

The extent and influence of Asbestos Safety Awareness training among managers who had previously commissioned an asbestos survey in their workplace buildings

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Abstract: A telephone survey was conducted among a sample of managers (n=30) in Ireland who had previously commissioned an asbestos survey in their workplace buildings. The aims of the telephone survey were to examine the extent to which managers had completed Asbestos Safety Awareness (ASA) training, and to assess how such training might influence (i) their instinctive thoughts on asbestos, and (ii) their approach to aspects of asbestos management within their buildings. Managers' motivations for commissioning the asbestos survey were also identified. The study found that ASA-trained managers (n=11) were not significantly more likely to work in larger organisations or in organisations which operated an accredited management system. Though ASA-trained managers' instinctive thoughts on asbestos were of a slightly poorer technical quality compared with those of non-ASA-trained managers, they were still significantly more cognisant of their responsibilities towards those of their employees at specific risk of asbestos exposure. Most managers (n=28) commissioned the asbestos survey to satisfy a pre-requisite of external contractors for commencing refurbishment/demolition work in their buildings. Given its potential to positively influence the occupational management of asbestos, the authors recommend the general promotion of suitably tailored ASA-training programmes among building managers and external contractors alike.

Key words: Asbestos safety awareness training, Buildings, Occupational health and safety, Occupational management of asbestos

Introduction

The many desirable properties of asbestos (strength, durability, flexibility and resistance to corrosion, heat and fire) have promoted its widespread commercial use as a building material for over 100 yr^{1–3}. It has also been used

as a component in many other materials; examples of these so-called 'asbestos-containing materials' (ACMs) include asbestos cement products (used, for example, in roofing and cladding), textured or spray coatings for ceilings/walls/beams/columns, floor tiles, textiles, asbestos insulation board (AIB) and thermal lagging for boilers, pipes, etc⁴). Asbestos and ACMs are safe when intact and in good condition. However, when damaged (and therefore friable) they release airborne fibres which, if inhaled, can lead to the following terminal conditions: lung cancer, mesothe-

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lioma and asbestosis. Respectively, it has been estimated that these three diseases caused approximately 41,000, 59,000 and 7,000 deaths globally in 2004⁵. Because of the long latency (decades) between exposure and disease manifestation, many of these fatalities have resulted from occupational exposure to asbestos which occurred during the first two-thirds of the twentieth century, among workers who were, for the most part, fully aware that they were being exposed to asbestos in the course of their work activities. Examples of such activities included asbestos mining and milling, insulation work, shipyard work, construction and asbestos textile manufacture⁶. In its survey of asbestos workers from 1971 to 2005, the UK's Health and Safety Executive (HSE) found that asbestos workers had a statistically significant excess of deaths compared with the UK population, where the highest mortalities for cancer of the stomach, peritoneum/pleura and mesothelioma occurred 40–59 yr after first exposure to asbestos⁷.

Even though the hazardous properties of asbestos were known in the first half of the twentieth century⁸, it was not until the 1980s and '90s that developed countries enacted legislation (on a phased basis) to control, restrict and ultimately ban the use of asbestos. For example, over the years among European countries there has been a "geographical diffusion" of asbestos ban policies from Nordic to Western countries and then onwards to other European countries⁹. In this context, asbestos products have been banned in all countries of the European Union since 2005, even though bans existed in some member states prior to this: 1986 in Sweden, 1994 in the Netherlands, 1997 in France and 1999 in the UK⁶. When coupled with the aforementioned long latency periods to diagnosis, this "legislative time lag" means that mortality from asbestos related diseases (ARDs) has yet to peak. By 2007 in the UK at least 3,500 people were dying each year from ARDs, making asbestos the UK's single greatest cause of work related fatalities¹⁰. Additionally, the HSE has projected that it will be 2016 before the UK's mesothelioma mortality rate (males) peaks at ca. 2,040 deaths, and that ca. 91,000 deaths will have occurred by 2050, with ca. 61,000 of these occurring from 2007 onwards¹¹.

One consequence of the legislative efforts undertaken in developed countries is the observation in more recent times of a shift in the nature of occupational exposure to asbestos, namely, away from those who knowingly work with asbestos and towards those who work in maintenance activities or remediation of buildings that contain asbestos¹². The HSE states that the group of workers now most at risk of contracting ARDs includes those who

work in a range of construction/maintenance related trades on buildings built or refurbished between the 1950s and the 1970s¹⁰. Of particular concern is the possibility that some within this cohort may be unknowingly (and possibly frequently) exposed to ACMs. This was highlighted in a 2007 study conducted by Bard and Burdett which examined the awareness of industrial plumbers in the UK to their occupational exposure to asbestos. They found that even though only ca. 20% of the participating plumbers reported to have knowingly worked with ACMs during the study period, in reality ca. 60% of them had been exposed to ACMs based on the positive identification of asbestos fibres on the passive samplers they had worn during the study period¹³. This finding remains relevant given that any building built or refurbished in the UK before 2000 (when the outright ban came into force) may contain asbestos¹⁴.

