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## **Competencies of occupational physicians**

### **The customer's perspective**

Prepared by **The University of Glasgow**  
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# **RESEARCH REPORT 247**

# eeef

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## Competencies of occupational physicians

### The customer's perspective

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Occupational physicians can contribute to good management in healthy enterprises. The requirement to take into account the needs of the customers when planning occupational health services is well established. The main objective of this study was to establish the priorities of UK employers, employees and their representatives regarding the competencies they require from occupational physicians. This study involved a Delphi survey of employers and employees from public and private organizations of varying business sizes, and health and safety specialists as well as trade union representatives throughout the UK. It was conducted in two rounds by a combination of computer assisted telephone interview (CATI) and postal survey techniques, using a questionnaire based on the list of competencies employed by UK and European medical training bodies. A series of focus groups were also organized. There was broad consensus about the required competencies of occupational physicians among the respondent subgroups. All the competencies in which occupational physicians are trained were considered important but the customer priorities were different from those of the physicians. The competencies in the order of importance (most to least) were: Law and Ethics, Occupational Hazards, Disability and Fitness for Work, Communication, Environmental Exposures, Research Methods, Health Promotion and Management.

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# 1 FOREWORD

Good management of the health of workpeople and workplaces requires the advice of competent occupational health professionals. For physicians, such training in occupational medicine should start with tuition at undergraduate level but various surveys have shown this aspect of their training to be either inadequate or non-existent. Therefore general practitioners and hospital doctors are ill equipped to deal with work related health issues seen in their patients.

For those who decide to train as occupational physicians, there is a need to ensure that the educational content of postgraduate teaching reflects the knowledge, skills and competencies needed to create a cadre of highly skilled doctors to aid good management in healthy enterprises for the 21st century. Although the professional bodies responsible for training here and in other European countries have drawn up lists of competencies for occupational physicians, the views of employers and employees on these competencies had not previously been canvassed. The results of the present study are an important contribution to that knowledge base and the findings need to be incorporated into future training programmes for occupational physicians.

The occupational physician is only one of the large multidisciplinary team required to provide advice and support. This study also confirms the low level of access to occupational health and safety support services particularly for smaller organizations. Expanding this provision as envisaged by Securing Health Together will require new approaches to the delivery of the wide range of competencies which workplaces and workpeople need.

**Prof. J. Malcolm Harrington**

## 2 EXECUTIVE SUMMARY

### Introduction

1. Occupational medicine can contribute significantly to good management in healthy enterprises. The occupational physician's role is to protect and promote the health and working ability of workers. If physicians are to make a maximum contribution to employees' working ability and health and safety at work, they need to have the appropriate skills. In particular, employers must be confident that their skills are such that the cost of employing occupational physicians will be recovered through a healthier workforce.

2. The curriculum for the training of occupational physicians, which includes a list of competencies, was developed in the UK and elsewhere by occupational medicine training bodies and is long established. This research surveyed UK employers, employee representatives and health and safety specialists to establish what they thought occupational physicians' training should cover. The objectives of the study were to:

- Establish the priorities of UK employer and employee representatives regarding the competencies they require from occupational physicians
- Explore the reasons for variations of the priorities in different groups.
- Explore the views of employers and employees on health and work, and the level of occupational medical support required.
- Make recommendations for occupational medicine training curricula in consideration of these findings.

### Methods

3. A sample of private companies and public sector organizations drawn from business directories and public sector databases were surveyed. As the study was partly funded by the EEF - The Manufacturers' Organisation (EEF), companies from the EEF database were also approached. The questions assessed the importance attributed by employers and employees to eight areas of competency contained within the occupational physicians training programme. Companies approached were asked to nominate an appropriate individual to represent the employer. This was usually the director of human resources, or a member of the senior management. Employers were also asked to nominate an employee or a health and safety specialist to participate in the study. In addition, trade union workplace safety representatives and health and safety specialists were approached to take part in the survey.

4. A questionnaire was developed with reference to the curriculum currently used by the UK Faculty of Occupational Medicine. It was carefully drafted to minimise technical or medical language and administered by Computer Assisted Telephone Interviews (CATI). The results of the first round study were used to design the questionnaire for the second round of the Delphi study. In the second round of the study, respondents were asked to rank occupational physicians' competencies in the order of most important to least important. Following analysis of the questionnaire survey, 6 focus group sessions were conducted to further explore issues surrounding the topic.

## **Findings**

5. This study succeeded in establishing the priorities amongst employers and employee representatives of the competencies required of occupational physicians. All the established competency areas of occupational physicians were regarded as important by their customers.

6. There was broad consensus about the required competencies of occupational physicians among the different subgroups of the study population.

7. In order of decreasing importance, the required competencies of occupational physicians as rated by their customers are:

- Advising on Law and Ethics
- Assessment of Occupational Hazards to Health
- Assessment of Disability and Fitness for Work
- Communication
- Assessment of Environmental Exposures to Health
- Research Methods
- Health Promotion
- Management

8. When the views of the physicians across Europe on the areas important for their training were compared to those of the UK customers, it was observed that the customers' priorities were not the same as those of the physicians.

9. When asked about access to occupational health in terms of the frequency of use of occupational physicians, the majority of small companies reported little or no access to occupational physicians while most large companies had access to an occupational physician.

10. In the focus groups, when asked about sources of advice, awareness of occupational physicians was low. Occupational health nurses were used more widely. Only a minority of companies used occupational physicians extensively. This echoed the findings of the quantitative study. The barriers to using occupational health advice include the following perceptions: bias towards the employee (by the employers), bias towards the employer (by the employees), little understanding of commercial realities and employer needs, and, for smaller employers, likely costs.

11. All participants in the focus groups saw Assessment of Disability and Fitness and Identification of Hazards as core competencies for occupational physicians. However there was divergence of opinions regarding other competencies which reflects the level of exposure to occupational physicians, the industry sector of the participant and individual job functions. Training in Law was not highly rated by focus group participants.

## **Conclusions and Recommendations**

12. Existing training programmes for occupational physicians should be regularly reviewed and where necessary, modified to ensure that the emphasis of training meets customer requirements.

13. There is poor understanding of the role of occupational physicians and there should be wider communication of the roles, responsibilities and ethical obligations of occupational physicians to their customers.

14. The low level of occupational health support to British industry has been confirmed in this study and there is a need for improved access to that support, including to occupational physicians, particularly for small and medium sized enterprises.

15. The provision and development of sector specific services such as clearly demonstrated by the EEF, should be encouraged as part of a plurality of provision.

16. There is limited understanding of the multidisciplinary nature of the services required particularly by smaller and medium sized organizations.

17. New methods to deliver the competencies which employers and employees require need to be developed, taking into account the multidisciplinary nature of occupational health and safety provision and the considerable overlap which exists in the competencies of the professionals in the team.

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### 3 INTRODUCTION

Occupational medicine contributes to good management in healthy enterprises, which is an essential element of the national public health system. Employers, employees and their representatives make a number of decisions, which can influence their quality of life, working environment, work organisation and cultures. These decisions have an impact on their own health as well as their families, neighbours and customers. Good practice in workplace health has led to the recognition of economic, social and health benefits achieved at the workplace. This can also make a significant contribution to essential governmental initiatives such as decreasing health inequality, improving social cohesion and reducing sickness absence, thus reducing the overall burden of disease. Occupational health services (OHS), including health promotion, health protection and continuous evaluation of health care needs of the working population, can help to provide the knowledge and evidence necessary for continuous improvement of workplace health management. This report analyses the opinions of employers, employees and health and safety specialists who use or may use the services of occupational physicians, regarding what competencies or skills are required by these physicians to maximize their efficiency.

It is the occupational physician's role to protect and promote the health and working ability of workers. The occupational physician plays a part in reducing the incidence of diseases and injuries, alleviating suffering, and promoting and protecting people's health throughout their lives. The occupational physician is an expert adviser, sometimes part of the enterprise's senior management team who is able to assist in planning and re-engineering the work process with regard to health and safety, legal requirements, good business and human resources practice. The prime responsibility for the health and safety of workers rests with employers.

The occupational physician may work as part of an integrated multidisciplinary occupational health and safety service, or may have access to multidisciplinary colleagues in such a way as to enable the giving of appropriate advice in related fields of health and safety. Thus the occupational physician cooperates with many professionals inside and outside medicine, within the broad disciplines of health and safety, especially with senior management, legislators and government<sup>1-5</sup>.

If physicians are to make a maximum contribution to employees' working ability and health and safety at work, there must be proper arrangements in place to ensure they are competent. Professional competence is acquired through education, training and experience. In the United Kingdom, specialists in occupational medicine uniformly undergo academic and practical on-the-job training under the auspices of university academic departments and hospital-based clinical units, and the Faculty of Occupational Medicine (FOM).

A full list of competencies which may be required of the occupational physician by the enterprise and its health and safety committee can be derived from the FOM, World Health Organisation and International Labour Office conventions, recommendations and resolutions, European Union (EU) directives, the International Commission on Occupational Health (ICOH) and recommendations of the 1997 Glasgow Conference on Core Competencies<sup>1, 6-9</sup>. The 1997 Glasgow Conference on Core Competencies<sup>9</sup> identified a number of areas of specific occupational medical knowledge an occupational physician should have and these are summarized under 8 headings as described in section 5.2.

The needs of the customer group have not been formally evaluated in defining competencies of occupational physicians. The requirement to take into account the needs of the customer when planning occupational health services is well established<sup>10-13</sup> but this has not been systematically identified in the production of defined competencies of occupational physicians. The arguments in favour of involving the customer groups in the establishment of occupational physicians core competencies are similar to those brought forward by Harrington regarding research in occupational medicine<sup>14</sup>. Public and private organisations need specific skills from the occupational physicians paid to look after the health of the workforce. However it is still largely academics who define the skills of the occupational physicians who will be employed by industry.

## **4 OBJECTIVES**

The aim of this project was to conduct a needs assessment amongst UK employers, employee representatives and health and safety advisors. The study was designed to:

- Establish the priorities of UK employer and employee representatives regarding the competencies they require from occupational physicians.
- Explore the reasons for variations of the priorities in different groups.
- Explore the views of employers and employees on health and work, and the level of occupational medical support required.
- Make recommendations for occupational medicine training curricula in consideration of these findings.

## **5 METHODOLOGY**

The survey took the form of a Delphi study, which was conducted mainly by Computer Assisted Telephone Interviewing (CATI). The Delphi technique has been successfully used in groups responding for health services research<sup>14</sup> and to collate the opinion of occupational physicians in the past.<sup>15-19</sup> A series of focus group sessions were also conducted with groups of employer representatives, employee representatives or health and safety specialists, to explore the reasons for variations in the priorities in different groups.

### **5.1 SAMPLING**

In total, 1000 private companies were ordered from the Dun and Bradstreet (DNB) database and 655 companies from the EEF -The Manufacturer's Organization database. The sample was stratified by company size (number of employees); (small: 0-50 employees, medium: 51-250 employees and large: above 250 employees) and by geographical area (England, Scotland, Wales and Northern Ireland). Proportional sampling was used to recruit companies within size and geographical subgroups. A list of 174 public sector companies were recruited from the directories of Health, Police, Fire and Local Authorities throughout the UK.

For the sampling of employees, employers were requested to nominate employees for the study and also, a list of 800 health and safety representatives from the Trade Union Congress (TUC) database were approached by a postal questionnaire via the TUC. These representatives were employees in various organizations who had basic training in health and safety procedures through the TUC and therefore acted as the company fire and safety or health and safety officers or 'reps'. A list of 108 trade unions in the UK was approached to recruit health and safety specialists working with the trade unions.

The same sample was used to survey respondents for Round 1 and Round 2

## 5.2 DELPHI SURVEY QUESTIONNAIRE DESIGN

The questionnaires used in this study aimed at prioritising the key competencies required by occupational physicians. They were prepared with reference to the curricula currently used by the UK Faculty of Occupational Medicine training regulations which describes eight basic competencies<sup>20</sup>. The questionnaires were developed from those used previously by this research group in the survey of occupational physicians across Europe<sup>18</sup>. The questionnaires were redrafted using appropriate language for completion by lay respondents and were piloted internally and with a sample of 20 businesses and redrafted based on the feedback obtained from the pilot. The main topic areas were categories according to the headings suggested by the 1997 Glasgow Conference on Core Competencies<sup>9</sup> as described above. However for ease of analysis the categories were recoded as follows:

HAZARDS	Identification and assessment of occupational hazards to health
FITNESS	Assessment of disability and fitness for work
COMMUNICATION	Communication
EXPOSURES	Advising on impact of environmental exposures
PROMOTION	Promotion of general health in the workplace
RESEARCH	Using research methods
MANAGEMENT	Management
LAW	Advising on occupational health law and ethics

In the first round of the Delphi study respondents were asked if any of the above or additional training areas were important to them. If so, they were asked to score the level of importance specific competencies occupational physicians are expected to have within these topic areas on a Likert scale. Scores were from 1 (least important) to 5 (absolutely necessary). Respondents were also asked about any additional competencies they believed were important for the training of occupational physicians.

The three highest rating competencies within each training area and any major themes raised in the first round responses were used to draft the questionnaire for the second round of the study. Respondents were asked to rank three competencies within each training category in order of highest importance (1) to lowest importance (3). Examples of the questionnaires used in round 1 and round 2 are described in appendices 1 and 2 respectively.

## 5.3 INTERVIEWING

The survey was carried out by computer assisted telephone interviewing (CATI) as the pilot study proved postal questionnaire survey to be inefficient in contacting this population. CATI was contracted to SALUS Occupational Health and Safety of Lanarkshire NHS. SALUS was also responsible for the recruitment of telephone interviewers and their training, in close collaboration with Glasgow University. Participants who were unable to answer the questionnaire by telephone were given the option to complete a postal questionnaire. An initial piloting of the CATI established that most potential respondents had low awareness of the role, responsibilities and competencies of occupational physicians. Within the introduction to the study,

interviewers gave a brief standardized description of the role of the occupational physician and how they may be relevant to business.

## **5.4 DELPHI SURVEY DATA ANALYSIS**

All data entered via the CATI software Ci3 v2.5 (Sawtooth Software Inc., USA) was transferred to a statistical software package, Statistical Package for Social Scientists (SPSS V10; SPSS Inc., USA). SPSS was used to quantitatively analyse the data collected and qualitative data analysis was performed by hand looking at emerging themes in the responses. A one-way ANOVA test was used to indicate whether there were any significant differences in the mean scores between the groups studied. A further analysis using the Bonferroni pair wise multiple comparisons helped to determine which means differed. To study the significance level in the order of ranking for the competencies in round 2, a Wilcoxon signed ranks test was used. The mean differences were considered significant at the 0.05 level.

The respondents' views were further analysed by:

- 1. Size of Business**
- 2. Region of Business**
  - England
  - Wales
  - Scotland
  - Northern Ireland
- 3. Business Sector**
  - **Public Sector Companies**
    - NHS
    - Police
    - Fire Brigade
    - Local Authorities
    - Other governmental organisations
  - **Private Sector Companies**
    - Companies from the Dun and Bradstreet database
    - Companies from the EEF database
    - Other private companies
  - **Trade Unions**
- 4. Industry Category:**

Companies were classified using the Standard Industrial Classification Codes (1992), then grouped into the following representative groups:

  - Manufacturing
  - Engineering and Construction
  - Trade, hotels and transport
  - Other
- 5. Representative Groups:**
  1. Employer representatives
  2. Employee representatives
  3. Health and Safety (H&S) Specialists
  4. Trade Union Officials

## 5.5 FOCUS GROUP STUDY

A pilot focus group was run with a group of 3 health and safety specialists from trade unions in Scotland. This was organized in parallel with the Scottish Trade Union Congress (STUC) meeting in Perth, Scotland. The key issues dealing with the training of occupational physicians were discussed and the views of the participants were used as a guide to prepare the discussion guide for the focus groups in the study. A series of focus groups were organized throughout the UK and run through a contractor (The Research Business International, TRBI, London). These helped to further qualitatively explore the views of the research participants on the issues raised in the Delphi study. In all, 6 sessions lasting 90 minutes each were conducted with groups consisting of :

- Employee representatives (Group1)
- Employer representatives
  - Medium large private (Group 2)
  - Medium large public (Group 3)
  - Small private (Group 4)
- EEF (mix of sizes) (Group 5)
- Health and Safety specialists (Group 6)

Fieldwork was conducted in Birmingham and London, as these areas were within commutable distances for the participants.

