%)	623 (12.1%)	
<i>Q259: In your establishment, is the risk assessment procedure seen as a useful way of managing health and safety?#</i>				
YES	420 (94.2%)	7474 (94.3%)	4521 (87.7%)	$\chi^2(3) = 229.98, p < .001$
NO	22 (4.9%)	304 (3.8%)	285 (5.5%)	
There are conflicting views about that	3 (0.7%)	107 (1.4%)	268 (5.2%)	

595
596
597
598

Chi-square was used to identify differences between Mediterranean and Nordic countries.

^ Mann-Whitney U test was used to identify differences between Mediterranean and Nordic countries.

Note. Some values do not sum to 100% because not all respondents answered every question.

599 **Table 2.** Correlation between perceived importance of risk assessment and workplace or OSH
 600 parameters.

	Spearman's rho	<i>p</i>
Use of external OSH Services ^	.19	.008
Lack of time or staff #	.03	.664
Lack of expertise or specialist support #	.01	.875
Current economic situation of this establishment #	.01	.898
Lack of money #	.01	.971
Lack of awareness among management #	-.04	.565
Number of employees	-.05	.462
Number of years in operation	-.07	.325
The paper-work #	-.11	.130
The complexity of legal obligations #	-.15	.035
The degree of involvement of employees or their representatives #	.18	.012

601 ^ No=0, Yes=1
 602 # Likert scale 1-7.

603 **Table 3.** Regression analysis between perceived importance of risk assessment and
 604 workplace/OSH specific variables.

Parameters ($R^2=0.089$)	Stand. Beta	<i>t</i>	<i>p</i>	95% CI
(Constant)		5.24	<.001	
Use of external OSH Services [^]	0.23	3.18	.002	[0.09, 0.37]
Degree of involvement of employees or their representatives [#]	0.19	2.52	.013	[0.04, 0.34]

605 [^] No=0, Yes=1
 606 [#] Likert scale 1-7