In light of the above—and, as a complement to the standard blend of (i) regulatory enforcement of occupational exposure limits, (ii) licensing requirements, (iii) approved codes of practice, and (iv) best practice guidance documents—the HSE launched a two month media campaign in 2008 entitled "Asbestos: The Hidden Killer" to help raise awareness of the latent, yet insidious, threat posed by extant asbestos in workplace buildings among tradespeople in the UK¹⁵. Thereafter, in 2011 the HSE developed "The Asbestos Training Pledge Initiative" in collaboration with industry training providers to increase access to training for those tradespeople most at risk¹⁶. Notwithstanding the above, the UK's *Control of Asbestos Regulations 2012* defines that employers must ensure that adequate information, instruction and training is given to those employees who are, or are liable to be, exposed to asbestos during the course of their work.

In the specific case of Ireland, the use of asbestos and ACMs was banned on a phased basis under legislation enacted in 1994 and 1998, with a general prohibition introduced under the *European Communities (Dangerous Substances and Preparations) (Marketing and Use) Regulations 2000*. In keeping with other jurisdictions, the Health and Safety Authority (HSA—the statutory body responsible for workplace health and safety in Ireland) acknowledges the potential for 'in situ' asbestos in any workplace building constructed prior to 2000¹⁷.

Occupational exposure to asbestos in Ireland is principally regulated under the *Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006 and 2010*. Similar to the UK, these regulations impose duties on employers regarding the provision of training and information

to those employees liable to exposure to asbestos. This training and information should include: the properties, hazards and health risks associated with asbestos, the types of products likely to contain asbestos, safe work practices, control measures, protective equipment, decontamination and emergency procedures, and waste disposal¹⁸. The authors have chosen here the term ‘Asbestos Safety Awareness (ASA) training’ to describe this training, and it is against the backdrop of the above legal duty imposed on employers that this present study was performed. In this regard, a specific cohort of managers was targeted for the study, namely those who had previously commissioned an asbestos survey in their workplace buildings. It was the authors’ contention that such managers would more than likely have commissioned such a survey on the belief or clear suspicion that their buildings contained asbestos, and as a consequence would likely have a legal duty to provide ASA training to those of their employees potentially liable to asbestos exposure. The authors were therefore interested in gaining some insight into these managers’ general thoughts on asbestos. Thereafter, the aims were to quantify the extent to which these managers might themselves have completed ASA training and whether this correlated with either the size or the ‘management system accreditation status’ of their organisations. The aim was then to examine the influence that the completion of ASA training might have on them in the context of:

(i) whether they were more likely than non-ASA-trained managers to express instinctive thoughts on asbestos that were of a higher technical nature,

(ii) whether they were more cognisant than non-ASA-trained managers of their general responsibility to protect their employees from asbestos-related health issues, and

(iii) whether their own completion of ASA training would encourage them to ensure that those of their employees liable to asbestos exposure were similarly trained; and, additionally in this context, whether any correlation existed between the completion of employee ASA training and the size or the ‘management system accreditation status’ of their organisations.

The final aim was to establish the motivation(s) of the managers for commissioning the asbestos survey in their buildings.

Methods

A telephone survey, comprising a questionnaire of nine short questions (Appendix 1), was conducted to explore the research aims.

Study group selection

The specific sample of managers was selected in collaboration with an independent asbestos consultancy company, Phoenix Environmental Safety Ltd., located in the south east of Ireland. 70 organisations were randomly selected from the full list of 344 client organisations on the consultancy company’s database, and telephone contact was made requesting participation in the study. Of these, managers from 30 different organisations (8.7% of the total database) gave their informed consent to participate, with all 30 meeting the single acceptance criterion for the study, namely, of having previously engaged the services of the consultancy company to conduct an asbestos survey within their buildings.

No attempt was made during the selection of the study group or during the telephone survey that followed to establish a more comprehensive profile of these managers in terms of, for example, their educational background, the extent of their occupational experience, their gender, age and so on. The authors acknowledge this as a limitation of the study given the effect such variables may have had on the data obtained during the telephone survey. The authors further acknowledge the limitations imposed by the small size of the study group insofar as it stymies consideration of such confounding variables as organisational sizes and managers’ backgrounds. In mitigation, the authors suspect that this small sample size may be reflective of an underlying reluctance among some building managers to engage with third parties on what they may consider to be the sensitive issue of asbestos in their buildings.

