

Meeting workplace healthy building information needs

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ABSTRACT

This paper will review 6 years of experience in risk communication and meeting workplace information needs about the health effects experienced by people working in sealed buildings. The purpose of this paper is to discuss examples of the kinds of information that the workplace community is seeking and what answers can or cannot be provided.

In the past two decades, there has been a growing concern about potential chronic health effects of poor indoor air quality and mould. The Canadian Centre for Occupational Health and Safety receives approximately 200 such inquiries about indoor air quality and sick building syndrome every year from employees, employers and government agencies. The inquirers seek a definite answer and want to know whether or not their work poses any health risks. It is not possible to answer such a question in terms of 'yes' or 'no' since a scientific debate exists regarding a potential link between a wide range of health effects reported by building occupants and exposure to low levels of indoor air contaminants. Also, the response cannot be based on the occupational exposure limits set by different national and international organizations since these limits apply to industrial work environments and such levels of exposure are unlikely to occur in office buildings. Results obtained in this study indicate that the highest percentage of inquiries are about health effects, acceptable exposure limits and standard methodology for assessment and remediation of the problem. In conclusion, it will be useful to direct efforts to address these information needs of affected building occupants and building managers. The results of this analysis suggest topics that should be addressed by the scientific community.

INDEX TERMS

Building related symptoms; Mould; Health effects; Occupational health; Risk assessment

INTRODUCTION

In the past two decades, indoor air quality has been a popular topic in both media and scientific research (Niven *et al.*, 2000; Albright, 2001; Mendel *et al.*, 2002a,b). In particular, the possibility of adverse health effects from exposure to indoor air contaminants has attracted considerable media attention. One of the most widespread public concerns has been whether or not poor indoor air can cause immediate or chronic adverse health effects.

In view of the existing scientific uncertainty regarding cause–effect relationships, the task of providing hazard information to office workers and their families presents a special challenge. This paper presents an analysis of the health and safety information needs related to indoor air quality and sick building syndrome.

Public concern and, hence, the occupational exposure concerns, are triggered by media reports about new results. The following are some examples:

‘Calgary courthouse makes appeal judges sick, creates headache for province.’
[Source: *Canadian Press Newswire* May 24/01]

‘Your office may be making you sick.’

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[Source: Bad air day (Study), *National Post Business*, May 2001, p. 36]

‘Toronto—Employees at the Ontario Court of Justice (Metro West) have walked off the job because of bad air.’

[Source: http://www.nupge.ca/news_2001/news_se01/n06se01c.htm]

Faced with these concerns, people seek ‘expert opinion’ to determine whether or not their exposure involves health risk.

METHODS

The data used in this paper are taken from a database of information requests received during the period 1996–2002. The Inquiries Service of the Canadian Center for Occupational Health and Safety (CCOHS) provides free information to promote workplace health and safety. This service is primarily for Canadians with a small percentage of inquiries coming from other countries as well. The service is now available to people around the world via its website ‘OSH Answers’ at <http://www.ccohs.ca/oshanswers/>. The Inquiries Service received over 15 000 telephone requests for information during the fiscal year 2002–2003.

RESULTS

Inquiries

Inquirers are mainly from workplace parties -- employers, employees, the governments, consultants who provide service to workplaces, relatives of workers, organizations responsible for health and safety, and public interest groups. Figure 1 shows distribution of inquiries by sector in the year 2002–2003. Figure 2 shows numbers of OSH Answers inquiries received in the year 2002–2003.

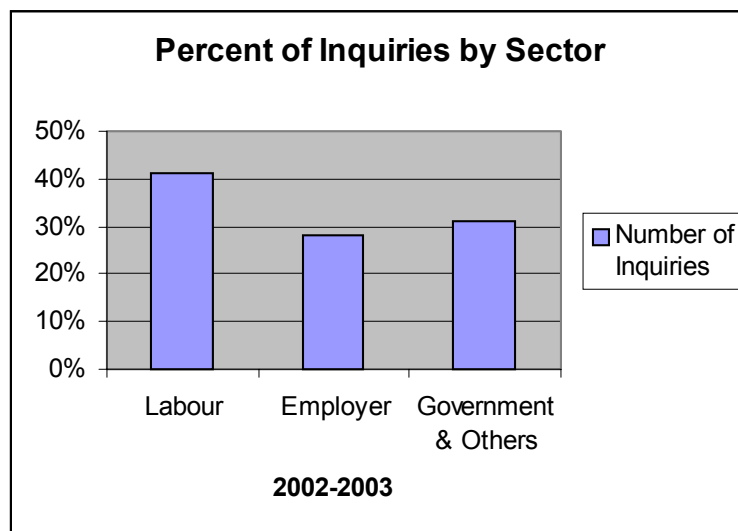


Figure 1 Distribution of inquiries by sector.

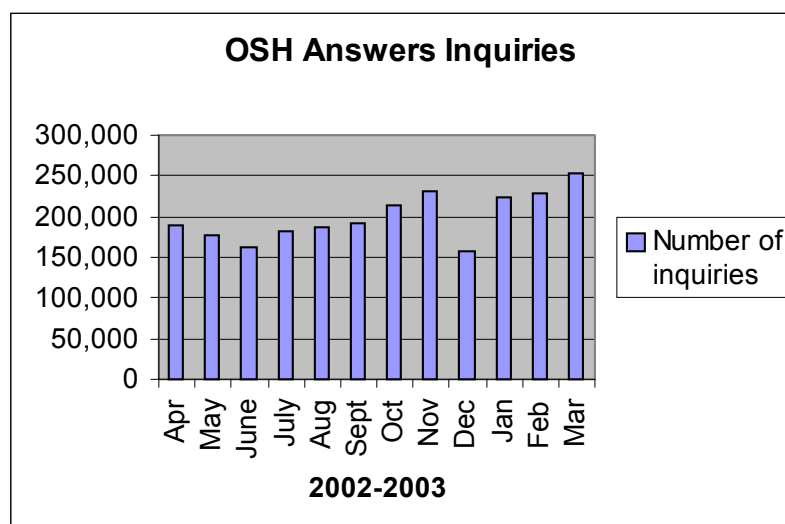


Figure 2 Number of OSH answers inquiries from 1 April 2002–31 March 2003.