Participants were recruited from the same sources as mentioned above. A recruitment questionnaire was used to screen the participants. The sample was of mixed gender, of participants aged between 25 and 55 and people employed full time. Most participants had some knowledge of health and safety at work although not all had had experience of using an occupational physician before. Participants were given a £40 participation incentive. A discussion guide was prepared by Glasgow University for use in the focus groups (Appendix 3). The interviews were taped, transcribed and analysed manually. TRBI presented the results of the study to the research team in a power point presentation and anonymised data was made available to the university.



## 6 RESULTS

### 6.1 RESPONSE RATES

#### 6.1.1 Round 1 Delphi

In total 2032 employers, employees and health and safety specialists were approached for an interview by CATI but telephone or address problems were encountered in 89 cases and therefore these were excluded from the study analysis. The total sample size was therefore 1943. Of these companies or individuals approached, 249(13%) refused to participate in the study. Reasons for refusal to participate included 'not relevant for company' and 'surveys are against company policy'. Of the remaining 1694 potential contributors, 761 agreed to participate in the study making the participation rate 45%. Of these, 13 did not complete the questionnaire either because of time constraints or due to the difficulty of the subject area, making the total number of completed interviews 748. 60% (452) of these interviews were successfully conducted by CATI. Individuals unable to participate in the CATI interview were sent an optional postal questionnaire. In total, questionnaires were posted to approximately 1200 participants but only 299 questionnaires were returned (25%) of which 3 were incomplete.

When the responses were analysed, it was noticed that four occupational physicians also completed the questionnaires. They were from larger private organizations or from the NHS. Although in the questionnaire they were asked to answer the questionnaire as an employer or employee representative, their responses were excluded from the study analysis, as their views may be a potential source of bias in the study. Therefore in total 744 responses were analysed in the first round. The break down of the respondents is shown in Figure 1.

The responses were broken down by size of business, region, business sector, industry category and representative groups as described above. Overall it was observed that there was an approximately equal distribution in numbers of small, medium or large private or public companies participating in the study (Table 1). When respondents were analysed by region within the UK, it was seen that the majority of companies were from England and therefore data analysis by region was not statistically feasible. When businesses were classified by industry sector code, companies whose business details contained only 'Engineering' and could not be classified clearly using the SIC codes were grouped under 'engineering companies'. Other companies where business profile was incomplete or missing were classified as 'unclassified'. As there was a large variance in the number of companies within each of the SIC categories, the companies were further regrouped into 5 categories: Manufacturing, Engineering and Construction, Trade, Public Services and 'Others'. Table 2 summarizes the company breakdowns for each of the business groups.

Of the 836 private companies approached using the Dun and Bradstreet database, only 133 companies responded (16%). However, from the EEF database, 630 companies were approached and 277 companies completed a questionnaire, making the response rate for this group 44%. When categorised by size (Table 3), small companies had the lowest response rates for both the EEF and Dun and Bradstreet databases with the lowest response rate of 14% observed from small companies from the DNB database. These companies belonged mainly to the Trade Sector (SIC category). From both EEF and DNB databases the majority of respondents were employer representatives. Only 59 employees nominated by the business employer representatives from companies from both the DNB and EEF databases participated in the study. Only 5 employees from the Public Sector databases participated in the study.

In total 176 responses (24%) were obtained from public sector. These included 109 (63%) responses of the 174 companies who were approached by the research team from a database of public sector companies and 63 employee representatives who were approached via the TUC. The break down of response rates for the participants approached from the public sector database is described in Table 4.

In total 341 employers from the private companies (EEF and DNB databases) and public companies (Health, Fire, Police and Local Authorities) participated in the study. The number of employees participating in the study was 259 and 185 (71%) of these were employees who responded to the questionnaire from the TUC database. The majority of these employees also provided information on their employer company. Those from private companies were classified as 'other private' companies, and those from public institutions but who could not be classified in the Health, Local, Police or Fire Authorities were reclassified as 'other public companies'. 20 employees did not provide information on their employers and they were grouped under 'unclassified' for type of business.

There was only one response from the health and safety specialists working with the trade unions. However, 29 trade union branch chairpersons, or secretaries volunteered to reply to the questionnaire and these responses were counted as 'trade union officials' responses. 114 health and safety managers, safety advisers and safety engineers, occupational health nurses, all possessing some basic qualification in Occupational Health and Safety responded to the questionnaire from a number of public and private companies. Their responses were coded as 'Health and Safety Specialist' responses.

### **6.1.2 Round 2 Delphi**

For the second round, 1406 participants were approached from the same database as used in the first round excluding the participants who refused to participate or those where a correct contact number or address was not available. In the second round, 63 companies contacted previously were not contactable due to changes in telephone number or company closure and 123 companies refused to participate in the study. In total there were 652 responses giving an overall response rate of 53% (652/1220) and 67% of the questionnaires were answered by CATI. As in the first round, there were again approximately equivalent numbers of small, medium and large companies participating in the study. These were broken down into 16% EEF private companies, 49% other private companies and 25% public companies. These could also be broken down into 292 employers, 167 employees and 150 health and safety specialists and 37 trade union officials who participated in round 2.

## **6.2 PERCENTAGE USE OF OCCUPATIONAL PHYSICIANS BY SMALL, MEDIUM AND LARGE COMPANIES**

First round participants were asked about the use of occupational physician time by their company. 48% of small companies, 20% of medium sized companies and 9% of large companies indicated that they had no access to an occupational physician (Figure 2). 23% of large companies reported that they had a full time occupational physician. Medium sized companies tend to use an occupational physician 'as and when required'.

## **6.3 DELPHI ROUND 1**

### **6.3.1 Participation rate for each training category**

Respondents were asked if a particular category was considered to be important or relevant to their business. They were then asked to score the individual competencies within the category they considered important or relevant to their business. Those who did not consider a particular category important had the option of not answering the individual questions within that category and moved on to the next category.

The percentage of participants considering each category important for the training of occupational physicians is shown in Figure 3a. Although training in the areas of Promotion, Hazards, Law, Fitness and Communication were considered important by 90% or more of the respondents, the maximum number of participants was for the category of Communication where there was an almost 100% response rate. The least number of responses were for the Management category where only 423 of the 744 respondents (56%) believed this area was relevant or important for the training of occupational physicians.

When the percentage of responses for each training category was analysed by company size, company sector, company industrial sector and respondent employment category it was observed that the above trend was followed by most subgroups (Figures 3b-3f).

### **6.3.2 Reasons for considering training area irrelevant or unimportant**

Respondents who did not consider one or more of the 8 training categories important were asked to comment on the underlying reasons. The least number of comments made were in the area of Communication, while the highest number of comments made was within the area of Management where the majority of participants believed that this was a role mainly for trained managers and not occupational physicians. Furthermore, it was believed that this part of their training need not be a priority and that occupational physicians could be trained in Management as and when required during their career through continuous professional development (CPD) courses.

In areas such as Occupational Health Hazard assessment and Environmental Medicine, the assessment of risks and exposures was considered to be the role of the health and safety manager or occupational hygienist. Research Methodology was not considered important as the physicians were expected to apply Research findings rather than practice pure research as this was 'too specialized' for their work remit. Research was considered mainly the role of the research scientist. For the area of Health Promotion, although occupational physicians were expected to have an input, it was mainly considered to be the role of management or the occupational health nurse. Furthermore, Health Promotion was considered to be part of the worker's personal agenda. The reason why Occupational Health Law and Ethics was not considered to be an important area of training by some was that although physicians were expected to have some background knowledge in medical law and ethics, legal advice should be sought from legal representatives.

### 6.3.3 Mean Scores for all respondents

Respondents were asked to score the competencies within each training category considered important. The minimum score was 1 'least important' and the maximum score was 5 'of absolute necessity'. The mean rating scores for the questions within the 8 training categories were computed by SPSS. Only complete responses from participants who answered all questions within a category were used for the calculation of the mean scores for each training category. Figure 4 indicates the distribution of mean scores for each of the training categories for the completed interviews. The mean scores for all categories were higher than 3.7, and this means that all categories were rated of above 'average importance' on the Likert scale.

Overall, in the first round respondents rated training in Occupational Health Law and Ethics, Occupational Hazards to Health, Assessment of Disability and Fitness for Work, Communication, Environmental medicine, Research Methods, Health Promotion and Management as most important to least important. Although a high proportion of participants believed that training in Communication (99%) and Health Promotion (92%) were important, the overall rating order for these competencies were fourth and seventh respectively (Table 5).

#### 6.3.3.1 Results by subgroup analysis

When the mean scores were analysed by sub-grouping as described above, it was observed that although there were some variations within each subgroup, for the majority of the subgroups the order in which the mean scores for each of the categories rated did not vary significantly from the order described above for all respondents taken together. Therefore, the consensus was that training in Law, Hazards, Fitness and Communication was significantly more important than training in Promotion and Management (Figure 5). To study the way in which the mean score of individual categories varied *between* subgroups, a one-way analysis of variance (ANOVA) was used and results are described in appendix 4.

- **By Company Size**

Results showed that there were no significant differences in the level of importance given to any of the 8 categories by the small, medium or large companies; the mean scores for Law for example, did not differ significantly between small, medium and large companies etc (Figure 5a).

- **By Company sector**

There were significant differences in the mean scores between the subgroups by company sector (public companies, private companies and trade unions) for areas of Fitness, Communication and Research. In this case, a Bonferroni *post hoc* test indicated that the public companies considered training in Fitness to be significantly more important than did the private companies, however, trade unions believed that training in Research and Communication were significantly more important than did the private sector companies (Figure 5b).

- **By private company database breakdown**

We attempted to study the difference in the way in which the mean scores compared between two subgroups of private sector companies (EEF database companies and DNB database companies). It was observed that there was no significant difference in which the means of any of the 8 categories differed between the two groups (Figure 5c).

- **By Industry Sector**

The private company responses were classified by industrial sector codes as described above. An analysis of the variance of the mean scores for each training category across the 4 subgroups of Manufacturing, Engineering and Construction, Trade and Public Service companies showed that there was no significant difference in the way any of the 8 categories scored among the groups (Figure 5d).

- **By Public sector company breakdown**

Responses from the Public sector companies including employers and employees from the Health authorities, Police, Fire Authorities, Local Authorities and other governmental bodies in the country were analysed by looking at how the mean scores for the 8 training categories varied between these groups. It was observed that Police Authorities considered training in Hazards and Communication to be significantly more important than did the Local Authorities; they also rated Fitness and Communication higher than the other public companies. Fire authorities rated training in Exposures less important than did the Health or Police authorities. Health Authorities considered training in Fitness more important than did other public companies (Figure 5e).

- **By employment representative category**

Responses were analysed by the subgroups of employer representatives, employee representatives, health and safety specialists and trade unionists. Trade unionists had a tendency to rate most of the competency categories higher than the other subgroups. An analysis of variance in the way in which the various groups rated the 8 training categories showed that the employees rated training in the areas of Hazards, Exposures, Research and Promotion significantly higher than employers. Furthermore, employees rated training in Hazards and Promotion higher than the health and safety specialists. The trade union officials believed that training in Communication and Research Methods were of significantly higher importance than the employers (Figure 5f).

- **By public and private sector employers, employees and health and safety specialists**

An analysis of how the categories rated across the subgroups of employers showed that employers of the public sector considered training in areas of Fitness, Communication, and Research to be significantly more important than employers from the private industry (Figure 5g). There were no significant differences in the way in which employees from the private sector and employees from the public sector rated any of the 8 training categories (Figure 5h). Looking at the way health and safety specialists from the public and private sector rated the 8 training categories, it could be seen that training in Promotion was the only area which health and safety specialists from the Private sector scored significantly higher than the specialists from the public sector (Figure 5i).

- **For only EEF companies**

EEF companies were sub-grouped by company size and respondent employment category. It was observed that Large EEF companies rated training in Fitness higher than small EEF companies and health and safety specialists from the EEF companies rated training in areas of Fitness and Research more important than EEF employers. There

were no significant difference in the way in which employers and employees rated the categories. The same analysis for the DNB companies showed that there were no significant differences in the way any of the subgroups by company size or respondent employment category rated any of the 8 categories (Figure 7).

#### **6.3.4 Analysis of mean scores within each training category**

Table 6 indicates the mean scores for the competencies within each of the training categories scored by all 744 respondents (out of 5) in order of decreasing importance. In the area of Law, it was significantly more important for the physicians to have knowledge of the law than to evaluate compliance or advise employers and employees on their legal obligations. In the area of Hazards, the most important area of competence was in assessing health problems, liaising with other doctors and nurses and providing advice and the least important competence was assessing and advising on first aid. In the area of Fitness, it was considered more important for the physician to be well trained in assessing fitness and disability than being able to evaluate sickness absences or advise on legal issues regarding disability. In the area of Communication it was considered more important that the physicians should be trained in reading, writing and speaking clearly and in report writing than being trained in giving presentations or participating in committees. In Environmental Medicine it was most important for the doctors to be able to differentiate between work-related and environment-related diseases and interpret the difference, while assessing and advising on environmental and general hazards related to the workplace was not considered as important. In the Research category, it was considered more important for the physician to be trained to use other research scientists and communicate about investigations rather than performing pure research by searching the literature or analysing work related issues scientifically. In the area of Management, it was considered more important to train physicians to identify occupational health needs of an organization and to encourage the use of the services provided rather than leading and planning multidisciplinary teams or managing budgets.

#### **6.3.5 Analysis of respondents' comments on any additional competencies required by occupational physicians**

Respondents were asked if there were any additional competencies they would expect an occupational physician to have. No additional competencies were suggested in any of the 8 training areas studied. Respondents believed that the competencies outlined were very detailed and covered most of the aspects of occupational medicine they require. However, one of the emerging themes in the respondents' comments was the need for further training on the provision of advice on stress related issues. Comments were also made about the need for an increase in numbers of occupational physicians to improve access to them. The need for physicians to be trained in the more specialized nature of their business was also raised. It was suggested that occupational physicians should work in closer collaboration with health and safety specialists and other members of a multidisciplinary team.

## **6.4 DELPHI ROUND 2**

Responses to the second questionnaire were analysed by summing the rank orders to produce a mean score for each item within each of the 8 sections. As some sections had 3 items and some 2, the mean scores were standardised to a 1-6 scale to allow comparison of the relative importance of items in different subsections. The mean score gives a measure of opinion with the low scores indicating high priority and high scores indicating low priority. When items within a section have similar scores this indicates that they were considered of the same priority. This was confirmed by the Wilcoxon analysis (not shown).

Mean Scores of the individual competencies scored within each training category by all respondents in round 2 are summarized in Table 7 in the 'All Companies' column. For the area of communication the highest-ranking competency was in 'reading, writing and speaking clearly in English', while communicating with other health and safety professionals was ranked third. In the category of Fitness, advising on disability and fitness for the job was ranked higher than evaluating sickness absence. In the area of Law, physicians were first expected to be well-informed about the law, and codes of practice while 'evaluation of compliance with new legislation' was third on the priority list. Differences in the ranking order between a particular subgroup and the general ranking order are indicated in red in Table 7. All of the subgroups appear to agree on the ranking of the competencies within the training categories of Fitness, Exposures and Management. The highest variation appears to be in the area of Hazards.

## **6.5 QUALITATIVE STUDY**

### **6.5.1 Key issues faced by employers and sources of advice and support used to tackle these**

Initially, the focus group discussions attempted to assess the issues faced by employers and employees regarding health at work and the sources of advice and support used by employers and employees to tackle these. The issues raised included health, safety and environmental issues including rehabilitation, back problems and lifting heavy objects, occupational asthma, allergies, environmental exposures and accidents as well as other non medical issues such as personal ones (including employee stress, bullying, alcoholism and gambling) and legislation issues (Disability discrimination, working time directive, ISO 1800 and EU directives). Employers were concerned by the ignorance of the workforce and the lack of co-operation to comply with health and safety issues. They are also overburdened by legislation and therefore vulnerable to the claims culture. Stress was another concern for the employers as this area is not well defined but is increasingly being associated with absenteeism. Although large employers mentioned that they tend to have a 'paternalistic approach' in solving the problem, smaller employers were less tolerant. They tend to use short-term tactical strategies including increase in hourly pay rate or made use of agency staff. "It's amazing what an extra big pay packet will do to relieve stress, anxiety and all sorts of things." (Smaller private employer)

Advice was sought from broad range of sources. The governmental sources in particular the health and safety executive websites; liaison officers and publications were considered most useful and reliable. However, the conflict in the role of the HSE as an advisor and an enforcer were raised as a matter of considerable concern. Employers also accessed independent sources such as the Croner website, legal helplines and the Barbour

index. The Croner website was found very useful as it covered a wide range of subjects and was regularly updated. The EEF member companies found the EEF information very useful, and 'value for money'. The information they received was specific for their industry and covered law as well as health. Employers also mentioned that they contacted health and safety professionals including occupational physicians and also used their peers and personal contacts such as trade union reps to address certain issues. The consensus was that that for a source of advice to be useful it should:

- Be knowledgeable of the industry, needs, circumstances (e.g. as a small business)
- Have a fast response
- Be well-informed in health and safety
- Be up to date on latest developments and policy
- Have access to good network of contacts
- Be able to suggest likely timescales to resolve issues
- Have credible both inside and outside the company
- Have an objective stance
- Be easy to understand
- Be '*for*' the business

Currently it is perceived that there are few bodies covering all these needs, especially in relation to small businesses. The extent to which occupational physicians meet these criteria was not investigated.