Survey development and delivery

A telephone survey was chosen as the means of engaging with participants in preference to the distribution of hardcopy questionnaires via post because (i) the response rate from postal surveys tends to be poor¹⁹, and (ii) the telephone contact details were readily available from the Phoenix Environmental Safety Ltd. database. With the intention of being concise, targeted and suitable for delivery via telephone survey, the questionnaire was developed with reference to guidelines promoted by Fink¹⁹. Throughout the process of drafting the questionnaire, effort was made to draft questions in a conversational style where possible, with the aim of putting participants at ease during the telephone survey. In total, nine short questions were included—eight of them being multiple choice, closed-ended and one being open-ended. The first three questions focused on the following three organisational demographics: industrial sector, number of employees and

whether the organisation operated an accredited management system (for example ISO 9001, ISO 14001, OHSAS 18001, etc.). Question 4 (the only open-ended question in the questionnaire) endeavoured to capture managers' instinctive thoughts on asbestos by simply asking "What is the first word or phrase that comes to mind when you hear the word 'asbestos'?" Questions 5 and 6 probed the sources of managers' knowledge on asbestos, while Question 7 aimed to gauge their general opinion(s) on the issue of asbestos with reference to a selection of six brief pre-defined statements. Question 8 focused on their motivation(s) for commissioning the asbestos survey in their buildings, and Question 9 asked the managers to confirm whether or not those of their employees deemed likely to disturb ACMs (in particular those engaged in maintenance and repairs) had completed ASA training.

The questionnaire was tested for validity in a pilot (n=5 participants); none of the pilot responses was included as part of the final study. Based on comments from the pilot participants, a small number of syntax and phrasing adjustments were made to some of the questions to improve their clarity and ease of understanding. Thereafter, following approval by the Research Ethics Committee (Faculty of Science and Engineering, University of Limerick), the final questionnaire was delivered via telephone survey during February 2013.

Data analysis

All variables were summarised and the associations between various variables were tested for using χ^2 tests where appropriate; however, Fisher's exact tests were used where numbers were low. Software used was IBM SPSS Statistics (version 20 for Windows, IBM Corporation, Somers, NY, USA).

Results

Tables 1 and 2 display information on the organisational characteristics pertaining to the study sample of building managers who agreed to participate in the survey (n=30). Participants were spread across a range of organisational sizes and sectors, with just under half of the organisations (46.7%, n=14) operating an accredited management system. The health services sector was particularly well represented (n=9, 30%). This may relate to the particular age profile of hospital buildings in Ireland which is likely to predispose them to the presence of ACMs. In this context, Version 1 (2006) of the Corporate Safety Statement for Ireland's Health Service Executive (the statutory body

Table 1. Organisational characteristics pertaining to the study sample of building managers according to industrial sector

Industrial sector	No. of organisations (%)
Agriculture	3 (10%)
Chemical production	3 (10%)
Construction	4 (13.3%)
Education	2 (6.7%)
Engineering	0 (0%)
Financial services	1 (3.3%)
Food production	1 (3.3%)
Health services	9 (30%)
Information Technology	0 (0%)
Local government authority	2 (6.7%)
Manufacturing	0 (0%)
Pharmaceutical production	1 (3.3%)
Retail	4 (13.3%)
Other	0 (0%)
Total	30

Table 2. Organisational characteristics pertaining to the study sample of building managers according to number of employees and management system accreditation status

Number of employees	Number and percentage of organisations	Number and percentage of organisations operating an accredited management system
1-20	7 (23.3%)	0 out of 7 (0%)
21-100	9 (30.0%)	2 out of 9 (22.2%)
101-200	5 (16.7%)	4 out of 5 (80%)
>200	9 (30.0%)	8 out of 9 (88.9%)
Total	30 (100%)	14 out of 30 (46.7%)

responsible for the provision of public health services in Ireland) included asbestos on a short yet specific list of workplace hazards deemed particularly worthy of attention in the context of risk assessment²⁰. (The current version of this document, Version 4, is written to a revised format and, as such, no longer includes this list²¹). Of the total sample of 30 managers, 11 (36.7%) confirmed that they had previously completed ASA training, with the remaining 19 (63.3%) being non-ASA-trained. The extent to which managers were ASA-trained was analysed versus (i) the size of their organisation, and (ii) whether or not their organisation operated an accredited management system, for example ISO 9001, etc. The summary of these analyses is presented in Figs. 1 and 2 respectively. Statistical analysis of the data found that no significant association existed between the size of the organisation and the likelihood of the manager being ASA-trained



Fig. 1. The extent to which managers had completed ASA training in the context of organisation size.

The number of managers per organisation size is displayed beside each shaded bar. This number is also expressed as a percentage of the total number (n) of managers in that cohort, where $n=11$ for ASA-trained managers and $n=19$ for non-ASA-trained managers. $p=0.796$, Fisher's exact test for significant association between organisation size and a manager being ASA-trained.

