

# PostScript

## LETTERS

### Sickness absence in doctors

Kivimaki *et al*<sup>1</sup> undertook research to identify some determinants of sickness absence in Finnish hospital physicians between 1997 and 1998. This was a questionnaire survey sent to 816 physicians and a control group of 542 senior nurses employed in one of 11 hospitals in Finland. Social circumstances, work characteristics, and various measures of health were assessed by questionnaire and employers' registers were used to assess recorded sickness absence.

There are some limitations in the study design and subsequent conclusions that are not acknowledged in the text.

The response rate from the physicians was a disappointing 55%. Nearly half of the physicians approached did not participate in the study. This could bias the results considerably. The authors state that the response rate obtained in this study corresponds to that obtained in previous research. Seven references are cited as evidence. The response rates of doctors from six of the seven quoted papers are higher than 55% and are as follows: 82%<sup>2</sup>; 79% and 76%<sup>3</sup>; 63%<sup>4</sup>; 78%<sup>5</sup>; 58%<sup>6</sup>; and 87%–94%.<sup>7</sup> The authors could have cited a further reference<sup>8</sup> that was used later in the paper, but chose not to (response rate 80%).

The authors state that the recording of attendance is reliable in the Finnish public sector. This would be a very important factor in the context of this study of sickness absence in hospital physicians. The authors cite two references<sup>9,10</sup> to back up their statement. These two studies both concern local government workers in Raisio, Finland between 1990 and 1995 with the main outcome measure being recorded medically certificated absence held on computer by an occupational health unit. Both of these papers simply state that all sick certificates must be forwarded for recording, but provide no other evidence that the recording of sickness absence is reliable. The possibility that doctors might underreport sickness absence, leading to incomplete recording, is not considered. This could add further bias to the study, thereby affecting the results and conclusions.

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### Author's reply

In his electronic letter, Murphy wrote that the 55% response rate from the doctors could have considerably biased the results reported in a study of sickness absence in Finnish hospital physicians.<sup>1</sup> According to the results, absence rate for doctors is low. The study also suggests that poor teamwork and traditional psychosocial risk factors—such as work overload and low job control, contribute to long term sick leave among doctors.

As already reported in the article (page 362), hospital registers show that low response rate did not affect the findings on absence rates. In those who responded to the survey, the rate of short term (1–3 days) sickness absences was 38.0 spells per 100 person-years. The corresponding rate for the eligible population was 37.9 spells per 100 person-years. Regarding the rate of long term (<3 days) sickness absences, the rate was exactly the same for the respondents and the eligible population—20.2 long sickness absence spells per 100 person-years.

Bias due to low response rate seems also unlikely relative to psychosocial factors. In work units with a response rate lower than 55%, the mean scores of teamwork and job control were 3.5 and 4.0, respectively. In work units with a response rate of 55% or higher, the corresponding mean scores were also 3.5

and 4.0, respectively. In the overload scale, the mean score of 3.8 in the units with a low response rate did not differ from the mean score of 3.6 in the units with a high response rate ( $p=0.130$ ).

Murphy acknowledges that incomplete recording of sickness absences could also affect the results and conclusions. However, at least the following points suggest that the recording of long term sickness absences of doctors was reliable.

Firstly, Finnish hospitals receive compensation for loss of salary due to sick leaves longer than 10 days from the Social Insurance Institution, a body subordinate to Parliament. To receive all the compensation to which the hospitals are entitled, they are motivated to keep strict records of sick leaves. This was especially true during the study period. Hospitals had a shortage of financial resources compared with the amount of services they were expected to provide.

Secondly, indicators of health problems—such as poor self rated health, presence of diagnosed chronic disease, and psychiatric morbidity (as indicated by caseness in the general health questionnaire)—were associated with long spells of sickness absence (see table 3 in the article).<sup>1</sup> For doctors, these associations were as strong as or stronger than those found for the controls. Only the opposite case—if the associations had been weaker for doctors—could have been an indication of unreliable measurement of sickness absence of doctors.