When asked about the ways in which health and safety issues were dealt with at work, employers said that they tried to communicate with their employees on health and safety policies using posters and through line managers. Large companies used the intranet and monthly bulletins largely to raise awareness. They also used medical monitoring such as health checks. Training of staff on safe handling and stress management workstations were also mentioned. Employers indicated that they use a range of support initiatives for staff members including provision of protective equipment, psychological and emotional support, staff meetings, flexible working hours etc. Employers indicated that they use a wide range of proactive strategies aside their obligatory risk assessments as dictated by necessity and depending on the type of industry or workforce. Although employers acknowledge that the legal responsibility of health and safety for the workforce rests with the employer, they believed that beyond this, the burden should be shared by the employees. It was believed that the employer should provide sensible guidance, communicate health and safety information, conduct training/ educate, carry out risk assessments and supply adequate supervision. As for the employees, they should use common sense, follow guidelines, act responsibly and take ownership. Some employers were interested in making employees more accountable for their actions. A few quotes from the sessions are as follows:

–“You can have so many things in place but if employees don't act responsibly or they're not meeting you half way then its not easy.” (Medium-large public sector employer);

–“An employer must not only protect themselves but also protect their employees and my first port of call is going to be going in there tomorrow and saying 'John, what's our position?'” (Smaller private employer)



### **6.5.2 Motivations / barriers associated with using occupational health professionals**

“[Occupational Health Professionals] Even though they were in private practice, when they put an occupational health hat on they became slightly less employer-friendly so you would have restrictions on information flow and they were always cautious with advice.” (Medium-large private employer)

[Occupational Health Services] We completed an assessment .... we sent the person and the risk assessment off to the Occupational Health Services and the information we got back was just a reiteration of what we had given them in the first place. We get many of those, it's really frustrating.” (Health and safety specialist)

The focus group employers believed that they would be motivated to use occupational health professionals because prevention was better than cure, they would be able to obtain the best advice on (personal) health, they would be able to minimise risk to staff, they would be able to assess fitness for work and recognise hazards in work place. This would make staff feel valued.

The most used occupational health professionals by the focus groups participants tended to be occupational health nurses, occupational physicians and local general practitioners (GPs), while the least used professionals were health promotion specialists and occupational hygienists (Figure 7).

Employers and employees were most familiar with the role of the occupational health nurse in the company. They were perceived to have a more caring than diagnostic role. They were there for comfort and sympathy but they were also considered competent to deal with health screening and well being as well as administering treatment for injuries. They were considered approachable and accessible. They were also considered cheaper than the occupational physicians. However, nurses were not always considered to be familiar with employer needs. They were perceived to have a lower status and therefore there was scope to undermine their value. Employers and employees believed that there was some overlap between the roles of the occupational physician and the occupational health nurse and there was a need to differentiate between them more clearly. Employers recognised the needs for an occupational psychologist who are considered to have mainly a reactive role helping with stress and trauma, which are increasingly becoming a burden for employers. They are also considered to have a proactive role in human resources and stress management. They are considered to be a potential ally by employers, but their role is often confused with that of a counselor. Many employers and employees struggled to understand the role of the occupational hygienist. The EEF employers were more familiar with their capacity. They were considered helpful in assisting with environment exposures policies and limiting exposure to risks. Health promotion specialists were considered to have an advisory rather than diagnostic role. They were considered to be useful by the employer for promoting a caring employer image. They were perceived to be a luxury rather than a necessity. Most employers and employees were familiar with the role of the physiotherapists. They were considered to be most helpful in rehabilitation, but were also perceived to have more proactive functions for example in addressing ergonomic issues. They were considered to be expensive and employers were concerned about how ‘employer-friendly’ they might be.

Occupational physicians were regarded as being a medical monitor and information provider. Although few of the participants were prepared to cite the benefits of using an occupational physician, the majority agreed that he or she would be a real asset to the company but they were considered to be very expensive. Employers, employees and health and safety specialists from the pilot focus groups were concerned about the conflict

of interest between the advice they produce and the legal requirements. They could not decide on 'whose side' the physician was and some employees preferred to use their own general practitioner. Both employers and employees believed that there was a lack in understanding of the consequences of the actions advised. Because of the (perceived) lack of impartiality the opportunity for staff to present their real problems was often seen to be limited. In this context, there was seen to be a risk that employees would not be willing to expose the extent of their illness for fear of losing their job at worst. Associated with this was the issue of the kind of relationship employees would have with an occupational physician, in comparison with the relationship with their GP. Whereas a GP was regarded as their 'friend' and has a knowledge of their personal and medical history, an occupational physician does not project that image of approachability and understanding, and therefore employees tend to distance themselves from an occupational physician. According to the health and safety specialists, ideally, occupational physicians should be trade union affiliated or independently funded by the Health Service, which would afford the degree of impartiality required. One of the comments made was:

"You're more inclined to be honest with a private physician than one employed by your company"

All respondents complained about the lack of communication between the physician and management or employees. The main area where they were seen to be lacking was in their reporting skills. Occupational physicians were often considered to be inconclusive in their findings. A report might 'be too short, too long or too technical to be of help in decision making about an employee's needs', and this lack of 'end result' was considered to lead to an under-valuing of the occupational physician's role. According to the trade union health and safety specialists, as well as improved reporting methods, clear communication was also required during assessment and advice procedures when dealing with both employers and staff. At a broader level, better performance in this area would help to literally open the channels of communication, which in turn would improve the occupational physician's image of approachability and impartiality. Some of the comments made by the different groups are as follows:

→ "They seem to be on a different planet in terms of what occupational health is all about." (EEF employer)

→ "They need to be proactive rather than just fire-fighting." (EEF employer)

→ "They need to be prepared to get off the fence and be an objective professional in the context of the environment they are working in." (Medium-large private employer)

The barriers to using occupational health professionals as perceived by employers, employees and health and safety specialists appear to be their inability to understand business implications, a shortage of occupational health professionals, a lack of information and solutions provision, a conflict of interest, little perception of added value, low recognition of local issues, and particularly for small businesses- the perceived expense.

### **6.5.3 Understanding and prioritising competencies of occupational physicians**

The focus group participants were provided with the list of competencies occupational physicians are expected to have at the end of their training. They were asked to attempt to prioritise these competencies. The consensus view for this group of participants was that the more important areas of training for occupational physicians were in Assessment of Disability and Fitness for Work and Identification and Assessment of Hazards. Although the other areas of training including Health Promotion, Environmental Medicine, Communication, Research Methodology, Law and Ethics, and Management

were all considered important, there was a more varied opinion on the importance of these areas depending on the groups questioned. The details of the prioritisation by focus group is shown in Table 8.

### **Fitness**

Training in the assessment of disability and fitness for work was considered fundamental to the physician's skill set. It was believed that physicians would require good training to be able to advise people on return to work, to establish the parameters of work an employee can perform, to identify the effect on other employers and also to advise on long-term disability and discrimination legislation. The employers however believed that when it concerns assessment of disability and fitness for work, the occupational physicians are not always objective, they tend to be vague regarding the employee's condition and they can try to hide behind oath and ethics.

### **Hazards**

Identification and Assessment of Occupational Hazards was also considered to be key component in the training of occupational physicians by all groups except small business employers. The latter perceived this role to be primarily that of a health and safety manager. The groups generally believed that physicians need to be familiar with hazards and their effects so that they can detect patterns of illness. It was hoped that physicians would play a preventative role in this field. However, it was acknowledged by the participants that few of them had had experience of occupational physicians doing this. Physicians were seen to have a more reactive role. It was also observed that the advice given by the physicians was sometimes not sufficiently tailored to the business environment.

### **Promotion**

Health Promotion in the workplace was considered to be one of the most important areas of occupational physician training by the employees, public sector employers and the EEF. Health and safety specialists and public sector employers perceive this as in keeping with the occupational health nurse role or health promotion specialist role. Small businesses regard this area as a matter of individual responsibility with only gentle encouragement from the company being required.

### **Exposures**

Training of occupational physicians in Advising on Impact of Environmental Exposures was not considered essential by most groups. It was considered more a role for service managers and health and safety specialists. None of the participants have experience using an occupational physician for environmental exposure advice. However, the employees and the EEF employers participating in the study thought training in this area was as important as identifying and assessing hazards. They believed that there was a lack of expertise in this area within the companies and therefore expert advice could be sought from an outside source such as the physicians.

## **Communication**

Health and Safety specialists and small businesses as well as public sector employees considered Communication skills to be one of the most essential skills to have by physicians. Training in this area is needed for 'clarity and jargon free' expression, and also to be able to express advice with a commercial framework in mind. Employees, employers from the private sector and EEF members considered training in this area less important as it was assumed that this should be part of all physicians' training (a basic competency).

## **Research**

Overall, it was not considered that training of occupational physicians in using Research Methodology was of high importance as this was a specialist area. Physicians were expected to have the basic skills in order to interpret research and make correlations. Small businesses and health and safety specialists rate this area more highly for similar reasons.

## **Law**

Advising on Occupational Health Law and Ethics was rated of medium to low importance by the participants. In this area a consultancy role was expected as legal sources were considered a cheaper alternative. Furthermore, there was a potential of conflict between advising on health and advising on law. However, fear of litigation meant that it would be beneficial to receive medico-legal advice directly from the physician involved and therefore training in this area would be important..

## **Management**

Occupational physician training in performing managerial duties was considered of low importance by all groups, as doctors were not perceived as good managers in general. There was some feeling that this skill was important but only within the confines of their own occupational health service department, not within the customer company.

## 7 DISCUSSION

This is the first time that the views of employers, employees and their representatives were sought to determine the training needs of Occupational Physicians. This is also the first time that a Delphi study was conducted using CATI.

### 7.1 FACTORS AFFECTING PARTICIPATION RATES

One of the problems faced in this study was getting businesses to participate in the study. A very poor response rate by postal questionnaire meant that businesses had to be contacted by telephone to increase response rates. Although there was up to 67% response rate by CATI (second round), this response was largely limited by the nature of the study and the length of the questionnaire.

- **The nature of the study**

A number of employers and employees responding to the questionnaire found some of the issues in the questionnaire not relevant to their business and therefore opted out of the study. 249 contacts from the first round and 123 from the second round refused to participate in the study, but these also included those who did not answer surveys as a rule, or those who were unwilling to 'waste time on surveys'. In all 16 questionnaires were only partially completed in round 1. Awareness of the purpose, role and responsibilities of occupational physicians was generally low.

Since the research concentrated on the training of occupational physicians, it was considered to be a very specialized topic and therefore, it was very difficult to identify the right employer representative to answer the questions especially in medium to large enterprises. The human resources manager was identified as the most appropriate candidate as observed by other studies<sup>13, 16, 21</sup>. However, a number of companies referred the interviewer to the occupational health and safety manager or other members responsible for health and safety..

- **The time factor/ length of questionnaire**

Small businesses, particularly those with less than 5 employees could not afford to spend time on the phone to discuss the questionnaire. Furthermore, with larger companies, after identifying the appropriate person, contacting them by telephone proved to be a very difficult experience due to their busy schedules. A number requested a postal questionnaire but the overall response rate to the postal questionnaires was only 25%.

A low response rate when contacting enterprises on occupational health issues is not uncommon<sup>12</sup>. A higher response rate can be obtained by narrowing the sample to choose only those enterprises which are closely associated with an organization collaborating with the study. Williams et al. (1994)<sup>11</sup> observed a 57% response rate using only postal survey as they targeted organizations within one geographical area where legislation was enforced by the HSE and questionnaires were expected to be returned to the Employment Medical Advisory Service. In this study, we observed a 44% response rate with EEF companies as the regional offices for the EEF supported the study and companies were requested to participate. This compared to a 16% response for other private companies recruited from the Dun and Bradstreet database. The public sector companies also collaborated well in this study. A 63% response rate was observed with this group. Reid and Malone (2003) also noted a high response rate of 79% in their survey of human

resources managers in the Irish Civil service<sup>13</sup>. Again this high response rate may also be associated with the specificity of the group they targeted.

## **7.2 METHODOLOGY**

In a classic Delphi optimally four rounds of questionnaires and feedback should be used until there is a convergence of opinion or until a point of diminishing returns is reached<sup>22,23</sup>. The weaknesses of using the Delphi technique in prioritising areas of occupational medicine have been described before<sup>15,24</sup>. One of these is that this process can often lead to a very large questionnaire. The use of CATI limited the length of the questionnaire used in the study as respondents found it difficult to respond to questionnaires more than 10 minutes long. Furthermore, in the Delphi respondents are often required to prioritise topic areas which they consider of equal importance. In this study, this was made more difficult by the fact that respondents had to assess such issues on the telephone. Respondents answering the postal version of the questionnaire may have had more time and understanding in the assessment of the competencies. Furthermore, the use of CATI in ranking made it very difficult for the respondent to rank more than 3 items at a time. Although to a certain extent, the second round of the Delphi study helped to confirm the findings of the first round, it did not identify any new concepts which could be used in further rounds. The use of CATI followed by Email collation rounds appears to be a better alternative. A recent Delphi successfully used telephone interviewing followed by 3 rounds of Email collations<sup>19</sup>. However there, the sample size was only 25 and all participants were experts closely linked to the study subject. A study looking at postal, Email and world wide web methods of conducting health surveys in the workplace showed that there was a poorer response for an Email survey alone as compared to using Email followed by a postal questionnaire<sup>25</sup>. The accuracy of Email lists and the increasing problem of unwanted or junk Emails were perceived to be limiting factors.

## **7.3 OCCUPATIONAL HEALTH ACCESS**

It is well established that small to medium enterprises do not have as much access to occupational physicians as do larger companies<sup>21,26</sup>. In this study higher levels of occupational physician access has been reported by all categories than reported by other recent surveys<sup>21,26</sup>, suggesting reporting bias. 10% of the small companies (less than 50 employees) who reported that they had access to a full time physician were companies which were part of larger multinational or international organizations.

In our focus group sessions, employers felt that they are encumbered by increasingly varied health and safety issues with significant implications for the well-being of employees and the business. These included the mounting burden of legislation and the rapidly rising 'claims culture'. The range of issues were such that they needed advice from multidisciplinary sources and ones which they felt were reliable. There were very few sources of advice that could meet the needs of all businesses as circumstances differ from business to business. In this respect, while employers were very satisfied by the quality and level of information and advice obtained from governmental bodies such as the HSE, they were also concerned about the risk of legal reprisals following an HSE involvement. The role of the HSE as the adviser and enforcer may inhibit the use small enterprises will make of the HSE other than website information sources. A recent CBI survey reported that only 22% of businesses surveyed used their enforcement authority as their first port of call for technical or health and safety advice. The most favored source of advice was from trade or industry bodies followed by in-house company consultants/specialists<sup>36</sup>. With the EEF member companies, the occupational health

advice provided by the EEF was considered 'good value for money' and members were very satisfied with the quality of the advice provided. This is probably influenced by the fact that the advice was specific to their business sector and engaging with the EEF for advice was not considered to incur a risk of legal action.

The use of occupational health professionals was discussed with the employers and employees in the focus groups. The most frequently used professional was the occupational health nurse. Occupational health physicians and local GPs came next. The role of occupational health nurses in workplace health management is detailed elsewhere<sup>27</sup>. Nurses are the largest single group of health care professionals involved in delivering healthcare in the workplace. While there is overlap between the competencies of occupational health nurses and other providers of occupational health services, no single discipline has all the competencies required by customers. Thus there is a need for the provision of multidisciplinary occupational health and safety support to work in collaboration with management and the employees. Barriers to using occupational health professionals centre on perceived bias either towards the employer or the employee, a perception of low levels of understanding of commercial realities and employer needs, and for smaller employers, the likely costs. These findings confirm the need for improved access to a multidisciplinary occupational health and safety advice in the UK and the provision of services which are seen as independent and which can provide advice which is targeted to the needs of organizations and individuals.