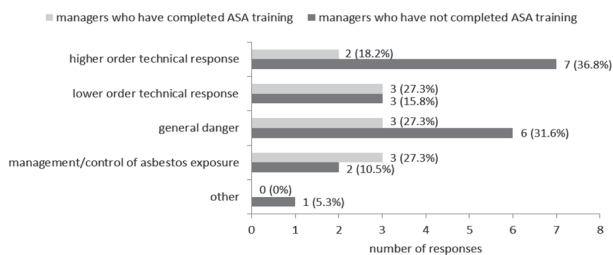


Fig. 3. Managers' instinctive thoughts on asbestos in the context of the categorisation of their 'first word or phrase' response.

The number of managers per category of response is displayed beside each shaded bar. This number is also expressed as a percentage of the total number (n) of managers in that cohort, where $n=11$ for ASA-trained managers and $n=19$ for non-ASA-trained managers. $p=1.00$, Fisher's exact test for significant association between the articulation of a higher or lower order technical response and a manager being ASA-trained.

[$p=0.796$, Fisher's exact test]. Furthermore, even though ASA-trained managers were more likely to be found in organisations which operated an accredited management system (63.6%, 7 out of 11), no significant association existed [$p=0.257$, Fisher's exact test].

Managers' instinctive thoughts on asbestos were examined via analysis of their responses to the open-ended question "What is the first word or phrase that comes to mind when you hear the word 'asbestos'?" This analysis was facilitated by coding their various 'first word or phrase' responses as follows. Responses which contained clear and specific reference to cancer(s) of the lungs were categorised as *higher order technical* responses, whereas those containing less specific technical information (such as 'lung problems', 'bad for your lungs' and 'dangerous dusts') were categorised as *lower order technical*

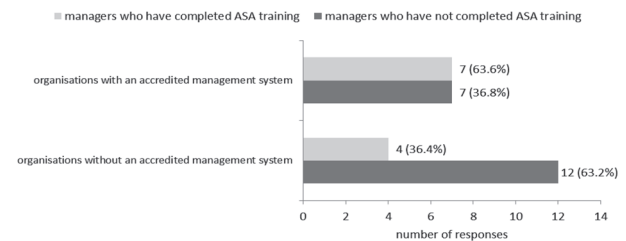


Fig. 2. The extent to which managers had completed ASA training in the context of the operation of an accredited management system within their organisation.

The number of managers in each organisation category is displayed beside each shaded bar. This number is also expressed as a percentage of the total number (n) of managers in that cohort, where $n=11$ for ASA-trained managers and $n=19$ for non-ASA-trained managers. $p=0.257$, Fisher's exact test for significant association between the operation of an accredited management system within an organisation and a manager being ASA-trained.

responses. A third category comprised responses which alluded, in general terms only, to the fact that asbestos was 'dangerous'. A fourth category was comprised of those responses which focused solely on issues pertaining to the management and control of exposure to asbestos. A fifth category was provided for all other comments, of which there was only one which related to a specific commercially available brand of slate/roofing product. In the context of these five categories of responses, Fig. 3 provides a summary of managers' instinctive thoughts. As can be seen, half (15 out of 30) of all managers' 'first word or phrase' responses were of a technical nature (that is, either of a higher or lower order). However, further statistical analysis of the data revealed that ASA-trained managers were not significantly more likely to provide a higher or lower order technical response than their non-ASA-trained counterparts [$p=1.00$, Fisher's exact test]. On the contrary, 52.6% (10 out of 19) of non-ASA-trained managers gave a higher or lower order technical response compared with only 45.5% (5 out of 11) of ASA-trained managers.

To complement the open-ended question about their instinctive thoughts on asbestos, managers were also asked a multiple-choice, closed-ended question in which they gave their opinion(s) on asbestos by selecting one or more statements from a pre-defined set. Their responses are summarised in Fig. 4. Even though two non-ASA-trained managers felt that 'there was not much asbestos remaining in the country', it is clear that all 30 managers (ASA-trained and non-ASA-trained) acknowledged the hazardous nature of asbestos, and none felt that the dangers of asbestos were over-exaggerated.

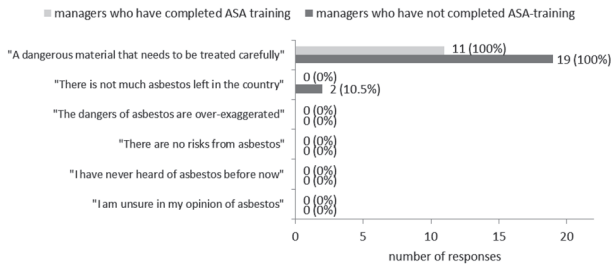


Fig. 4. Managers’ opinion(s) on asbestos based on their selection of statements from a pre-defined set—the selection of more than one statement was allowed.