Thirdly, the low recorded rate of absence for hospital physicians is well in line with other research. Results on self reported absences in a random sample of Finnish physicians suggest that physicians are on sick leave much less often than other employees.<sup>2</sup> According to a British study, over 80% of physicians had worked even when they felt too unwell to carry out their duties to the best of their ability.<sup>3</sup> A Norwegian study reports that 80% of the physicians had worked during an illness for which they would have sick listed their patients.<sup>4</sup>

In conclusion, evidence and additional analyses provide no support for the possibility that the issues listed by Murphy would have added bias to the study on sickness absence in Finnish hospital physicians.

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## Offspring sex ratios of people exposed to dioxin and dioxin-like compounds

Yoshimura *et al*<sup>1</sup> reported that although exposure to dioxin (TCDD) (after the explosion at Seveso) was associated with a subsequent significant and substantial drop in offspring sex ratio (proportion male),<sup>2</sup> there was no obvious similarity in the offspring sex ratios after accidental ingestion of polychlorinated biphenyls (PCBs) and dibenzofurans (PCDFs) in Yusho, Japan,<sup>3</sup> and Yucheng, Taiwan.<sup>3</sup> PCBs and PCDFs are toxicologically similar to (although less potent than) TCDD. The authors wrote that in Taiwan, despite exposure to chemicals similar to TCDD sufficient to produce obvious clinical disease, the sex ratio was not altered. They inferred that sex ratio is unlikely to be a sensitive indicator of exposures to chemicals such as PCBs, PCDFs, and dioxins. The argument is not decisive and Yoshimura *et al*<sup>1</sup> called for further research.

I had predicted<sup>4</sup> Mocarelli's low paternal offspring sex ratio on the basis of the known endocrine effects of dioxin on exposed men.<sup>5</sup> The basis of my prediction was a hormonal hypothesis of mammalian sex determination, the evidence for which was later summarised.<sup>6</sup> So I suggest a direction for the further research suggested by Yoshimura *et al*.<sup>1</sup>

My hypothesis proposes that the sexes of mammalian (including human) offspring are partially dependent on the hormone concentrations of both parents around the time of conception. It is thought that high levels of estrogens and testosterone are followed disproportionately often by sons; and high levels of gonadotropins and progesterone by daughters. This being so, a contaminant released into the atmosphere or water sources may in principle have opposing tendencies on the offspring sex ratios of exposed mothers and fathers and thus—without further examination—remain undetected. As already suggested, the known effect of dioxin is to lower men's testosterone/gonadotropin ratio, thus predisposing them to sire daughters. By contrast, the effect of this class of chemicals on women is (under some circumstances) estrogenic,<sup>7-11</sup> predisposing them to produce sons. If this were correct, the point would be revealed by examining the sex ratios of offspring of exposed men mated to unexposed women, and vice versa, as was done by Mocarelli *et al*.<sup>2</sup> The data of these authors are suggestive but not decisive in this context. The offspring sex ratio of their exposed mothers married to unexposed fathers was higher (but not significantly higher) than the expected overall population sex ratio in Italy at that time. I suggest that workers try to ascertain data of this sort from people exposed in Yucheng and Yusho; and in Vietnam. Lastly it would be useful to have experimental animal data on the point.

W H James

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### Authors' reply

We thank James for his comments<sup>1</sup> about our paper on sex ratio in offspring of affected parents of Yusho.<sup>2</sup> He suggests ascertaining information on exposure of parents to examine his hypothesis that the sexes of offspring partially depend on the hormone concentrations of both parents around the time of conception. Three combinations of parent pairs according to exposure could be possible in the Yusho incident; a pair of an exposed father and a non-exposed mother, a pair of a non-exposed father and an exposed mother, and a pair of both parents exposed. He suggested that the first two types of pair should be informative to his hypothesis, because the first pair would be more likely to have daughters and the second likely to have sons.

In the Yusho incident, affected people were likely to be clustered into families, because the contaminated rice oil was mainly distributed as family cooking oil; therefore, for those who were married at the time of the incident, both husband and wife were likely to be exposed to the dioxin-like compounds. Affected single people, who were living with their family at the time of the incident and were subsequently married, can give some information towards his hypothesis, but cannot be followed up until they have married and had children. This was not done because the follow up time was too short.