#### **7.4 RATING OF COMPETENCIES**

This study demonstrates that employers, employees and their representatives considered that in the training of occupational physicians, all the competencies were important. This validates the training of occupational physicians in the UK which mirrors the EU competencies<sup>9</sup>. Although there were some differences amongst the subgroups interviewed, there was generally a reasonable concurrence. Respondents' ratings from most important to least important were: Law and Ethics, Assessment of Occupational Hazards, Assessment of Disability and Fitness for Work, Communication, Environmental Exposures, Research, Health Promotion and Management.

Although the majority of the respondents believed that it was very important for physicians to be trained in Communication, the most highly rated area of competence was Law and Ethics. The most important area of training within Law and Ethics appears to be on "being well-informed about acts, regulations, codes of practice and guidance". Earlier studies of the occupational health needs among employers and employees did not consider the legal aspect of occupational health service provision and this issue was not raised by their respondents<sup>11,12</sup>. In this study, the focus group participants did not rate training in Law and Ethics as the top priority. Respondents indicated that in view of the rapidly rising 'claims culture', occupational physicians were expected to be competent in interpreting the law, however, they would primarily seek legal advice from legal representatives. For the occupational physician knowledge of the laws and regulations governing occupational and environmental health seems essential to meet the socially and politically defined legal obligations to employers, employees and society in general. There was confusion regarding whether the occupational physician represented the employer or the employee and the ethical position needs to be better understood. In the workplace occupational health physicians tend to be 'Between Medicine and Management'<sup>28</sup> and pure patient to doctor relationships can sometimes be blended with managerial issues. The importance of training of physicians to deal with such situations appears to be one area where the providers and customers of occupational medicine all seem to agree<sup>18</sup> (Table 9). The International Commission on Occupational Health (ICOH) and the Faculty of Occupational Medicine in the UK (FOM), have prepared

codes of ethics for occupational health professionals. These need to be more widely disseminated to their customers.<sup>8,29</sup>

Other highly rated areas of training were the Identification and Assessment of Occupational Hazards to Health (Hazards), Assessment of Disability and Fitness for Work (Fitness) and Communication. In a study on the comparison of perceived health care needs in 1994, Williams and co workers<sup>11</sup> observed that for all occupational physicians, employers, employees and trade union representatives, advice on the work environment and evaluating risks (Hazards) was one of the highest priority functions of an occupational health service. At that time, Fitness (resettlement and rehabilitation of the sick and injured worker) was not high on the list of priorities for any except the occupational physician suggesting that there has been a change in the priorities of customers.

Training in the areas of Health Promotion and Management had the lowest scores. One of the themes emerging from the respondents' comments were that was that the responsibility for health promotion should be shared between employers, employees as well as the occupational physician. The latter was expected to have more of an advisory role rather than that of a needs assessor or provider of health promotion activities. In the area of management, respondents rated training in the areas such as 'identification of occupational health needs', 'encouraging the use of occupational health services' and 'defining the role of an occupational health service' very highly (scoring above 4 out of 5) while training in areas such as 'negotiating and managing budget' and 'planning or leading a multidisciplinary service' were considered least important. This implies that the customers agree that the occupational physicians should be able to 'understand management principles so as to be able to inform management on the risks workers are exposed to'<sup>30</sup>. However, they do not believe that occupational physicians should be part of management and there may be a lack of understanding of the purpose of training occupational physicians in management skills. Many full time occupational physicians have responsibility for managing staff and services. However, in the occupational physician survey, management was low in their list of priorities<sup>18</sup>.

When companies were categorised by company size and industry sector, there were no significant differences in the mean scores for each competency. There was also no significant difference in the way in which private companies from the EEF or other private companies rated the competencies. However, public sector companies rated training in Fitness higher than private sector companies. This might be related to the fluidity in the job market in the private sector compared to the more permanent, or long-term contracts in the public sector with its well-established higher levels of sickness absence<sup>31-34</sup>. There may be a greater need for occupational physicians in the public sector to be involved with fitness and disability assessment and the provision of advice on rehabilitation and sickness absence reduction.

Employees rated training in areas such as Hazards, Exposures, Research, and Promotion higher than employers. Employees also rated training in areas such as Hazards and Promotion higher than health and safety specialists. Employees seem to have a more disease focused view of occupational health service provision and are very concerned about preventative methods. Their views were closer to those of occupational physicians in this respect<sup>18</sup>. Similar observations were made in a recent Irish study on the comparison of employer and employee views on occupational health care needs<sup>13</sup> where employees rated areas such as *medical screening* (included in Hazards in this study) and *occupational health and general health education* (included under Promotion in this study) as the top priority areas.



For trade unionists training in Research and Communication was more important than for private sector company representatives. Qualitative comments by trade unionists and trade union health and safety specialists reported that occupational physicians were perceived to be biased and not easily approachable. Physician reports were believed to be sometimes difficult to comprehend or interpret or 'inconclusive in their findings'. In this study, there was a relatively high participation rate in the Communication questions and the topic is regarded as of high importance. It would appear that the concerns around this area are related to the content and clarity of medical reports and advice. All participants want clarity in their answers they get from Occupational physicians, but the focus group responses suggest that there is a lack of understanding about the ethical restrictions on what the occupational physician is allowed to communicate. Similarly, the varying responsibilities of the physicians in the differing scenarios where they are called to provide advice e.g. pre employment assessment, management referral, health surveillance or self-referral, are poorly understood and a recipe for discontent with the physician's subsequent advice and communication.

This study has shown that there are differences in the priorities of occupational physicians and their customers regarding the competencies required by occupational physicians. It could be hypothesized that those respondents with little knowledge of occupational physicians might have based their responses on their experience of the medical profession in other settings e.g. General Practitioner. However, this does not appear to be the case as there was reasonable concurrence amongst all customer subgroups analysed, particularly between small and large company respondents. But, given the relatively low levels of utilisation and familiarity with occupational physicians a number of questions arise. Is there a false premise? Do the customers of occupational health really know what they need? Do occupational physicians and other occupational health and safety professionals really know what is best for their customers? The consistency of customer responses from a wide range of private and public organizations and including employers, employees and health and safety specialists suggests that they do know what they need.

## 8 CONCLUSIONS

8.1. This study has established the priorities amongst employers and employee representatives of the competencies required of occupational physicians. It has compared these with earlier studies of the priorities as determined by occupational physicians. All the established competency areas of occupational physicians were regarded as important by their potential customers. However, there are substantial differences in the rating and ranking of the relative importance of these competencies between the physicians and their customers. This has implications for the future training of occupational physicians.

8.2. There was generally reasonable concurrence amongst respondent subgroups on the relative importance given to each competency. All agreed that Law and Ethics was the highest scoring competency and Management was the least scoring competency. There were subtle significant differences on the level of importance for the other competencies between subgroups. For example employees rated training in Hazards, Exposures, Research and Promotion higher than employers and Trade Unionists rated training in Research and Communication higher than Private sector company representatives. This diversity is representative of the issues central to the subgroups.

8.3. The opinions of employers and employees have been explored by a mixture of qualitative and quantitative research. There is generally poor understanding of the role of occupational physicians and a limited understanding of the multidisciplinary services required particularly by the smaller organizations. The low level of occupational health support to British industry has been confirmed in this study. There is a need for improved access to occupational health and safety support, including to occupational physicians, particularly for small and medium sized enterprises. The sector specific advice and services such as offered by the EEF was associated with greater levels of provision, improved awareness of issues, and higher satisfaction levels within the study.

8.4. While this study has validated the competency areas of the training of occupational physicians, it points to a need for a change in the emphasis of occupational physicians' training so that it is more aligned to the needs of their customers.

8.5. The competencies in order of decreasing priority as rated by the customers of occupational physicians are:

- Advising on Law and Ethics
- Assessment of Occupational Hazards to Health
- Assessment of Disability and Fitness for Work
- Communication
- Assessment of Environmental Exposures to Health
- Research Methods
- Health Promotion
- Management

## 9 RECOMMENDATIONS

- 9.1. Development and redesign of training programmes
  - a. There should be a review of the Occupational Medicine training programmes to ensure that occupational physicians are fully competent in the areas which their customers think are important.
  - b. Given the evolution of occupational health there should be regular and systematic evaluation of teaching curricula taking into account the views of the customers.
- 9.2. The role, responsibilities and ethical obligations of occupational physicians are poorly understood and wider dissemination of these should be communicated to their customers.
- 9.3. There is a need to improve access to competent occupational health and safety services including occupational physicians, across the UK and the findings of this study support the recommendations of the Report of the Support Programme Action Group of Securing Health Together<sup>35</sup>.
- 9.4. The provision and development of services such as clearly demonstrated by the EEF, should be encouraged as part of a plurality of provision.
- 9.5. The relatively low number of occupational physicians in the UK will require the development of new methods of delivery of the competencies, which employers and employees require. These need to take into account the multidisciplinary nature of occupational health and safety provision and the considerable overlap which exists in the competencies of the professionals in the team. Further research is required in this area.

## **10 ACKNOWLEDGEMENTS**

The authors acknowledge the invaluable assistance they have received from Mr David Lewis of the HSE; Dr. Mike McKiernan, Dr. Syeed Khan and Mr Steve Walter of the EEF-The Manufacturer's Organisation; Mr Owen Tudor of the Trade Union Congress; Mr Ian Tasker of the Scottish Trade Union Congress; Ms. Kathleen Houston of SALUS Occupational Health and Safety; Ms Barbara Heffernan and Ms Anjul Sharma of The Research Business International; and Mr. Harper Gilmour (Statistician) and Mr. Keith Murray (Computer Manager) of the University of Glasgow.

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## 12 TABLES AND FIGURES

Table 1. Responses by Company Size

Size of Business	Number of Completed Interviews	Percent (%)
Small	230	31.0
Medium	239	32.2
Large	274	36.9
Total	743	100.0

Table 2. Reclassification of companies by industrial sector

Company	Industrial Category					Total
	Manufacturing	Engineering and construction	Trade	Public Service	Others	
Business	35	12	63	12	11	133
Private EEF	160	66	37	7	7	277
Private Other	39	15	26	20	7	107
Public				154	4	158
Public Other				18		18
TU Officials					30	30
Unclassified					21	21
Total	234	93	126	211	80	744

Table 3. Response rate by database set and company size

Size of companies	RESPONSE RATES	
	DNB database	EEF database
Small	N=51 (14%)	N=82(31%)
Medium	N=50 (21%)	N=97(57%)
Large	N=32 (24%)	N=98(52%)



**Table 4. Number of responses by employment representative category and company size\***

Employment category	Detailed type of business	Size of Company			Total
		Small	Medium	Large	
Employer Representatives	Private DNB	46	33	23	102
	Private EEF	61	71	54	186
	Public- Health Authority	11	5	3	19
	Public-Police	3	9	3	15
	Public - Fire Authority		1	4	5
	Public -Local Authority		2	12	14
	Total	121	121	99	341
Employee Representatives	Private DNB	1	6		7
	Private EEF	13	18	21	52
	Private Other	23	38	46	107
	Public- Health Authority	9	5	8	22
	Public-Police	3	2	3	8
	Public - Fire Authority		1	5	6
	Public -Local Authority	8	7	3	18
	Public Other	3	9	6	18
	Unclassified	6	5	9	20
	Total	66	91	101	258
Health and Safety specialists	Private DNB	4	11	9	24
	Private EEF	8	8	23	39
	Public- Health Authority	13	1		14
	Public-Police	2		1	3
	Public - Fire Authority	1	3	18	22
	Public -Local Authority	1		11	12
	Trade Unions	1			1
Total	30	23	62	115	
Trade Union officials	Trade Unions	13	4	12	29
	Total	13	4	12	29

\*Data regarding size of company for 1 employee representative response was missing. Therefore total number of employees responding to the questionnaire was 259.

**Table 5. Results of the mean scores of subject areas indicated for all participants**

<b>Training Area</b>	<b>Percentage of respondents considering training area important</b>	<b>Mean score rating by all respondents</b>	<b>Importance Rating Order</b>
<b>Communication</b>	99%	4.03	4
<b>Fitness</b>	97%	4.09	3
<b>Law</b>	92%	4.21	1
<b>Hazards</b>	92%	4.09	2
<b>Promotion</b>	92%	3.76	7
<b>Exposures</b>	81%	3.98	5
<b>Research</b>	75%	3.88	6
<b>Management</b>	57%	3.75	8

**Table 6. Mean Scores for individual competencies within each training category**

<b>TRAINING AREA</b>	<b>COMPETENCY</b>	<b>MEAN SCORES</b>	
LAW	Be well-informed about acts, regulations, codes of practice and guidance	4.36	
	Evaluate compliance with new legislation	4.17	
	Advise managers, safety representatives and employees of their legal obligations under health and safety law	4.10	
HAZARDS	Assessing health problems, liaising with other doctors and nurses and providing advice	4.41	
	Organising and monitoring programmes to check the health of people exposed to hazards at work	4.19	
	Assessing the work environment and evaluating risks	4.11	
	Providing advice and information on measures to control risks	4.10	
FITNESS	Assessing and advising on First Aid facilities	3.66	
	Assessing injury, disability and handicap in relation to work	4.46	
	Assessing fitness for the job	4.36	
	Assessing and advising on early retirement due to ill-health	4.23	
	Helping people to get back to work (rehabilitation)	4.22	
	Advising on drug and alcohol problems	3.92	
	Evaluating absence from work due to sickness	3.84	
COMMUNICATION	Advising on legal issues including the Disability Discrimination Act	3.63	
	Reading, writing and speaking clearly in English	4.63	
	Writing a report	4.51	
	Using language their audience can understand	4.49	
	Applying legal and other ethical requirements for confidentiality	4.48	
	Liaising with other professionals to organise and deliver training	3.55	
	Giving presentations to an audience using audio-visual equipment effectively	3.30	
	Working effectively as a member, secretary or chair of a committee	3.25	
	EXPOSURES	Understanding and explaining the difference between work-related and environment-related disease	4.11
		Assessing and advising on the control of environmental exposures from the workplace	4.02
Recognising and advising on hazards in the general environment		3.82	
RESEARCH	Use other professional experts when appropriate	4.34	
	Report on an investigation orally and in writing	4.26	
	Recognise and initiate the investigation of clusters of disease e.g. cancer in a work force	4.10	
	Be able to analyse and interpret data	3.91	
	Use a computer for the storage and analysis of data	3.78	
	Interpret scientific data in journals and from own research	3.74	
	Search published literature	3.71	
	Plan data collection for simple surveys	3.54	
	Convert a workplace health problem into a researchable question	3.54	
	PROMOTION	Assessing needs for health promotion	3.86
Organising, providing and evaluating work related health promotion activities		3.66	
MANAGEMENT	Identifying the occupational health needs of an organisation	4.25	
	Encouraging the use of occupational health services	4.10	
	Defining the goals and objectives of an occupational health service	4.04	
	Evaluating the quality of an occupational health service and carrying out clinical audit	3.85	
	Managing an occupational health department	3.80	
	Evaluate the service provided	3.79	
	Designing a training programme for occupational health staff	3.66	
	Organising record keeping using computers if appropriate	3.65	
	Defining the roles of occupational health staff and formulating job descriptions	3.64	
	Selecting, appointing, supervising and appraising staff performance	3.62	
	Negotiating and managing a budget	3.51	
Lead a team of multidisciplinary service providers	3.43		
Plan the efficient use of multidisciplinary resources	3.42		