The number of managers per opinion statement is displayed beside each shaded bar. This number is also expressed as a percentage of the total number (n) of managers in that cohort, where n=11 for ASA-trained managers and n=19 for non-ASA-trained managers.

Managers were asked to select any or all of the various sources of their current knowledge on asbestos (including ASA training) from the following pre-defined set: “ASA training”, “the internet”, “word of mouth”, “the media (television, radio, newspapers)”, “other, please specify”, and a final option stating that they did not have any knowledge of asbestos. Figure 5 summarises the findings. It is clear that ‘word of mouth’ features prominently among both cohorts of managers. However, further analysis identified that 42.1% of non-ASA-trained managers (8 out of 19) had cited ‘word of mouth’ as their only source of current knowledge. In contrast, ASA-trained managers were more likely to avail of a selection of knowledge sources, with just one manager (9.1%) relying only on ‘word of mouth’ (in addition to his/her ASA training). Statistical analysis of this finding confirmed that the likelihood of non-ASA-trained managers having received their knowledge of asbestos solely from ‘word of mouth’ was close to significant [$p=0.107$, Fishers exact test].

Managers were then asked to articulate their motivation(s) for commissioning the asbestos survey in their building by selecting as many statements as they deemed appropriate from the following pre-defined list: “it’s the law”, “out of responsibility for my employees’ health”, “undertaking refurbishment/demolition work and the contractors would not start works without an asbestos survey report”, “I have been made aware of the risks of asbestos and am now curious about my own building”, and “other, please specify”. Figure 6 summarises their responses. 26.7% (n=8) of all managers cited legal compliance as one of their motivations, while 53.3% (n=16) commissioned the asbestos survey in keeping with their responsibility to protect employees’ health while at work. When this latter finding



Fig. 5. The various sources of managers’ current knowledge of asbestos—the selection of more than one source was allowed.

The number of managers per source of current knowledge is displayed beside each shaded bar. This number is also expressed as a percentage of the total number (n) of managers in that cohort, where n=11 for ASA-trained managers and n=19 for non-ASA-trained managers. $p=0.107$, Fisher’s exact test for significant association between “word of mouth” as the sole source of knowledge and a manager being ASA-trained.

was analysed in more detail, ASA-trained managers (100%, 11 out of 11) were found to be significantly more likely than non-ASA-trained managers (26.3%, 5 out of 19) to cite responsibility for employees’ health as a motivating factor [$p<0.001$, Fisher’s exact test]; a Cramer’s V of 0.712 further affirms this strong association. (The solitary motivation in the “other, please specify” category came from a non-ASA-trained manager and referred to ‘industrial relations issues’.) Notwithstanding the above observations, the data clearly indicate that the most significant motivation across both manager cohorts (93.3%, n=28) was the refusal of external contractors to begin refurbishment/demolition works in the absence of an asbestos survey being undertaken in advance.

As outlined in the Introduction, Irish employers have a legal duty to provide training and information to those of their employees at risk of exposure to asbestos in the workplace. In this regard, Fig. 7 summarises managers’ responses when asked to confirm whether or not their relevant employees (for example, maintenance/repair workers) had received ASA training. 100% of ASA-trained managers (11 out of 11) stated that their relevant employees had received ASA training compared to only 31.6% of non-ASA trained managers (6 out of 19). The significance of this result was confirmed via a Fisher’s exact test of $p=0.000$, with the strong association between the two variables being reinforced by the corresponding Cramer’s V of 0.665. The extent to which relevant employees were ASA-trained was also analysed versus (i) the size of the organisation, and (ii) whether or not the organisation operated an accredited management system, for example ISO 9001, etc. The summary of these analyses is presented in



Fig. 6. The various motivations of managers for commissioning the asbestos survey in their building—the selection of more than one motivation was allowed.

The number of managers who selected a particular motivation is displayed within its respective shaded bar; the percentage in square brackets is the combined number of managers (i.e. ASA trained and non-ASA trained) who selected a particular motivation expressed as a percentage of the total number of managers (n=30). $p < 0.001$, Fisher's exact test for significant association between citing "responsibility for my employees' health" and a manager being ASA-trained (Cramer's $V = 0.712$).

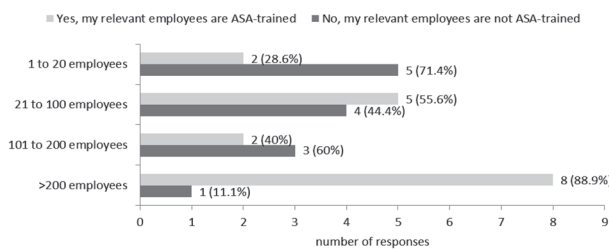


Fig. 8. The extent to which relevant employees (i.e. employees liable to asbestos exposure) have received ASA training in the context of organisation size.