We agree with his suggestion that follow up must be extended to ascertain the sex of offspring born to the affected single people at the time of the incident. We are making an effort to conduct such a study; but we are facing difficulties from increasing socioethical concerns of the public—that is, protection of privacy and informed consent for epidemiological studies in recent years in Japan.<sup>3</sup>

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## BOOK REVIEW



### Pocket Guide to Eczema and Contact Dermatitis

By C Holden, L Ostlere. (Pp 112; £14.95) 2000. Oxford: Blackwell Science. ISBN 0 632 05663 0

This is one of several small well illustrated books on dermatology that have appeared during the past few years. Dermatology is a specialty that lends itself to good illustration and the photographs in this book are excellent. But how many different eczemas are there? For each a short paragraph of definition is provided, followed by a note on aetiology and then an illustrated summary of the clinical features. From the point of view of an occupational physician the section on contact dermatitis is very helpful. Patch testing is well described and the authors explain when it should not be done. This is an unusual feature. As a short book that you can page through rapidly this would be difficult to equal.

R L Maynard

### Chemistry and Specifications of Pesticides (WHO Technical Report Series 988)

16th report of the who expert committee on vector biology and control. (Sfr 14.00 (Sfr 9.80 in developing countries)) 2001. Geneva: World Health Organisation

This booklet in the technical report series of the World Health Organisation (WHO), is one of a series of periodically published booklets on the chemistry and specifications of pesticides that are used in vector control, mostly in developing countries. The book comprises an introduction, which lists the questions asked of the expert committee. The next section explains the role of the WHO pesticide evaluation scheme (WHOPES). The third section deal with trends in pesticidal use for vector control, starting appropriately with Africa, the WHO region with the greatest burden of tropical disease. It is educational to compare the pattern of use of pesticides in, for example, malaria control, with the use of pesticides in northern countries. The scale of use of DDT is notable. The other regions specifically covered are the Eastern mediterranean, south east Asia and the western Pacific. The risk that the increased dependence on

synthetic pyrethroids will encourage the emergence of resistant strains of vectors, the control of which is sought, is touched upon. The next section deals with analytical methodology and quality control in developing countries. The problems of products with lower concentrations of active ingredient than is declared, including the loss of vector control, and perhaps more importantly, the emergence of resistance, are pointed out. The WHO collaborating centres for the quality control of pesticides in Argentina, Belgium, and Pakistan are a welcome step toward rectifying this problem. In section 5, the specifications of the WHO and Food and Agricultural Organisation of the United Nations (FAO) are discussed, together with the Expert Committee's recommendation that the WHO and FAO should build up a common system for the development of specifications for pesticides. Containers, packaging, marking, storage, and disposal are covered in the next two sections; labelling is an obvious problem in countries that have considerable proportions of their populations illiterate, or in which labelling should be carried out in many languages. Lastly the committee acknowledges its collaborators. The annexes will be the most useful part for the working analyst. Annex 1 lists changes to existing specifications and annex 2 lists recommended specifications for new pesticides and formulations as well as new test methods. This booklet will be most useful for those selling, buying, analysing, or using pesticides in tropical countries for vector control. The publication is also of general interest to pesticide scientists, giving as it does an idea of the major problems still posed by vector borne diseases, and the place of pesticides in their control.

T C Marrs

### Indoor air quality sampling methodologies, 1st edition

By K Hess-Kosa. (Pp 300; £59.99). 2001. Boca Raton, FL, USA: Lewis Publishers, CRC Press. ISBN 1-56670-539-8

By its very nature, indoor air quality is a vast subject with a comprehensive and rapidly expanding literature of its own. A text that concentrates solely on sampling methodologies rather than a multitude of analytical methods for a plethora of indoor air pollutants is therefore to be welcomed.