**Table 7. Prioritisation of competencies of occupational physicians by all participants and by subgroups**

TRAINING AREA	COMPETENCY	MEAN SCORES											
		By company size				By representative category				By company type			
		All companies	Small	Medium	Large	Employer representative	Employee representative	Health and Safety Representative	Trade Union Representative	Private EEF	Private Other	Public	Trade Union
COMMUNICATION	Reading, writing and speaking clearly	1.78	1.65	1.82	1.81	1.71	1.83	1.91	1.73	1.80	1.81	1.75	1.73
	Applying law and ethics for confidentiality	2.10	2.14	2.05	2.06	2.08	2.20	1.99	2.19	1.98	2.10	2.14	2.21
	Communicating with other health and safety professionals	2.11	2.21	2.13	2.14	2.21	1.97	2.11	2.08	2.22	2.09	2.10	2.06
FITNESS	Advising on disability and fitness for the job (including the Disability Discrimination Act)	1.53	1.61	1.51	1.53	1.60	1.57	1.38	1.41	1.52	1.57	1.45	1.51
	Advising on rehabilitation and ill-health retirement	2.02	1.95	2.17	2.01	2.03	1.98	2.08	1.86	2.13	2.04	1.98	1.81
	Evaluating sickness absence	2.46	2.44	2.32	2.46	2.37	2.46	2.54	2.73	2.34	2.38	2.58	2.68
LAW	Being well-informed about the law, and codes of practice	1.70	1.64	1.76	1.65	1.70	1.70	1.68	1.84	1.77	1.64	1.68	1.92
	Being able to advise managers and employees about their legal obligations	1.99	2.10	1.99	2.01	2.01	1.95	1.95	2.08	1.85	2.02	1.98	2.06
	Being able to evaluate compliance with new legislation	2.31	2.27	2.25	2.34	2.30	2.35	2.36	2.08	2.38	2.33	2.34	2.02
HAZARDS	Assessing risks at work and advising on control measures	1.90	1.84	1.93	1.86	1.83	1.99	2.00	1.68	1.85	1.92	1.94	1.78
	Monitoring the health of people exposed to hazards at work	2.02	2.08	2.06	2.16	2.14	1.89	1.89	2.22	2.07	2.05	1.93	2.03
	Providing expert assessment and advice on health problems	2.08	2.08	2.01	1.97	2.03	2.13	2.11	2.11	2.09	2.03	2.12	2.19
PROMOTION	Assessing needs for health promotion	2.21	2.33	2.31	2.12	2.22	2.33	2.09	2.00	2.40	2.25	2.03	2.16
	Organizing, providing and evaluating health promotion activities	2.30	2.18	2.19	2.39	2.28	2.18	2.42	2.51	2.10	2.25	2.48	2.34
	Differentiating between work-related and environment-related health problems	1.45	1.52	1.45	1.35	1.43	1.55	1.39	1.43	1.43	1.42	1.50	1.56
EXPOSURES	Assessing and advising on the impact of environmental discharges from the workplace	1.98	1.91	1.94	1.99	1.95	1.90	2.13	1.92	1.91	2.01	2.02	1.86
	Liasing with other environmental specialists	2.57	2.57	2.61	2.66	2.62	2.54	2.47	2.65	2.66	2.57	2.48	2.59
	Investigating a workplace problem through research	1.88	1.97	1.90	1.79	1.83	1.99	1.89	1.73	1.95	1.85	1.85	1.95
RESEARCH	Investigating clusters of disease e.g. cancer in a work force	2.04	2.04	2.00	2.10	2.07	1.96	2.04	2.05	1.92	2.05	2.10	1.95
	Analysing and explaining scientific data and research reports	2.09	1.98	2.10	2.11	2.10	2.05	2.07	2.22	2.12	2.09	2.04	2.10
	Identifying the occupational health needs of an organisation	1.43	1.41	1.30	1.49	1.44	1.47	1.36	1.38	1.37	1.38	1.55	1.44
MANAGEMENT	Setting and achieving the objectives of the occupational health service	2.10	2.14	2.17	2.03	2.10	2.09	2.09	2.14	2.21	2.07	2.02	2.21
	Evaluating the quality of an occupational health service and carrying out audit	2.48	2.45	2.53	2.48	2.46	2.44	2.55	2.49	2.42	2.54	2.43	2.35

**Table 8. Prioritisation of training areas by focus group participants**

	EEF employers	Med-Large Public Employers	Med-Large Employers	Small Private Employers	H&S specialists	Employees
More Important	Hazards	Hazards	Hazards	Research	Hazards	Fitness
	Fitness	Promotion	Fitness	Fitness	Fitness	Hazards
	Promotion	Communication	Management	Communication	Research	Promotion
	Exposures	Fitness			Law Communication	Exposures
Medium Importance			Law Promotion			
Less Important	Law	Management	Research	Hazards	Exposures	Communication
	Communication	Law	Exposures	Management	Promotion	Research
	Research	Research	Communication	Promotion	Management	Law
	Management	Exposures		Exposures		Management
				Law		

**Table 9. Prioritisation of training areas by customers of occupational health (employers, employees and their representatives) and occupational physicians**

Competency	Ranking by Mean Scores	
	Customer Group	Occupational Physician Group <sup>18</sup>
Law	1	2
Fitness	2	5
Hazards	3	1
Communications	4	3
Exposures	5	8
Research	6	4
Promotion	7	7
Management	8	6

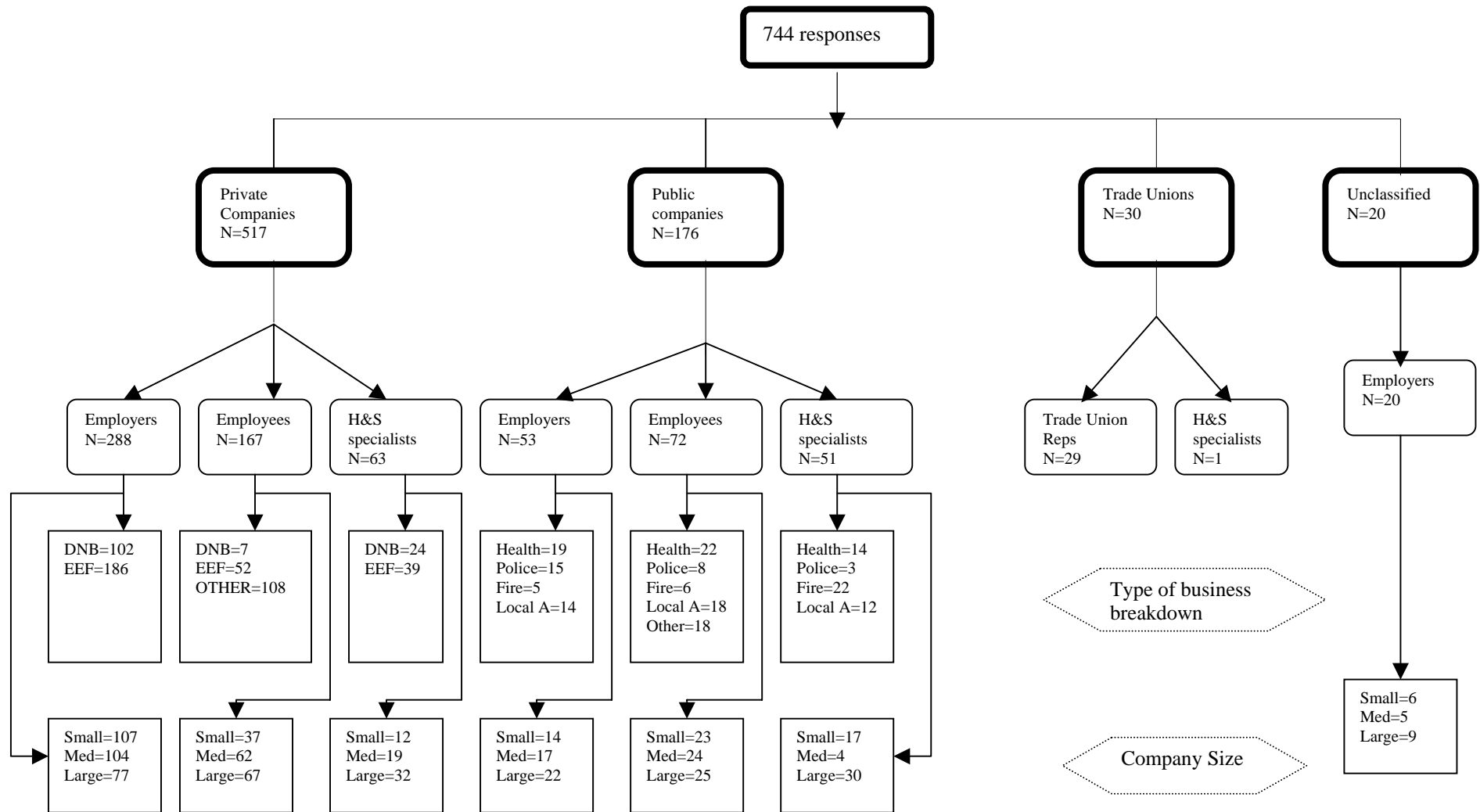


Figure 1. Breakdown of responses

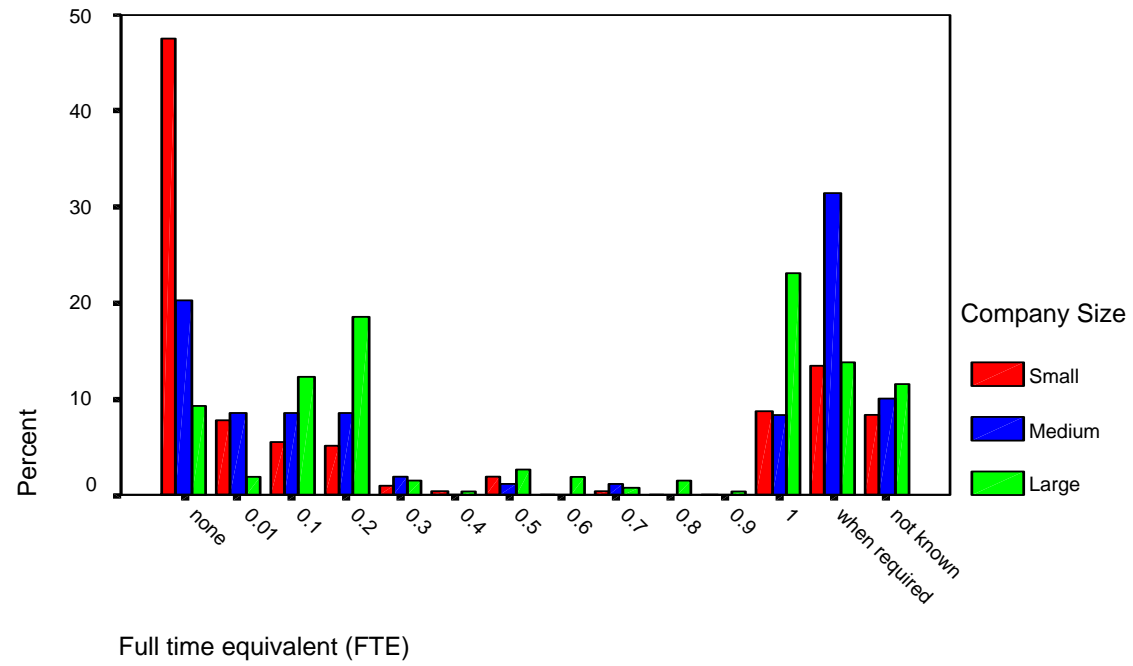


Figure 2. Percentage use of Occupational Physician time

Figure 3. Percentage of participants considering category important in Occupational Physician training

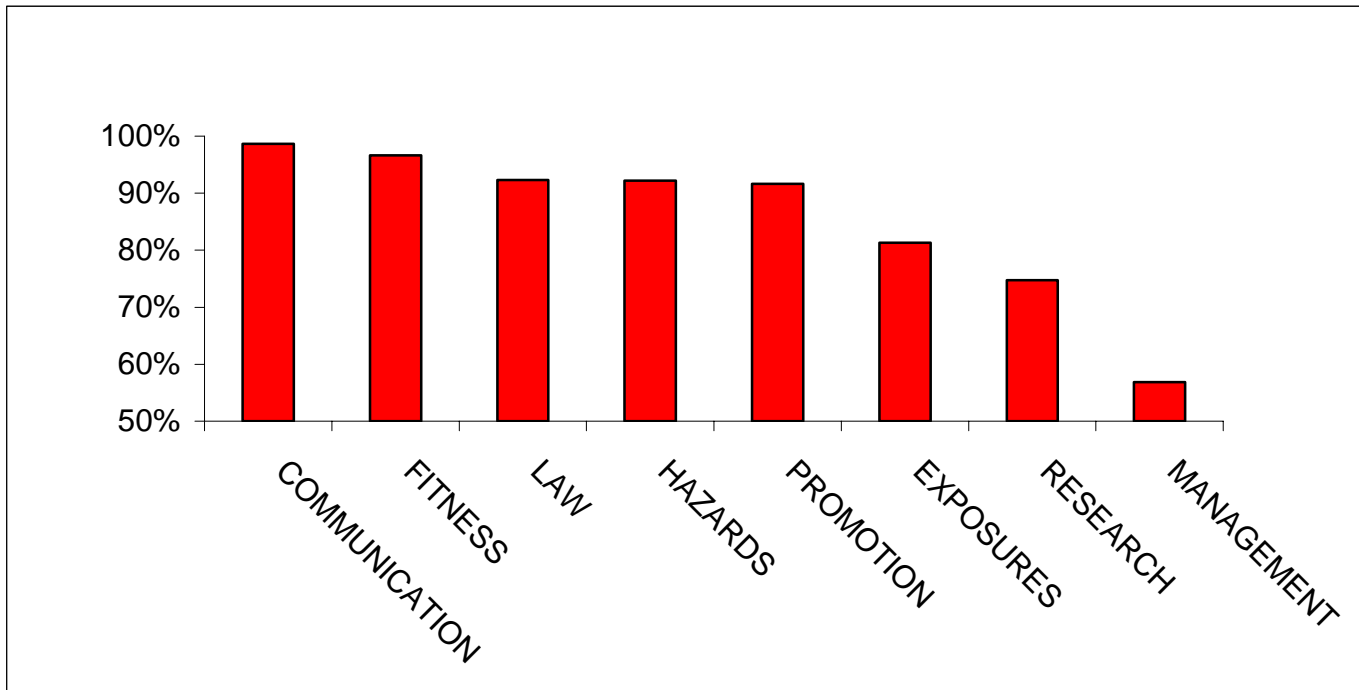


Figure 3a Percentage of participants considering category important in Occupational Physician training



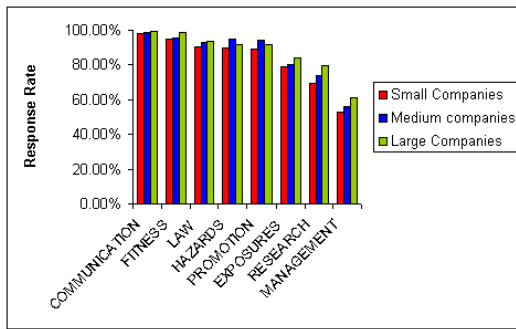


Figure 3b: By Company Size

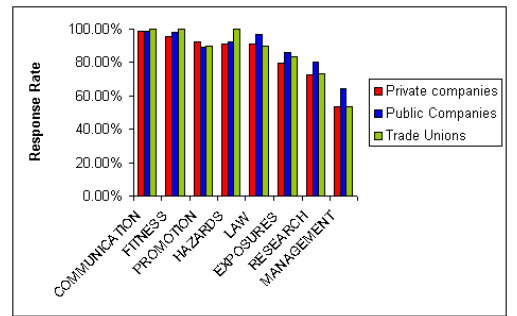


Figure 3c: By company sector

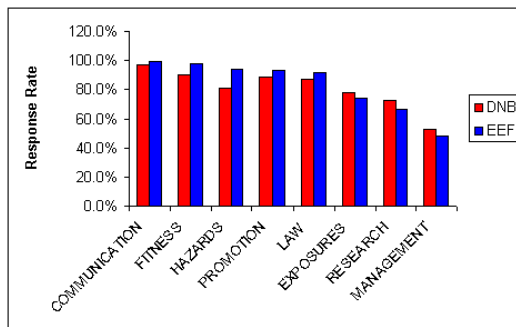


Figure 3d: By EEF and DNB databases

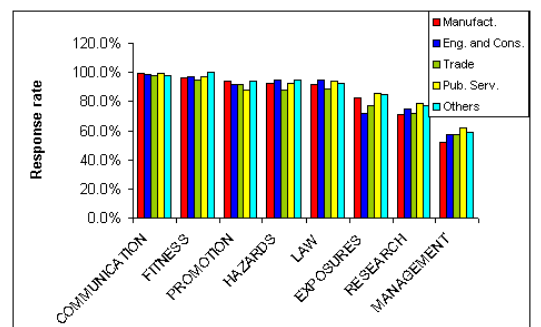


Figure 3e: By Industry codes

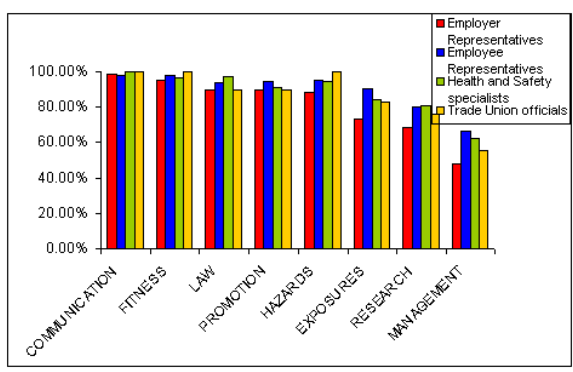


Figure 3f: By employment category

**Figures 3b-3f Percentage of participants considering category important in Occupational Physician training company size, company sector, database of private company, SIC code, and respondent employment category**