The number of organisations per employee group is displayed beside each shaded bar. This number is also expressed as a percentage of the total number of organisations (n) in that size category, where n=7 for '1 to 20 employees', n=9 for '21 to 100 employees', n=5 for '101 to 200 employees', and n=9 for '>200 employees'. $p = 0.089$, Fisher's exact test for significant association between organisation size and the relevant employees being ASA-trained ($p = 0.025$, Linear-by-Linear Association).



Fig. 7. The extent to which managers have ensured that their relevant employees (i.e. employees liable to asbestos exposure) have received ASA training.

The number of managers per employee group is displayed beside each shaded bar. This number is also expressed as a percentage of the total number (n) of managers in that cohort, where n=11 for ASA-trained managers and n=19 for non-ASA-trained managers. $p = 0.000$, Fisher's exact test for significant association between a manager's relevant employees being ASA-trained and the manager being ASA-trained (Cramer's $V = 0.665$).

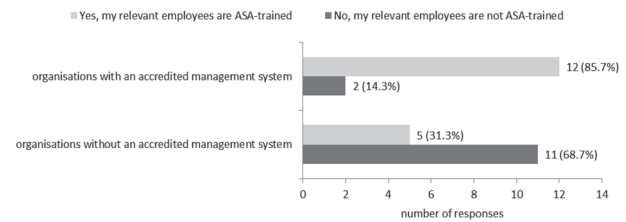


Fig. 9. The extent to which relevant employees (i.e. employees liable to asbestos exposure) have received ASA training in the context of the operation of an accredited management system within their organisations.

The number of organisations per employee group is displayed beside each shaded bar. This number is also expressed as a percentage of the total number of organisations (n) in that cohort, where n=14 for those with an accredited management system and n=16 for those without an accredited management system. $p = 0.004$, Fisher's exact test for significant association between the operation of an accredited management system within an organisation and the relevant employees being ASA-trained (Cramer's $V = 0.55$).

Figs. 8 and 9 respectively. The association between organisation size and the likelihood of all relevant employees being ASA-trained was found to be close to significant [$p = 0.089$, Fisher's exact test]; a linear association was also found whereby the percentage of ASA-trained employees increased as the size of the organisation increased [$p = 0.025$, Linear-by-Linear Association]. Relevant employees were significantly more likely to be ASA-trained in organisations operating an accredited management system [$p = 0.004$, Fisher's exact test], with a Cramer's V of 0.55 further highlighting the strong association between the two variables.

Discussion

36.7% of all surveyed managers were found to have completed ASA training. Is this an acceptable completion rate given (a) that all managers acknowledged the hazardous nature of asbestos, with none feeling that the dangers of asbestos were over-exaggerated, and (b) the authors' contention that all managers most likely believed or suspected the presence of asbestos in their buildings? Informed by the work of Briggs *et al.* it could be argued that such a completion rate ought to be higher. Their study focused on a sample of key position holders in the Australia

lian construction industry including CEOs, senior managers, construction/operations managers and site managers. It proposed a Framework for Safety Competency for these key position holders—requiring aptitude across four broad factors, namely (i) level of safety knowledge, (ii) leadership behaviour, (iii) interpersonal communication skills, and (iv) safety attitudes/values/beliefs. Of these, they cited the fundamental importance of safety knowledge (and the ability to identify and manage risk) insofar as it helps managers ‘to understand what they can and should be doing’²²⁾. Further evidence to support a higher completion rate for ASA training among the surveyed managers comes from a study by Stokols *et al.* Their study, involving a sample of Californian business managers, identified an improvement in managers’ awareness of and corporate compliance with state-wide OHS regulations following their participation in a related OHS-relevant managerial training program²³⁾. By way of counter argument, however, given the predominantly strategic/organisational role of managers (as opposed to one requiring ‘hands-on’ participation in day-to-day work activities), it could be argued as being unrealistic for them to be trained to the same level of awareness across the potentially broad spectrum of hazards (including asbestos) as that needed for their employees working ‘at the coalface’. Therefore, perhaps a more reasonable expectation of managers is that they possess a general grounding in the OHS principles relevant to their organisation which can then be augmented by more focussed input from the OHS function within their organisation, as/when needed. On balance, therefore, the observed completion rate of 36.7% may not be unreasonable.