Hess-Kosa's book comprises four principal sections which deal with the planning and structure of an indoor air quality investigation, sampling for bioaerosols, chemicals, and dusts. Each section has chapters on groups of pollutants which consider occurrence, sampling strategy, sampling methodologies, an overview of analytical methods, and brief guidance on interpretation of results. Overall the book covers most common substances that air quality investigators are likely to encounter in the field. It is moderately well illustrated with black and white photographs and line diagrams.

The section on bioaerosols encompasses pollens and spores, viable microbial allergens, and toxigenic microbes. The section dealing with chemicals covers volatile organic compounds, mould volatile organic compounds, carbon dioxide, carbon monoxide, formaldehyde, and product emissions. It is perhaps surprising that other important indoor air pollutants such as nitrogen dioxide, radon, tobacco smoke, and semivolatile organic compounds are not included. The section on dusts covers dusts in general and animal allergenic dusts (mites and insects).

The book is intended for environmental professionals and industrial hygienists. It will be useful background reading for those at the start of their careers and will be helpful additional material for first degree students in environmental science or occupational hygiene who are undertaking an "air pollution" module. It is written in a colloquial American style, which, although easy to read and understand, British students may find a little clumsy in places. The book focuses very strongly on air quality investigations in commercial and office buildings; hence some of the detail about sampling strategies is not relevant to investigations in homes and other residential accommodation. It is also written in a North American context and concentrates on United States Environmental Protection Agency and National Institute for Occupational Safety and Health procedures and methods. These may not be directly applicable to investigations in the United Kingdom. There is, for example, little if any reference to the World Health Organisation air quality guidelines for Europe, the United Kingdom Government's air quality strategy, or any of the Health and Safety Executive methods of determination of hazardous substances.

Students are likely to find the parts of the book which deal with biological aspects of indoor air quality, which account for over one third of the text, to be the most helpful.

The chapter on volatile organic compounds is somewhat weak and does not give sufficient explanation of the concept of total volatile organic compounds and its limitation. It is somewhat superficial in its treatment of sampling by adsorption on porous polymers and does not mention diffusive sampling at all, a significant omission. The discussion of automated thermal desorption gas chromatography with mass spectrometric identification of substances (surely the technique of choice for most investigators of volatile organic compounds in buildings) is inadequate, although it could be argued that this was more to do with analysis than sampling. The chapter on formaldehyde similarly does not consider diffusive sampling methods which are now widely used.

The section on dust again lacks detail, particularly on size distributions and the theory of operation of size selective samplers. There is no real discussion of aerodynamic diameter or the concept of respirable particles, for example. It is best regarded as an introduction to a complex subject. The practical hints on settled dust sampling are, however, useful.

In summary this book is informative, but not essential reading for investigators of indoor air quality.

J W Llewellyn

### Indoor environmental quality

By T Godish. (Pp 461; £59.99) 2001. Boca Raton, FL, USA: Lewis, CRC Press. ISBN: 1 56670 402 2

Professional and public concern about the quality of the indoor environment has grown significantly in the past decade or so, and there are now several books available to the interested reader. This volume by Godish is an important contribution and is very much focused on practical aspects.

Books on indoor environmental quality tend to compartmentalise the salient issues into risk assessment aspects, such as pollutants and their sources, human exposure, and health effects, and building aspects such as ventilation and air conditioning. In part this reflects the likely audience: health professionals or architects, engineers or building managers.

The value of Godish's book is that it takes a very broad view of indoor environmental quality and attempts to show the connections between different aspects of this complex subject. He attempts to provide valuable and meaningful information to anyone interested in this field, whether from an academic or applied perspective. It has often been said that tackling the problems of indoor air quality requires a multidisciplinary approach, and the author has certainly attempted to bring together all relevant considerations. Of course, the danger of such an approach, in such a relatively small volume, is that detail is lost and reference sources are limited. Thus, for example, this is not likely to be the first or best book to turn to for detailed information on concentrations of air pollutants in dwellings or toxicological aspects of particular substances.