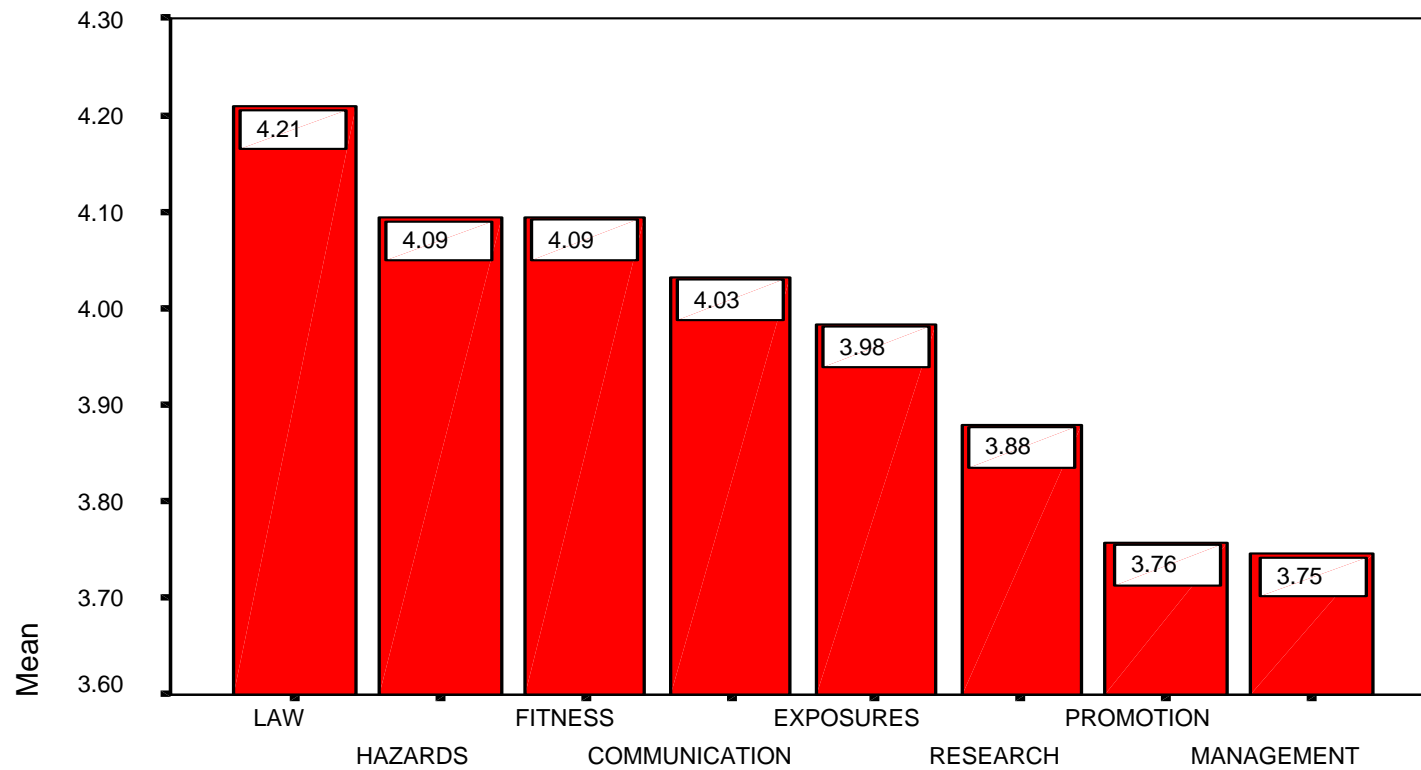


Figure 4. Mean scores for each training category for ALL respondents

Figure 5. Mean scores for each training category analysed by sub-grouping participants

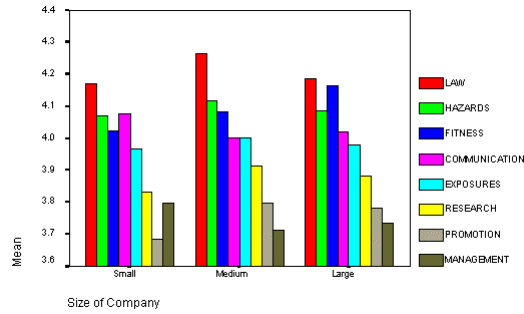


Figure 5a: Mean scores for each training category by company size

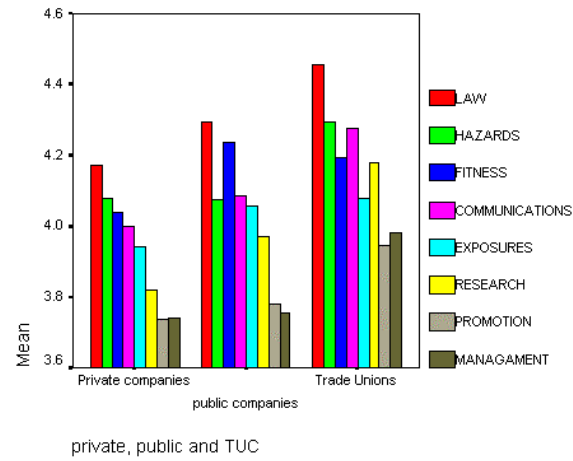


Figure 5b: Mean scores for each training category by company sector

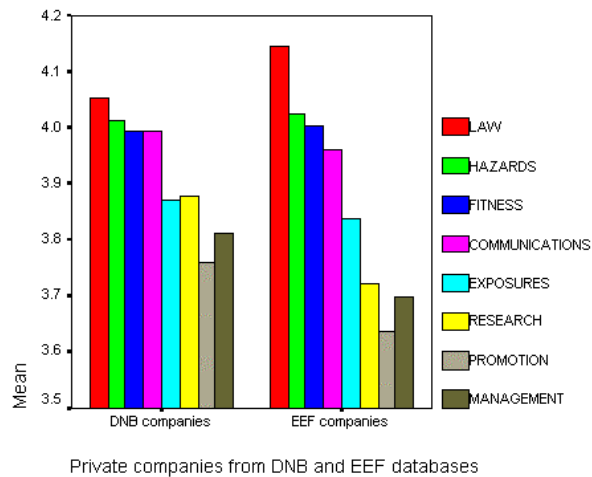
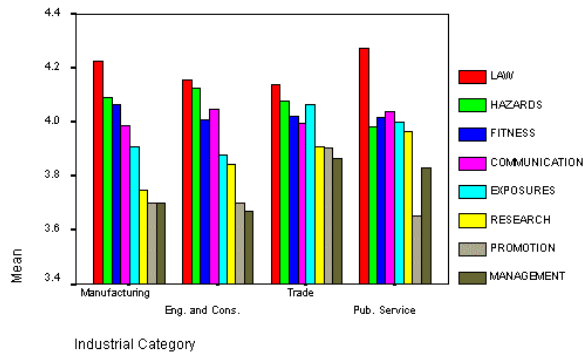
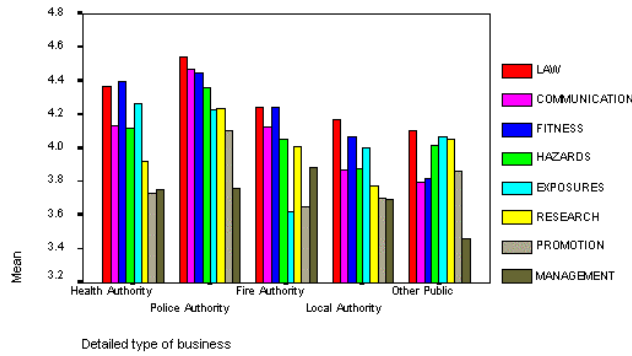


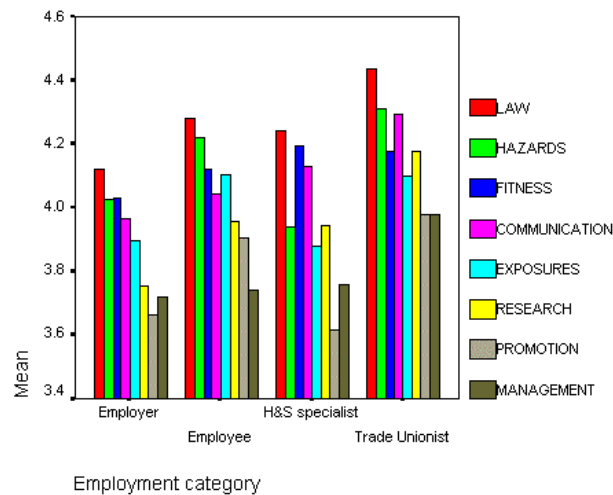
Figure 5c: Mean scores for each training category by Private company database breakdown



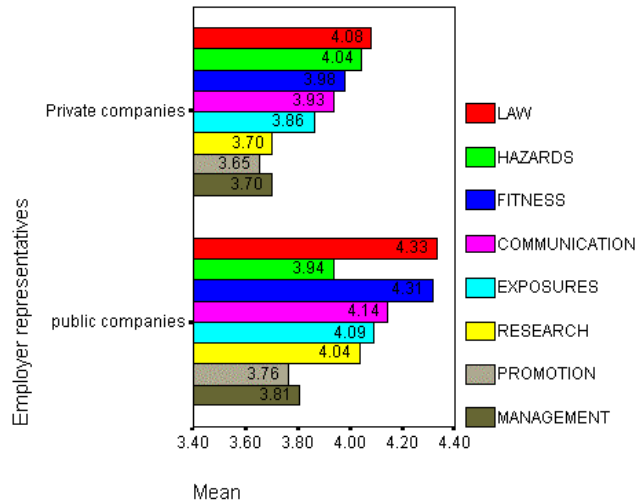
**Figure 5d: Mean scores for each training category by Industry breakdown**



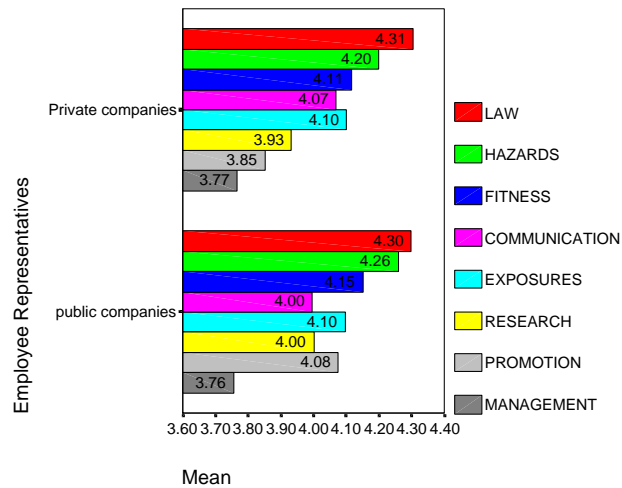
**Figure 5e: Mean scores for each training category by Public sector company breakdown**



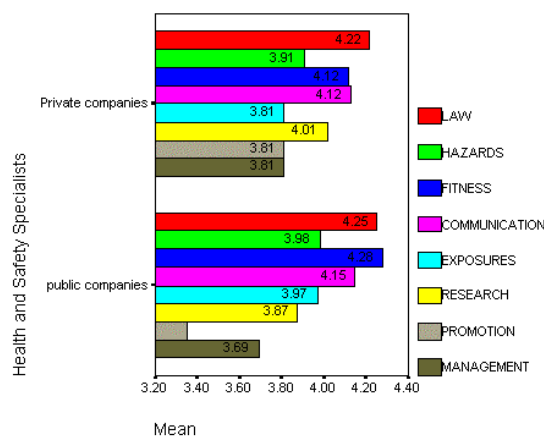
**Figure 5f: Mean scores for each training category by employment category**



**Figure 5g: Mean scores for each training category by employer representatives from the public and private sector companies**

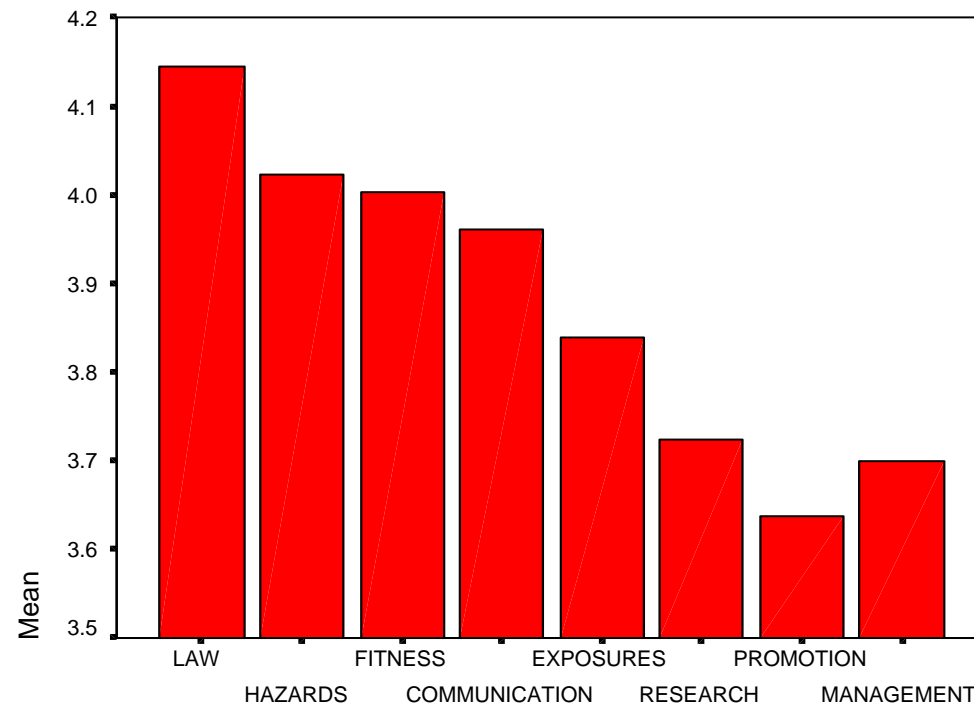


**Figure 5h: Mean scores for each training category by employee representatives from the public and private sector companies**



**Figure 5i: Mean scores for each training category by health and safety representatives from the public and private sector companies**

**Figure 6. Analysis of responses from EEF companies**



**Figure 6a: Mean Scores for EEF companies**

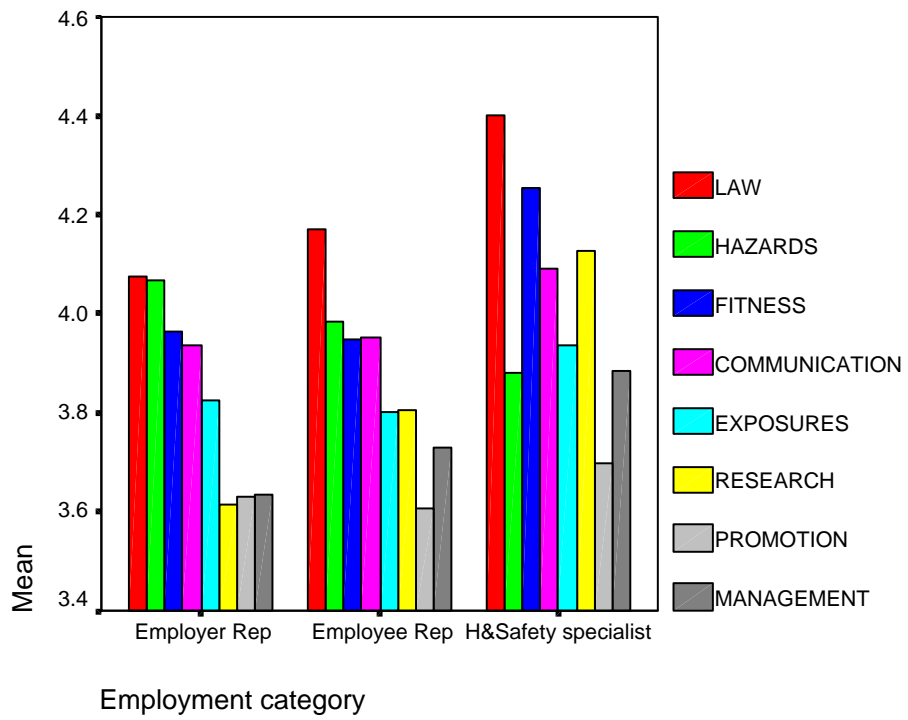


Figure 6b: Mean scores for EEF employers, employees and health and safety specialists

