Conclusion. Whether the observed excess of lung cancer and other lung effects among workers in the Norwegian SiC industry is related to exposure to SiC fibers or to other dust components is unclear. Based on improved exposure information, we will examine exposure effect and exposure response relationships further, with particular emphasis on SiC dust/fibers as potential causative agents.

References

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P037 Occupation, smoking and lung function impairment in a traditional industrial area from Catalonia, Spain

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Background. Few studies have investigated the independent effects of occupational exposures and smoking on chronic bronchitis and airflow obstruction We aimed to assess the association between lifetime occupational exposures and airflow obstruction in a cross-sectional survey of a traditional urban-industrial area of Catalonia, Spain.

Methods. We interviewed 576 subjects of both sexes aged 20-70 years (response rate 80%) randomly selected from census rolls, using the standardized American Thoracic Society questionnaire. Forced spirometry was performed by 497 subjects, and lung function parameters were compared to sex-, age- and height-specific predicted values.

Results. Lifetime occupational exposure to dust, gases or fumes was reported by 52% of the subjects (63% in men, 41% in women). Textile industry was the most frequently reported job in relation to these exposures (39.3%). Chronic cough, expectoration and wheeze was more prevalent in exposed subjects; odds ratios ranged from 1.2 to 2.3 being highest among never-smokers (1.9 to 4.6). Exposed subjects had a lower lung function than non-exposed subjects. Lung function differences were dependent on age and duration of exposure, but not on smoking habits. The biggest exposure-related effects on lung function were found for subjects under age 45 who had been exposed ≥20 years (FEV1 -3.1%; 95% confidence interval (CI) -8.4 to 2.2; MMEF -12.5%, CI -23.3 to -1.6; FEV1/FVC ratio -3.4%; CI -6.3 to -0.6), and for subjects above age 44 who had been exposed 10-19 years (FEV1 -6.4%; CI -12.2 to -0.5; MMEF -16.7%; CI -30.3 to -3.1; FEV1/FVC ratio -6.7%; CI -10.5 to -2.9).

Conclusions. We conclude that chronic bronchitis type symptoms and lung function impairment are related to the duration of occupational exposure, being independent of the effect of smoking.

P038 Health surveys of Montserratians

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Background. Since the volcanic eruption on the island of Montserrat in 1995, residents have been exposed to sometimes high concentrations of volcanic ash, containing 5% to 20% cristobalite. The Southern part of the island has been evacuated and former residents have moved to the North of the island or relocated to other countries, including the UK. Possible health risks of volcanic ash exposure include the non-specific respiratory effects of high concentrations of particulates and the possible risk of silicosis, although silicosis usually develops following prolonged occupational exposure to high concentrations of silica. A full programme of studies of the volcanic ash has taken place, including toxicological and epidemiological studies. We are currently completing two linked epidemiological studies of the health of Montserratians: one, a study of Montserratians who have relocated to the UK and the other a study of workers, still resident on the island, who were exposed occupationally to volcanic ash.

Objective. The aim of the studies was to identify any increased risk of respiratory ill-health which might be associated with volcanic ash exposure and in particular to obtain early warning of any associated risks of silicosis.

Methods. Following a pilot study, data from Montserratians in the UK were collected by postal questionnaire. Data recorded included personal details, respiratory symptom occurrence, smoking habit, lifetime occupational history and other responses designed to assess potential exposure to volcanic ash. Questionnaires were completed by 465 respondents. For the Montserratian workers, a medical survey was carried out on the island comprising a respiratory symptoms questionnaire, based on that used in the UK study, lung function tests and a chest radiograph. 421 subjects attended survey. Estimated volcanic ash concentrations were available from a number of dust surveys which had taken place on the island since 1995. These were combined with the information provided in the questionnaire to calculate exposure indices for each participant.

Results and Conclusions. Draft reports have been prepared for both studies, but have not been finalised. By prior agreement with the relevant UK Government departments, who funded the studies, we have undertaken not to release any results until the reports are finalised. However, we would intend to present results on the prevalence of respiratory symptoms and radiological changes, levels of lung function, exposure-response relations, consistency between the two studies, consistency between the epidemiology and toxicology study results and a comparison of these results as a whole with other well-studied dusts.

P039 Prevalence of respiratory symptoms among female flight attendants and teachers

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Background. Indoor air quality has generated considerable concern and controversy over the past decade. Two occupational groups that have been a focus of recent interest are flight attendants and school teachers. Indoor air quality problems in aircraft cabins and in schools may be very different from those observed in commercial office buildings primarily because occupancy in both settings is generally more dense, and ventilation rates per occupant are lower. We analyzed the self-reported prevalence of respiratory symptoms in these two groups, using data from national surveys for comparison.

Methods. Data for this analysis were collected as part of a larger study of reproductive health among female flight attendants. Respiratory symptom questions were based on those used in national surveys and included: itchy/irritated/watery eyes, stuffed/blocked/itchy/runny nose, sore/dry throat, wheezing/whistling in chest, cold/flu, chest illness, and physician-diagnosed asthma. For eye, nose, and throat symptoms, respondents were asked if the symptoms improved on non-work days. Prevalence rates for each of the symptoms were calculated, stratified by smoking status.