The book has a good style and is eminently readable. It is firmly grounded in "hard science" and is commendably even handed in the way information is presented. Although, surprisingly perhaps, multiple chemical sensitivity does not even get a mention, there is adequate and measured coverage of sick building syndrome and similar aspects of problem buildings. The chemical, physical, and engineering aspects of indoor air quality and its investigation are generally very well covered in the book, reflecting the author's eminent background and experience in indoor air pollution control and management.

The 13 chapters of the book cover building characteristics, some inorganic contaminants, combustion generated pollutants, organic contaminants, biological contaminants, problem buildings, the investigation of indoor environment problems, measurement of indoor contaminants, source control, ventilation, air cleaning, and regulatory and non-regulatory initiatives. Unsurprisingly, perhaps, the book focuses on buildings, although transport environments (including space capsules!) do get a mention in the first chapter. There is something of a United States bias throughout the book, but this is really only noticeable in the section on regulatory and non-regulatory initiatives.

An interesting feature of the book is the provision of a list of questions at the end of each chapter, which help to focus the reader on the important issues covered and presumably also provide important cues to student readers.

In summary, the book provides an excellent introductory overview to almost all aspects of the indoor environment of buildings. Although lacking in depth consideration of the full range of topics it tackles, it has sufficient well sourced information to give a very good flavour of the key issues, and is of very practical value. The book is accessible and up to date; at £59.99 it represents reasonable value for money and should prove a useful resource to both students and indoor air investigators.

P Harrison

### Systematic occupational health and safety management; perspectives on an international development.

K Frick, P L Jensen, M Quinlan, *et al.* (\$105) 2000. Amsterdam: Pergamon, ISBN 0080434134

This book provides a mine of information on the development of formalised health and safety management systems across the



developed world. Such systems provide a comprehensive framework for policy development, risk assessment, risk management, and evaluation of effectiveness for an organisation. The text includes historical insights into their genesis as well as geographical perspectives on the ways in which such systems align themselves with the sociopolitical climates of each country. The quality of this analysis is high and, on the topics with which the reviewer is familiar, perceptive. Two areas of weakness in what is otherwise a deep and thoughtful book are the ways in which systems are tailored to risks and the boundaries of a health and safety system.

The focus throughout is on the concepts and intricacies of management systems. The nature of the risks which justify their introduction and the tools for the evaluation of their effectiveness are not covered in any detail. Hence it may not satisfy readers solely interested in the study of specific risks or the evaluation of the effectiveness of particular interventions. There are few detailed examples or case studies. In particular there is little or no consideration of the distinguishing features of risks to health and to safety.

Any managerial topic has boundaries and the way in which these are handled can make a major contribution to the quality of management. There is little exploration of the boundaries between health and safety systems and approaches to environmental control, to employee health and performance at work or to product quality assurance. All these can be major influences on health and safety arrangements and they can also often help to justify a systematic approach to its management.

The chapters take the form of largely free standing essays around a central theme and several are particularly useful analyses. Two cover the development and implementation of the European Union "framework directive" 89/391. They provide valuable insights into the way in which system concepts are reviewed, set into a legal framework and then put into practice in various countries with differing social agendas and legal systems.

The effects of "precarious employment", in a fractured and casual labour market are masterfully discussed. In doing so the time warp existing between the current world of work and many regulatory and social partner

approaches to health and safety is clearly exposed. On a related topic the practical difficulties of applying systematic approaches to health and safety in small enterprises are well described in terms of challenges, although their acceptability and benefits are not compared with those of simple prescriptive methods backed by effective enforcement.

The benefits of placing expertise in multi-disciplinary health services are reviewed. However, the specific contributions of experts in technical and human sciences to the various stages of the management process is not analysed in detail nor are the options of in house, contract, or ad hoc expert support assessed.

As a general textbook or source of reference the book has limitations, one of which is rather limited indexing by subject. As a place for finding valuable and refreshing insights into the way in which a major new strand in prevention of harm from work has evolved it has little competition and will stand as a valuable record for the future. The book is not comprehensive, but as its title indicates, it is a source of valuable perspectives on international practice and its determinants.

T Carter

## NOTICES

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