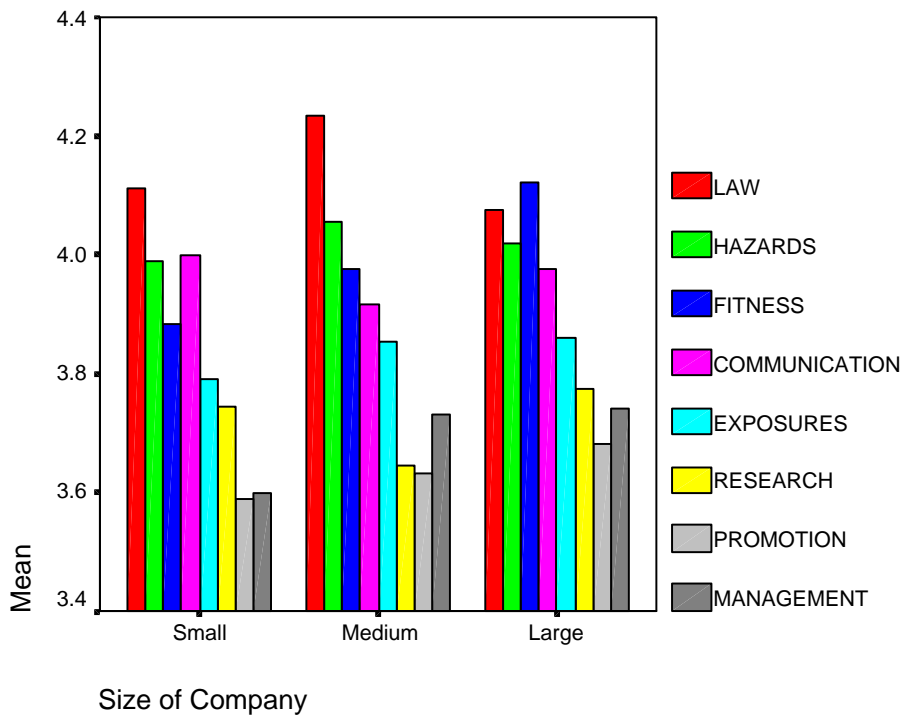
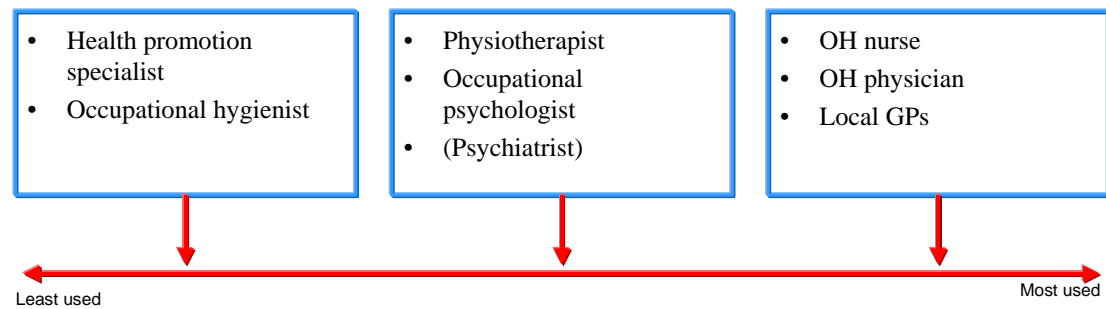


Figure 6c: Mean scores for EEF small, medium and large companies



**Figure 7. Usage of Occupational Health Professionals as rated by focus group participants**



## **13 APPENDICES**

**APPENDIX 1: Round 1 Delphi survey questionnaire**

## STUDY OF THE COMPETENCIES OF OCCUPATIONAL PHYSICIANS (OP) EMPLOYED BY INDUSTRY

Company Name:

Contact Name:

Designation:

Name of person answering questionnaire

Post held in Company

Company Address:

Telephone Number

Number of staff at above address (NB1) .....

Company nationality (NB2) .....

Parent Company\*\* .....

Total Group Employment\*\* .....

Type of business .....

Please indicate the turnover banding of your company by ticking the appropriate box

Up to £100,000  Up to £ 500,000  Up to £1,000,000

Up to £5,000,000  Up to £10,000,000  £50,000,000 plus

Please State .....

**Does your organisation consult an occupational physician? Y/N**

**If so, approximately, how frequently in a typical year?**

.....

...

\* if available ; \*\* If applicable;

Table

NB1: Include management staff, both full and part time based at the address

NB2: Country of Origin of parent company e.g. Scotland, England, USA, Germany, Japan etc.

**The following is a list of elements Occupational Physicians (OP) are expected to be competent in when they complete their training. How important are they to you? Please rate their importance using the scales described below.**

1=of least importance, 2=slightly important, 3= of average importance, 4=very important, 5=absolutely necessary

**A When dealing with Occupational Health Hazardsshould the OP be competent in assessing risks in the work place?**

- Yes**  *Please rank the specific task as shown below*  
**No**  *Please go to the question B*  
**Not relevant**  *Please go to the question B*

- |    |   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|----|---|----------|----------|----------|----------|----------|
| A1 | Assessing the work environment and evaluating risks   | ○        | ○        | ○        | ○        | ○        |
| A2 | Providing advice and information on measures to control risks                                 | ○        | ○        | ○        | ○        | ○        |
| A4 | Assessing health problems, liaising with other doctors and nurses and providing advice.       | ○        | ○        | ○        | ○        | ○        |
| A5 | Organising and monitoring programmes to check the health of people exposed to hazards at work | ○        | ○        | ○        | ○        | ○        |
| A6 | Assessing and advising on First Aid facilities  | ○        | ○        | ○        | ○        | ○        |
| A7 | Other (Please complete)   |          |          |          |          |          |

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<p>1=of least importance, 2=slightly important, 3= of average importance, 4=very important, 5=absolutely necessary</p>
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**B One of the duties of an OP is the assessment of disability and fitness for work.**  
Do you think it is important for an OP to be competent in these areas?

- |                     |                          |   |
|---------------------|--------------------------|---|
| <b>Yes</b>          | <input type="checkbox"/> | <i>Please rank the specific task as shown below</i> |
| <b>No</b>           | <input type="checkbox"/> | <i>Please go to the question C</i>                  |
| <b>Not relevant</b> | <input type="checkbox"/> | <i>Please go to the question C</i>                  |

		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
B1	Assessing injury, disability and handicap in relation to work	○	○	○	○	○
B2	Assessing fitness for the job	○	○	○	○	○
B3	Helping people to get back to work (rehabilitation)	○	○	○	○	○
B4	Assessing and advising on early retirement due to ill-health	○	○	○	○	○
B5	Evaluating absence from work due to sickness	○	○	○	○	○
B6	Advising on legal issues including the Disability Discrimination Act	○	○	○	○	○
B7	Advising on drug and alcohol problems	○	○	○	○	○
B8	Other (Please complete)					

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1=of least importance, 2=slightly important, 3= of average importance, 4=very important, 5=absolutely necessary

**C Do you think the OP should be competent in communicating?**

- Yes**  *Please rank the specific task as shown below*
- No**  *Please go to the question D*
- Not relevant**  *Please go to the question D*

			<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
C1	Reading, writing and speaking clearly in English		○	○	○	○	○
C2	Writing a report		○	○	○	○	○
	Table C3 Giving presentations to an audience using audio-visual equipment effectively		○	○	○	○	○
C4	Using language their audience can understand		○	○	○	○	○
C5	Applying legal and other ethical requirements for confidentiality		○	○	○	○	○
C6	Working effectively as a member, secretary or chair of a committee		○	○	○	○	○
C7	Liaising with other professionals to organise and deliver training		○	○	○	○	○
C8	Other (Please complete)						

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1=of least importance, 2=slightly important, 3= of average importance, 4=very important, 5=absolutely necessary
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**D Should an OP be competent in advising about the impact environmental exposures from the work place have on the general public and the workforce?**

- Yes**  *Please rank the specific task as shown below*  
**No**  *Please go to the question E*  
**Not relevant**  *Please go to the question E*

- |    |  |  | 1 | 2 | 3 | 4 | 5 |
|----|--|--|---|---|---|---|---|
| D1 | Understanding and explaining the difference between work-related and environment-related disease |  | ○ | ○ | ○ | ○ | ○ |
| D2 | Assessing and advising on the control of environmental exposures from the work place             |  | ○ | ○ | ○ | ○ | ○ |
| D3 | Recognising and advising on hazards in the general environment                                   |  | ○ | ○ | ○ | ○ | ○ |
| D4 | Other (Please complete)  |  |   |   |   |   |   |

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**E Should an OP be competent in promoting general health improvement programmes in the workplace? (eg. Cholesterol, stress, lifestyle, exercise, smoking etc..)**

- Yes**  *Please rank the specific task as shown below*  
**No**  *Please go to the question F*  
**Not relevant**  *Please go to the question F*

- |    |   |  | 1 | 2 | 3 | 4 | 5 |
|----|---|--|---|---|---|---|---|
| E1 | Assessing needs for health promotion  |  | ○ | ○ | ○ | ○ | ○ |
| E2 | Organising, providing and evaluating work related health promotion activities |  | ○ | ○ | ○ | ○ | ○ |
| E3 | Other (Please complete)   |  |   |   |   |   |   |

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1=of least importance, 2=slightly important, 3= of average importance, 4=very important, 5=absolutely necessary

**F Should the OP be competent in using research methods ?**

- Yes**  *Please rank the specific task as shown below*  
**No**  *Please go to the question G*  
**Not relevant**  *Please go to the question G*

			<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
F1	Convert a workplace health problem into a researchable question		○	○	○	○	○
F2	Search published literature		○	○	○	○	○
F3	Interpret scientific data in journals and from own research		○	○	○	○	○
F4	Plan data collection for simple surveys		○	○	○	○	○
F5	Be able to analyse and interpret data		○	○	○	○	○
F6	Use a computer for the storage and analysis of data		○	○	○	○	○
F7	Recognise and initiate the investigation of clusters of disease e.g. cancer in a work force		○	○	○	○	○
F8	Use other professional experts when appropriate		○	○	○	○	○
F9	Report on an investigation orally and in writing		○	○	○	○	○
F10	Other (Please complete)						

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1=of least importance, 2=slightly important, 3= of average importance, 4=very important, 5=absolutely necessary

**G In your opinion, should the OP be competent to perform managerial duties?**

- Yes**  *Please rank the specific task as shown below*
- No**  *Please go to the question **H***
- Not relevant**  *Please go to the question **H***

		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
G1	Managing an occupational health department	○	○	○	○	○
G2	Identifying the occupational health needs of an organisation	○	○	○	○	○
G3	Defining the goals and objectives of an occupational health service	○	○	○	○	○
G4	Defining the roles of occupational health staff and formulating job descriptions	○	○	○	○	○
G5	Organising record keeping using computers if appropriate	○	○	○	○	○
G6	Negotiating and managing a budget	○	○	○	○	○
G7	Encouraging the use of occupational health services	○	○	○	○	○
G8	Evaluating the quality of an occupational health service and carrying out clinical audit	○	○	○	○	○
G9	Selecting, appointing, supervising and appraising staff performance	○	○	○	○	○
G10	Designing a training programme for occupational health staff	○	○	○	○	○
G11	Lead a team of multidisciplinary service providers**	○	○	○	○	○
G12	Plan the efficient use of multidisciplinary resources	○	○	○	○	○
G13	Evaluate the service provided	○	○	○	○	○
G11	Other (Please complete)					

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\*\* Multidisciplinary service providers are organisations that have a number of disciplines involved in providing Occupational Health and Safety services

1=of least importance, 2=slightly important, 3= of average importance, 4=very important, 5=absolutely necessary

**H OPs should be able to advise on Occupational Health Law and Ethics.  
Do you agree?**

**Yes**  *Please rank the specific task as shown below*  
**No**   
**Not relevant**

		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
H1	Be well-informed about acts, regulations, codes of practice and guidance	○	○	○	○	○
H2	Advise managers, safety representatives and employees of their legal obligations under health and safety law	○	○	○	○	○
H3	Evaluate compliance with new legislation	○	○	○	○	○
H4	Other (Please complete)					

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*Thank you for completing this questionnaire, please return it in the prepaid envelope*

For any queries please contact :  
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E-Mail: K.N.Reetoo@clinmed.gla.ac.uk

## **APPENDIX 2: Round 2 Delphi survey questionnaire**

**To:**

**Dear Sir/Madam,**

We conducted a study a few months ago on the training of doctors specialising in Occupational Health (work related health matters) in which you, or one of your colleagues, might have participated. We thank you cordially for your collaboration. That survey identified the areas of training described in this questionnaire as the most important areas in training for these doctors. As part of this Delphi study, we are approaching you once more to request your help in establishing the priorities for the training of occupational health physicians in the UK. We would be grateful if you could, **in your opinion**, rank the training themes A, B and C in order of most important (1) to least important (3).

**Q1** Which of the following 3 training areas would you consider most important?

A	Communication (with management, the workforce and safety specialists)	
B	Assessing Occupational Health Hazards	
C	Occupational Health Law and ethics	

**Q2** Which of the following 3 training areas would you consider most important?

		<b>Rank</b>
A	Promoting health	
B	Assessing the impact of environmental exposures	
C	Research methods	

**Q3** In the area of **COMMUNICATION**, would you say that it is most important for the doctor to be good at:

		<b>Rank</b>
A	reading, writing and speaking clearly	
B	applying law and ethics for confidentiality	
C	communicating with other health and safety professionals	

**Q4** In the area of **ASSESSMENT OF DISABILITY AND FITNESS FOR WORK**, would you say that it is most important for the doctor to be good at:

		<b>Rank</b>
A	advising on disability and fitness for the job (including the Disability Discrimination Act)	
B	advising on rehabilitation and ill-health retirement	
C	evaluating sickness absence	

**Q5** In the area of **OCCUPATIONAL HEALTH LAW AND ETHICS**, would you say that it is most important that the doctor should be:

**Rank**

A	well-informed about the law, and codes of practice	
B	able to advise managers and employees about their legal obligations	
C	able to evaluate compliance with new legislation	

**Q6** In the area of **ASSESSMENT OF OCCUPATIONAL HEALTH HAZARDS**, would you say that it is most important for the doctor to be able to

**Rank**

A	assess risks at work and advise on control measures	
B	provide expert assessment and advice on health problems	
C	monitor the health of people exposed to hazards at work	

**Q7** In the area of **HEALTH PROMOTION**, would you say that it is most important for the doctor to be able to:

**Rank**

A	assess needs for health promotion	
B	organize, provide and evaluate health promotion activities	

**Q8** In the area of **ASSESSMENT OF THE IMPACT OF ENVIRONMENTAL EXPOSURES**, would you say that it is most important for the doctor to be able to:

**Rank**

A	Differentiate between work-related and environment-related health problems	
B	Assess and advise on the impact of environmental discharges from the workplace	
C	Liaise with other environmental specialists	

**Q9** In the area of **RESEARCH**, would you say that it is most important for the doctor to be good at:

		<b>Rank</b>
A	Investigating a workplace problem through research	
B	Analysing and explaining scientific data and research reports	
C	Investigating clusters of disease e.g.cancer in a work force	

**Q10** In the area of **MANAGEMENT**, would you say that it is most important for the doctor to be able to:

		<b>Rank</b>
A	Identify the occupational health needs of an organisation	
B	Set and achieve the objectives of the occupational health service	
C	Evaluate the quality of an occupational health service and carry out audit	

**Q11** Are there any other areas of training that you feel occupational health doctors should be trained in?

Thank you very much for your time. We will send you a report on the outcome of the study in the near future.

Dr. Nundita Reetoo  
 Research Assistant in Occupational Health

## **APPENDIX 3: Focus Group Discussion Guide**

## INTRODUCTION (10 mins)

- To the research: to understand needs of employers/employees in relation to staff health/safety/welfare and gauge required competences for occupational health physicians. Explain that a study has been conducted amongst academics/occupational health physicians but now want to explore from the customer's perspective.
- Reassure confidentiality and anonymity – MRS code of conduct
- Background: - ask each for a brief overview
  - nature of business
  - type of company/when established/company size
  - role within company
  - highs and lows of job

## KEY ISSUES/NEEDS (20 MINS)

- What are the key issues in relation to health and welfare of staff within your company
  - which issues do you see as general v sector/company specific
- Which issues cause concern/problems
  - To your company?
  - To you in your particular role?
- What recent health and safety issues have you had to deal with
  - How did you deal with these?
- What are your sources of advice/support when it comes to health/safety and welfare of staff?
  - Probe professionals (*Occupational Health Physicians, general physicians, GPs, Occupational Health Nurses, Health & Safety Specialists, other*), organisations (*Trade Unions, HSE, government departments*), secondary sources (*internet, trade journals, books*), etc.
  - Which have you found most/least useful?
  - What could be done to improve the current sources of advice/support available?
- What steps do you take in relation to health/safety and welfare of your staff? What actions do you take to promote health and safety within the workplace?
- Where do you believe the balance of responsibility lies for health/safety and welfare of staff?