Types of Questions

Typical examples of inquiries are:

- What are the acceptable levels for carbon dioxide in office air? What standards apply?
- As one of a group of concerned parents I'm worried about the appearance of mould and mildew at a local school, (especially *Stachybotras atra*)—what are the likely health hazards? Do you have any background information I can take to our school board trustees?
- Are there any regulations in Canada regarding indoor air quality in the workplace? How about for residential air quality? What are the applicable exposure limits?
- I manage a restaurant where the ventilation is inadequate to get rid of stagnant air and stale cooking odours, even cigarette smoke. How much make-up air should be provided and where can I get the kind of technical assistance I need to improve matters?
- How do we investigate a poor IAQ situation at work? What health effects should we look for?
- What are the permissible exposure limits for indoor air containing benzene, toluene, xylene and ethylbenzenes emitted from gasoline fumes, and total VOCs, that are applicable to a commercial environment?
- Are there specific protocols for testing indoor air quality in office buildings in Canada? For example, how often and for what contaminants?
- What is this 'Sick Building Syndrome' I keep hearing about?
- What are the typical levels found for total volatile organic compounds (VOCs) in office air? How do they compare with recommended levels?

Table 1 summarises the type of information requested.

Table 1 Types of information requested 1996–2002		
Ventilation	397	31%
General/health effects	256	20%
Assessment	161	13%

Sampling/referral to consultants	161	13%
Sick building syndrome	83	6%
Standards, guidelines, regulations	73	6%
Others (miscellaneous)	78	6%
Airborne contaminants	46	4%
Guidance document(s)	33	3%

Intended Use of Information

In general, the inquirers request information so that they are able to:

- Develop a scientifically accurate awareness about the potential or absence of a hazard.
- Recognize the hazard.
- Develop a strategy to deal with the hazard.
- Ask their employer to do something to eliminate or control the risk of illness and injury.
- Implement health and safety program

It is, therefore, very important that the health risk information is communicated accurately and understandably in plain, non-technical language.

Types of Answers Sought

Ideally an inquirer needs (or wants) a clear answer of 'yes', 'no', 'safe', or 'unsafe'. Often, our scientific knowledge does not enable us to provide such an answer. Instead, we have to deal with scientific conclusions such as:

- The results are inconclusive.
- More research is needed.
- Exposed people are at higher risk but the data is not statistically significant.
- Our data do not confirm the risk reported in an earlier paper.

The scientific uncertainty does stimulate more research, but it also leaves the subjects of such research wondering whether or not they should do something to protect themselves. These psychosocial concerns need attention, as do the occupational hazards. We cannot ask people to wait until the researchers have found the final answer. What if the final answer confirms a definite health risk?

As the scientific community continues to debate whether or not a particular effect is real, exposed people continue to worry about their health and well being. We cannot ask them to wait until scientists make up their minds. Even if we did, what would be the cost of waiting? The risk communication poses a special challenge in this situation.

DISCUSSION

Most jurisdictions do not have regulated exposure limits specific to indoor air quality. Voluntary organizations such as the American Conference of Governmental Industrial Hygienists (ACGIH) have recommended exposure guidelines which are generally used as a guide to limit occupational exposures in the industrial work environment. The Threshold

Limit Values (TLVs) recommended by the ACGIH are widely used as exposure limits. Indoor air exposures are generally far below these exposure limits.

In the absence of the scientific basis for exposure limits for indoor air, prudent avoidance is generally recommended. Prudent avoidance is avoiding all unnecessary exposures and depends on subjective judgement. (Pathak *et al.*, 2000)

CONCLUSIONS AND IMPLICATIONS

As a tripartite (labour, government and employer) organization, CCOHS meets the challenge in answering inquiries by acting as a 'communicator' of facts and not as an advocate of a particular school of thought on the issue. This involves customizing the communication to help the inquirer achieve his or her goals. We present the current state of knowledge, explain its implications in a given workplace situation, and assist the inquirer in making his or her own decisions. This involves the following steps:

Define the exposure situation: We help the inquirer describe how the exposure might be occurring from a particular source of operation (i.e. kind of source, occasional exposure or prolonged, repeated exposure, etc.) This gives an idea about the type of exposure, its magnitude, and whether or not it could be a cause of concern.

Options for eliminating or minimizing the exposure: As we do not know the safe exposure limit, we present options to minimize exposure and assist in identifying one that is practicable in a particular situation.

Evaluate the risk of doing nothing about the existing situation: Based on available scientific data, we explore possible consequences if nothing is done to prevent or minimize the exposure.

Make a judgement by taking into account scientific, social, and economic factors: Zero exposure is probably the safest, but may not be economically feasible or socially adaptable. We assist the inquirers in making choices that suit their work situations.

The ultimate objective of hazard communication is to empower people with information that helps them develop safe work practices. The success in achieving this objective depends on the degree of confidence that people have in the information and the information provider. The basic ingredients needed to build this confidence include:

- unbiased information;
- accurate and current scientific data;
- open communication;
- mutual trust and respect;
- empowerment;
- common goals;
- team spirit;
- continuous improvement;
- care/camaraderie.

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