The survey found no significant association between the likelihood of a manager being ASA-trained and either the size of the organisation or whether the organisation operated an accredited management system. On this point, as stated above, managers in larger organisations are more likely to be formally resourced and supported via an OHS function^{24, 25)}. It could be argued that this makes their absolute need to complete ASA training less critical, even when working within organisations that operate an accredited management system. By contrast, managers in smaller organisations often have less resources and time available to deal with day-to-day issues in general and OHS issues in particular²⁶⁾. One might therefore expect them to find it more challenging to specifically prioritise, let alone participate in, an ASA training programme, even under the ‘good auspices’ of an accredited management system. While acknowledging the limitations of the small sample

size for this study, the authors contend that the above reasons may account for the observed absence of a significant association between the completion of ASA training among managers and either the size or the ‘management system accreditation status’ of the organisation.

When presented with a list of pre-defined statements relating to asbestos, all managers (whether ASA-trained or not) were in agreement as to the hazardous nature of the material. It was perhaps surprising, however, to find that ASA-trained managers did not demonstrate a better appreciation of asbestos-related issues at an instinctive technical level compared to non-ASA-trained managers, i.e. on the basis of their ‘first word or phrase’ thoughts on asbestos. Yet, when the comparison is extended further, ASA-trained managers were still (i) significantly more mindful of their responsibility to protect their employees’ health, and (ii) significantly more likely to ensure that their relevant employees (i.e. those at risk of asbestos exposure, such as maintenance/repair workers) were ASA-trained. In our attempts to assess the overall worth of ASA-training for managers, Aguinis and Kraiger provide guidance on the different benefits to individuals arising from training. They assert that apart from affecting ‘declarative knowledge’ or ‘procedural knowledge’, training may also enhance ‘strategic knowledge’. They describe declarative knowledge as knowledge about “what” (e.g. facts, meaning of terms), procedural knowledge as knowledge about “how” (e.g. how to perform skilled behaviour), and strategic knowledge as knowing “when” to apply a specific knowledge or skill²⁷⁾. While improved procedural knowledge is perhaps less relevant in the context of our present study, it could be argued that ASA-training did not help to improve ASA-trained managers’ declarative knowledge of asbestos-related issues. Indeed, non-ASA-trained managers appeared to be more technically aware at an instinctive level even though they were more likely to rely on ‘word of mouth’ as their sole source of knowledge. Despite this, the positive approach taken by ASA-trained managers (i.e. towards their employee health responsibilities and the provision of employee ASA-training) demonstrates a clear and tangible benefit of ASA-training in terms of the enhanced strategic knowledge it promoted on issues pertaining to the management of asbestos in their workplace buildings. Even though the survey did not provide data to examine the possible association between this enhanced strategic knowledge and an actual reduction in the risk of asbestos exposure to employees, the authors contend that the finding still provides evidence to support the completion of ASA training by building managers in general.

In July 2013, the HSA published “Asbestos-containing Materials (ACMs) in Workplaces—Practical Guidelines on ACM Management and Abatement”²⁸). In the context of the legal requirement for employers to provide adequate training and information to all employees who are, or are liable to be, exposed to asbestos, the guidelines recommend that such ‘basic asbestos awareness training’ will likely be theory-based, with a syllabus appropriate to the training and information requirements of the (*Exposure to Asbestos*) Regulations 2006 and 2010 outlined in the Introduction, and should be a minimum of one day’s duration. It could be argued that such a format and syllabus would also be beneficial to building managers. However, given the time constraints under which managers operate, a suitably abridged version—perhaps via an online format—may be more appropriate than the full one day’s classroom format recommended by the HSA for employees. In this regard, an abridged online ASA training package tailored specifically to employers/building managers might sit well within the HSA’s recently developed online educational platform, ‘hsalearning.ie’, which provides a range of free online health and safety courses aimed at improving awareness of workplace safety, health and welfare. These self-directed courses have been purposely designed with the aim of providing learners with the flexibility to study in their own time and at their own pace²⁹).

Additionally, it should not be forgotten that the likelihood of relevant employees being ASA-trained was also found to be significantly linked to the operation of an accredited management system within the organisation. Though this link was not found to be significant for their managers (for the reasons discussed earlier), the observation of a significant link for employees may be due (in part, at least) to the acknowledged improvements which accompany the successful implementation of an accredited management system within an organisation—for example: more clearly defined organisational structures, enhanced internal communication, standardisation of procedures, the systematic approach to employee training, etc^{30–34}).