Flip  
chart



- What do you believe the employer is responsible for?
- What do you believe the employee is responsible for?
- How do you keep up to date with employer legislation in terms of health and safety/welfare at work?
- What steps do you take to reduce absence through sickness?

### **USE OF OCCUPATIONAL HEALTH PROFESSIONALS**

- Thinking about the area of occupational health, what comes to mind when I say occupational people, what sort of roles/jobs come to mind within this area?
  - (Spontaneously then prompt with cards) – Occupational Health Physician, Occupational Health Nurse, Occupational Psychologist, Physiotherapist, Occupational Hygienist, Health Promotion Specialist
  - Gauge response to the range of occupational health roles.
- Which occupational health professionals have you had contact with?
  - What was the reason?
  - How happy were you with the service you received?
    - (Probe in detail for all positive and negatives aspects of service received)
- For the occupational health professionals discussed, what type of companies do you see them working for, what do you see as their role/purpose (discuss for those professionals where there is some knowledge)
  - How do you believe their roles differ?
  - What benefits do you believe occupational health professionals can provide to a company/organisation?
- What are the motivations and barriers to using occupational health professionals?
  - What could encourage you to consider using occupational health professionals on a more frequent basis (or at all if never used)?

## COMPETENCIES FOR OCCUPATIONAL HEALTH PHYSICIANS

- Show definition of Occupational Health Physician role –
- Thinking about the role of Occupational Health Physicians, what skills/competencies do you believe they need to fulfill their role? (Explore spontaneously, then explore with cards)
  - identification and assessment of occupational hazards to health within the workplace
  - assessment of disability and fitness for work
  - advising on impact of environmental exposures from the workplace on general public and workforce
  - promotion of general health improvement programmes in the workplace (e.g cholesterol, stress, lifestyle, exercise, smoking, etc)
  - competent in using research methods
  - advising on Occupational Health Law and Ethics (well informed about acts, regulations, codes of practice, advise on legal obligations, etc)
  - performing managerial duties (designing a training programme for occupational health staff, negotiating and managing a budget, identifying occupational health needs of an organisation, managing an occupational health department, etc)
  - competent in communicating (writing reports, using language audience can understand)
    - What do you believe is:
    - Most important/useful?
    - Least important/inappropriate?
    - Missing/should be included?
- Thinking about other occupational health professionals e.g Health and Safety Officer/Occupational Health Nurse – what competencies do you believe they require *versus* those required for a Occupational Health Physician.

### SUM UP (5 MINS)

- Given the context of this study, how do you feel about the fact that the Occupational Health profession is taking steps to understand the needs of users of their services in order to define competencies for Occupational Health Physicians?
- Given your needs from occupational health professionals, what three key pieces of advice would you give them in helping organisations and people in your roles?
- And how can they best make other people like you aware that they can fulfill these needs?

**THANK AND CLOSE**

## **APPENDIX 4: Statistical analysis data**

The tables in this appendix describe the results of the analysis of variance (ANOVA) between the mean scores of subject areas indicated for each of the respondent subgroups analysed (by company size, by company sector, business category and respondent employment category.). The mean difference is significant at the 0.05 level. But the differences at the 0.01 and 0.001 levels are also described.

## BY SIZE OF COMPANY

### SMALL COMPANIES

Small Companies	Mean scores	Law	Communication	Hazards	Fitness	Exposures	Research	Management	Promotion
Mean scores		4.17	4.08	4.07	4.02	3.97	3.83	3.80	3.69
Law	4.17		NS	NS	NS	NS	***	***	***
Communication	4.08			NS	NS	NS	*	*	***
Hazards	4.07				NS	NS	NS	*	***
Fitness	4.02					NS	NS	NS	***
Exposures	3.97						NS	NS	**
Research	3.83							NS	NS
Management	3.80								NS
Promotion	3.69								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001 NS: Not significant

### MEDIUM SIZED COMPANIES

Medium Companies	Mean scores	Law	Hazards	Fitness	Communication	Exposures	Research	Promotion	Management
Mean scores		4.27	4.12	4.04	4.00	4.00	3.91	3.80	3.71
Law	4.27		NS	NS	**	**	***	***	***
Hazards	4.12			NS	NS	NS	NS	***	***
Fitness	4.08				NS	NS	NS	***	***
Communication	4.00					NS	NS	*	**
Exposures	4.00						NS	NS	**
Research	3.91							NS	NS
Promotion	3.80								NS
Management	3.71								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001 NS: Not significant

### LARGE COMPANIES

Large Companies	Mean scores	Law	Fitness	Hazards	Communication	Exposures	Research	Promotion	Management
Mean scores		4.19	4.16	4.09	4.02	3.98	3.88	3.78	3.73
Law	4.19		NS	NS	NS	*	***	***	***
Fitness	4.16			NS	NS	NS	NS	***	NS
Hazards	4.09				NS	NS	NS	***	*
Communication	4.02					NS	*	***	*
Exposures	3.98						NS	**	NS
Research	3.88							NS	NS
Promotion	3.78								NS
Management	3.73								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

## BY COMPANY SECTOR

### PRIVATE SECTOR COMPANIES

Private companies	Mean scores	Law	Hazards	Fitness	Communication	Exposures	Research	Management	Promotion
Mean scores		4.17	4.08	4.04	4.00	3.94	3.82	3.74	3.74
Law	4.17		**	***	***	***	***	***	***
Hazards	4.08			*	**	***	***	***	***
Fitness	4.04				NS	**	***	***	***
Communication	4.00					**	***	***	***
Exposures	3.94						***	***	***
Research	3.82							***	NS
Management	3.74								**
Promotion	3.74								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### PRIVATE SECTOR COMPANY BREAKDOWN: EEF COMPANIES

EEF companies	Private	Mean scores	Law	Hazards	Fitness	Communication	Exposures	Research	Management	Promotion
Mean scores			4.144	4.024	4.002	3.962	3.839	3.723	3.699	3.637
Law	4.144			*	**	**	***	***	***	***
Hazards	4.024				NS	NS	***	***	***	***
Fitness	4.002					NS	***	***	***	***
Communication	3.962						**	***	***	***
Exposures	3.839							**	**	**
Research	3.723								NS	NS
Management	3.699									NS
Promotion	3.637									

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### PRIVATE SECTOR COMPANY BREAKDOWN: NON-EEF PRIVATE SECTOR COMPANIES

Other companies	Private	Mean scores	Law	Hazards	Fitness	Communication	Exposures	Research	Management	Promotion
Mean scores			4.055	4.013	3.994	3.993	3.872	3.877	3.813	3.758
Law	4.055			*	NS	NS	NS	**	**	**
Hazards	4.013				NS	NS	*	*	***	**
Fitness	3.994					NS	NS	*	**	**
Communication	3.993						NS	**	***	**
Exposures	3.872							NS	NS	NS
Research	3.877								NS	NS
Management	3.813									NS
Promotion	3.758									

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### PUBLIC SECTOR COMPANIES

Public companies	Mean scores	Law	Fitness	Communication	Hazards	Exposures	Research	Promotion	Management
Mean scores		4.29	4.24	4.09	4.07	4.06	3.97	3.78	3.75
Law	4.29		NS	***	**	**	***	***	***
Fitness	4.24			**	**	***	***	***	***
Communication	4.09				NS	NS	**	***	***
Hazards	4.07					NS	*	***	***
Exposures	4.06						NS	**	***
Research	3.97							*	***
Promotion	3.78								*
Management	3.75								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### PUBLIC SECTOR COMPANY BREAKDOWN: HEALTH AUTHORITIES

Health	Mean scores	Fitness	Law	Exposures	Communication	Hazards	Research	Management	Promotion
Mean scores		4.39	4.37	4.27	4.14	4.12	3.92	3.76	3.73
Fitness	4.39		NS	NS	**	**	***	***	***
Law	4.37			NS	*	NS	**	***	***
Exposures	4.27				NS	NS	**	**	**
Communication	4.14					NS	NS	**	*
Hazards	4.12						NS	**	**
Research	3.92							*	NS
Management	3.76								NS
Promotion	3.73								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### PUBLIC SECTOR COMPANY BREAKDOWN: POLICE AUTHORITIES

Police	Mean scores	Law	Communication	Fitness	Hazards	Research	Exposures	Promotion	Management
Mean scores		4.54	4.47	4.45	4.36	4.24	4.23	4.10	3.76
Law	4.54		NS	NS	NS	*	*	NS	**
Communication	4.47			NS	NS	*	NS	NS	**
Fitness	4.45				NS	NS	NS	NS	***
Hazards	4.36					NS	NS	NS	**
Research	4.24						NS	NS	**
Exposures	4.23							NS	**
Promotion	4.10								**
Management	3.76								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

**PUBLIC SECTOR COMPANY BREAKDOWN: FIRE AUTHORITIES**

Fire	Mean scores	Fitness	Law	Communication	Hazards	Research	Management	Promotion	Exposures
Mean scores		4.25	4.24	4.13	4.06	4.01	3.89	3.66	3.62
Fitness	4.25		NS	NS	NS	NS	*	**	***
Law	4.24			NS	NS	NS	*	**	***
Communication	4.13				NS	NS	**	**	***
Hazards	4.06					NS	NS	**	**
Research	4.01						NS	*	**
Management	3.89							NS	NS
Promotion	3.66								NS
Exposures	3.62								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

**PUBLIC SECTOR COMPANY BREAKDOWN: LOCAL AUTHORITIES**

Local Authority	Mean scores	Law	Fitness	Exposures	Hazards	Communication	Research	Promotion	Management
Mean scores		4.17	4.07	4.00	3.88	3.87	3.78	3.70	3.69
Law	4.17		NS	NS	NS	**	**	**	**
Fitness	4.07			NS	NS	NS	*	**	NS
Exposures	4.00				NS	NS	NS	*	*
Hazards	3.88					NS	NS	*	ns
Communication	3.87						*	NS	*
Research	3.78							NS	NS
Promotion	3.70								NS
Management	3.69								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

**PUBLIC SECTOR COMPANY BREAKDOWN: OTHER GOVERNMENTAL BODIES**

Other Public	Mean scores	Law	Exposures	Research	Hazards	Promotion	Fitness	Communication	Management
Mean scores		4.10	4.07	4.06	4.02	3.87	3.82	3.79	3.46
Law	4.10		NS	NS	NS	NS	NS	NS	NS
Exposures	4.07			NS	NS	NS	NS	NS	NS
Research	4.06				NS	NS	NS	NS	*
Hazards	4.02					NS	NS	NS	NS
Promotion	3.87						NS	NS	NS
Fitness	3.82							NS	NS
Communication	3.79								NS
Management	3.46								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

**TRADE UNIONS**

Trade Unions	Mean scores	Law	Hazards	Communication	Fitness	Research	Exposures	Management	Promotion
Mean scores		4.46	4.29	4.28	4.20	4.18	4.08	3.98	3.94
Law	4.46		NS	NS	NS	NS	NS	*	*
Hazards	4.29			NS	NS	NS	*	NS	**
Communication	4.28				NS	NS	NS	*	**
Fitness	4.20					NS	NS	NS	NS
Research	4.18						NS	NS	NS
Exposures	4.08							NS	NS
Management	3.98								NS
Promotion	3.94								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant



## BY Standard Industry Classification (SIC) CODING

### SIC CODING: MANUFACTURING SECTOR COMPANIES

Manufacturing companies	Mean scores	Law	Hazards	Fitness	Communication	Exposures	Research	Promotion	Management
Mean scores		4.23	4.09	4.06	3.99	3.91	3.75	3.70	3.70
Law	4.23		*	**	***	***	***	***	***
Hazards	4.09			NS	*	***	***	***	***
Fitness	4.06				NS	***	***	***	***
Communication	3.99					*	***	***	***
Exposures	3.91						***	**	***
Research	3.75							NS	*
Promotion	3.70								*
Management	3.70								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### SIC CODING: ENGINEERING AND CONSTRUCTION COMPANIES

Engineering and construction companies	Mean scores	Law	Hazards	Communication	Fitness	Exposures	Research	Promotion	Management
Mean scores		4.16	4.13	4.05	4.01	3.88	3.84	3.70	3.67
Law	4.16		NS	NS	NS	**	**	***	***
Hazards	4.13			NS	*	*	***	***	***
Communication	4.05				NS	NS	***	***	***
Fitness	4.01					NS	**	***	***
Exposures	3.88						NS	NS	*
Research	3.84							NS	*
Promotion	3.70								NS
Management	3.67								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### SIC CODING: TRADE SECTOR COMPANIES

Trade Businesses	Mean scores	Law	Hazards	Exposures	Fitness	Communication	Research	Promotion	Management
Mean scores		4.14	4.08	4.07	4.02	4.00	3.91	3.91	3.86
Law	4.14		NS	NS	NS	NS	**	0.005	***
Hazards	4.08			NS	NS	NS	**	0.006	**
Exposures	4.07				NS	NS	*	NS	**
Fitness	4.02					NS	*	NS	*
Communication	4.00						**	*	**
Research	3.91							NS	NS
Promotion	3.91								NS
Management	3.86								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### SIC CODING: PUBLIC SERVICE COMPANIES

Public Companies	Service Mean scores	Law	Communication	Fitness	Exposures	Hazards	Research	Management	Promotion
Mean scores		4.27	4.04	4.02	4.00	3.98	3.96	3.83	3.65
Law	4.27		*	*	*	*	**	**	**
Communication	4.04			NS	NS	NS	NS	*	*
Fitness	4.02				NS	NS	NS	NS	*
Exposures	4.00					NS	NS	*	NS
Hazards	3.98						NS	*	NS
Research	3.96							NS	NS
Management	3.83								NS
Promotion	3.65								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

## BY RESPONDENT EMPLOYMENT CATEGORY

### EMPLOYER REPRESENTATIVES

Employers	Mean scores	Law	Fitness	Hazards	Communication	Exposures	Research	Management	Promotion
Mean scores		4.12	4.03	4.02	3.97	3.90	3.76	3.72	3.67
Law	4.12		**	**	**	***	***	***	***
Fitness	4.03			NS	NS	**	***	***	***
Hazards	4.02				NS	**	***	***	***
Communication	3.97					**	***	***	***
Exposures	3.90						***	***	***
Research	3.76							**	NS
Management	3.72								NS
Promotion	3.67								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### EMPLOYEE REPRESENTATIVES

Employees	Mean scores	Law	Hazards	Fitness	Exposures	Communication	Research	Promotion	Management
Mean scores		4.28	4.22	4.12	4.10	4.04	3.96	3.91	3.74
Law	4.28		NS	**	**	***	***	***	***
Hazards	4.22			*	**	***	***	***	***
Fitness	4.12				NS	*	***	***	***
Exposures	4.10					NS	***	**	***
Communication	4.04						***	**	***
Research	3.96							NS	***
Promotion	3.91								***
Management	3.74								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### HEALTH AND SAFETY SPECIALISTS

H&S specialists	Mean scores	Law	Fitness	Communication	Research	Hazards	Exposures	Management	Promotion
Mean scores		4.24	4.19	4.13	3.94	3.94	3.88	3.76	3.61
Law	4.24		NS	NS	**	***	***	**	***
Fitness	4.19			NS	**	***	***	***	***
Communication	4.13				***	**	**	***	***
Research	3.94					NS	NS	*	**
Hazards	3.94						NS	NS	***
Exposures	3.88							NS	**
Management	3.76								NS
Promotion	3.61								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant

### TRADE UNIONISTS

Trade Unionists	Mean scores	Law	Hazards	Communication	Fitness	Research	Exposures	Promotion	Management
Mean scores		4.44	4.31	4.29	4.18	4.18	4.10	3.98	3.98
Law	4.44		NS	NS	NS	NS	NS	*	*
Hazards	4.31			NS	NS	NS	NS	*	NS
Communication	4.29				NS	NS	NS	**	*
Fitness	4.18					NS	NS	NS	NS
Research	4.18						NS	NS	NS
Exposures	4.10							NS	NS
Promotion	3.98								NS
Management	3.98								

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001; NS: Not significant





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