Regardless of whether some managers cited legal compliance and/or responsibility for employee health as motivating factors for commissioning the asbestos survey in their buildings, the clear driving force in the vast majority of cases was the refusal of external contractors to commence refurbishment/demolition works in the absence of such a survey. While it could be argued that some building managers may perceive an asbestos survey as akin to “opening a can of worms”, one can imagine in the minds of those external contractors embarking upon

refurbishment or demolition works that such a survey is commensurate with the associated risk to their health. It is reasonable to assume that such external contractors possess some level of asbestos safety awareness, whether formal or informal. In a way, their reluctance to willingly “put themselves in harm’s way” resonates with the work of Lingard who studied the effect of First Aid training on the OHS motivation and risk control behaviour of Australian construction workers. The study found that the completion of First Aid training made the construction workers more aware that their experience of OHS risks was not beyond their control but that their own behaviour was an important factor in avoiding occupational injury and illness³⁵). In this present study, therefore, it would appear that those who are external to an organisation, yet who have most to lose in terms of their own health and well-being, have the potential to strongly influence the organisation’s internal asbestos management policy. In some respects, this resonates with the strategy behind the UK HSE’s “Asbestos Training Pledge Initiative” referred to in the Introduction. Therefore, a targeted campaign to promote ASA-training among independent building/maintenance contractors may, over time, provide a mechanism for improving the overall awareness of asbestos-related issues in the broader occupational context within organisations. In the Irish context, such a promotion campaign might be realised under the auspices of the Construction Safety Partnership (CSP). This body—which consists of employers, trade unions, industry representative organisations, professional bodies, government and state agencies (including the HSA)—seeks to promote continuous improvements in health and safety performance at all levels within the Irish construction industry.

Conclusion

This article describes a telephone survey which was conducted to examine the extent and influence of Asbestos Safety Awareness (ASA) training among a sample of 30 managers of Irish workplace buildings who had previously commissioned an asbestos survey in their buildings. The completion of this training by just over one third of the managers was found neither to correlate significantly with the size of their organisations nor with whether their organisations operated an accredited management system. Perhaps surprisingly, ASA-trained managers performed slightly poorer than their non-ASA-trained counterparts (though not significantly so) in terms of the technical quality of their instinctive thoughts on asbestos. Despite

this, they were still significantly more likely to ensure that those of their employees at risk of asbestos exposure (for example, maintenance/repair workers) were ASA-trained, although the operation of an accredited management system within an organisation was also seen to significantly influence this finding. In addition, ASA-trained managers displayed a significantly greater awareness of their general responsibility to protect their employees from asbestos-related health issues. In light of the above, the authors contend that ASA training has the potential to enhance managers' strategic knowledge on matters relating to the management of asbestos in their buildings. This finding provides evidence to support the widespread completion of ASA training among building managers in Ireland. However, given the time constraints under which many managers operate, the development of an abridged version—perhaps via an online format—may be more appropriate than the full one day's classroom format currently recommended in the Irish Health and Safety Authority's "Practical Guidelines on ACM Management and Abatement". Such an abridged online training course might sit well within the HSA's recently developed online educational platform, 'hsalearning.ie'.

Finally, the most common motivation among the managers for the commissioning of an asbestos survey in their buildings was the prior refusal of external contractors to commence refurbishment/demolition works in the buildings in the absence of such a survey. Arising from this, the authors propose that the targeted promotion of ASA training among such contractors may provide a means of improving the overall awareness of asbestos-related issues in workplace buildings in the broader occupational context; in this regard, the authors suggest that the Irish Construction Safety Partnership (an umbrella body of key stakeholders in the Irish construction sector) may be an appropriate conduit for such a targeted promotion.

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Appendix 1. The questionnaire delivered during the telephone survey

Question 1. Which industrial sector do you work in?

Agriculture, Chemical production, Construction, Education, Engineering, Financial services, Food production, Health services, Information Technology, Local government authority, Manufacturing, Pharmaceutical production, Retail, Other.

Question 2. What is the approximate number of employees in your organisation?

1–20, 21–100, 101–200, >200

Question 3. Does your organisation operate an accredited management system such as ISO9001, ISO14001, OHSAS 18001, etc?

Yes, No, I don't know

Question 4. What is the first word or phrase that comes to mind when you hear the word 'asbestos'?

Question 5. Have you ever received formal asbestos safety awareness training?

Yes, No

Question 6. Where did you receive your current knowledge of asbestos?

(you may choose one or more answers)

asbestos safety awareness course; the internet; word of mouth; the media (television, radio, newspapers); I do not have any knowledge of asbestos; other, please specify.

Question 7. What is your opinion of asbestos?

(you may choose one or more answers)

“a dangerous material that needs to be treated carefully”; “there is not much asbestos left in the country”; “the dangers of asbestos are over-exaggerated”; “there are no risks from asbestos”; “I have never heard of asbestos before now”; “I'm not sure”.

Question 8. Why did you undertake an asbestos survey in your building?

(you may choose one or more answers)

it's the law; out of responsibility for my employees' health; undertaking refurbishment/demolition work and the contractors would not start works without an asbestos survey report; I have been made aware of the risks of asbestos and am now curious about my own building; other, please specify.

Question 9. Have those of your employees who may be likely to disturb asbestos containing materials (e.g. maintenance/repair workers) completed asbestos safety awareness training?

Yes, No