Results. A total of 1,285 flight attendants (FAs) and 221 teachers, who were never-smokers, provided data for the main analysis of respiratory symptoms. FAs and teachers were significantly more likely to report work-related eye (12.1% and 6.7 %, respectively), nose (14.5% and 7.9%), and throat symptoms (7.1% and 4.9%) than were other working women (2.7% eye, 2.7% nose, and 1.5% throat symptoms). FAs and teachers were twice as likely to report wheezing/whistling in the chest in the past year (20.6% and 24.9%, respectively) than other working women (10.6%). FAs were significantly more likely than teachers and referent working women to report chest illness during the prior three years (30.7%, 19.0%, 8.1%, respectively). Both groups were more likely to report five or more episodes of cold or flu in the past

year than were other working women (10.4% of FAs, 9.0% of teachers, 2.7% of referents). FAs were significantly less likely than teachers and other working women to report ever having been diagnosed with asthma (8.3%, 12.7%, 10.9%, respectively).
Conclusions. Overall, flight attendants and school teachers report a higher prevalence of respiratory symptoms compared to the general working population. Study limitations include the self-reported nature of the data and the lack of comparability in time periods among study data and referent data. The findings should be confirmed and potential causes of the apparently high prevalence of symptoms in these occupational groups should be the subject of further study.

P040 A cross-sectional study of photocopier manufacturing workers with occupational exposure to toner dust

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Background. It is suspected that exposure to photocopier toner dust causes respiratory health effects. Our recent animal experiment of 24-month exposure showed that exposure to large amount of toner dust could induce fibrotic changes in the lungs, although it did not show any carcinogenicity. To assess the relation between toner dust exposure and pulmonary disease, we started epidemiological studies of photocopier manufacturing workers in 1999. To date, we have obtained preliminary results from a cross-sectional study of 404 workers.
Methods. Four hundred and four male workers aged 20 to 59 years (mean: 35.4 years) who were engaged in toner exposure works such as toner manufacturing, photocopier test, and maintenance service, at the point of survey were recruited for this study. Two-hundred-eigthy-four male workers aged 21 to 65 years (mean: 40.4 years) were selected from the same work places as the reference group. We obtained medical and occupational histories, present respiratory symptoms, chest radiographs, pulmonary functions, and blood and urinary tests.
Results. The prevalence of current smoker was 66.8% in exposed workers and 59.1 % in control workers. The prevalence of past smoker was 9.5% and 14.2% respectively. Minimal changes were found in chest X-rays of 10 toner exposure workers and 4 control workers. However, the difference in prevalence between the two groups was not statistically significant. No other items revealed any difference between toner exposed workers and the reference group.
Conclusions. The present study did not indicate that occupational exposure to toner dust causes any respiratory effects. As we cannot exclude several biases, a cohort study should be conducted to confirm our negative findings. The results of our retrospective cohort study will be also provided at the conference.

P041 Perceived indoor air quality and respiratory symptoms in a hospital building - differences between genders and work tasks

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Background. In hospitals, poor indoor air quality may pose a health risk not only to the personnel but also to patients. Moisture damage and related microbial exposure may lead to work-related symptoms and diseases, as well as increased sickness absence and use of health care services. The objective of this study was to estimate the extent of indoor air problems in a large hospital building and the risk factors of work-related symptoms, respiratory infections and allergies among the personnel.
Material and methods. Perceived indoor air quality, work-related symptoms, respiratory infections and allergies were measured with a questionnaire in the personnel of a large hospital building (n=2267).
Results. Subjective annoyance due to insufficient ventilation, moisture damage, mould odour and other unpleasant odours and other indicators of poor indoor air quality were equally often reported by both sexes, but several irritation symptoms and non-specific symptoms were more prevalent among women than men. Respiratory infections were also more common among women than men. However, no significant differences were reported in the prevalence of allergic diseases between genders. On the contrary, asthma was slightly more often diagnosed in men than in women. Between predominantly female occupations, reporting of respiratory symptoms, infections and allergic diseases differed between nurses, cleaners and secretaries. Sickness absence and the use of health care services was more common among women than men.
Conclusions. Higher morbidity among women has also been reported in previous studies. However, in many doctor-diagnosed diseases no differences remain between sexes or men tend to have higher prevalence rates. When indoor air problems are concerned, both sexes are affected and annoyed by poor indoor air quality. Women tend to experience more symptoms and respiratory infections which in turn lead to high costs due to use of health services and sickness absence. Moisture damage abatement and improvement of indoor air quality is crucial in decreasing work-related morbidity and preventing occupational diseases in occupations where a majority of the workers are women, e.g. hospital personnel, teachers and day-care.

P042 Mortality in a Swedish porcelain industry

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Background. In the porcelain industry workers are exposed to fine particles containing crystalline silica (quartz). International studies have shown an excess risk for myocardial infarction (IHD) due to high particulate exposure. Other studies have shown an excess of lung cancer from silica exposure.
Methods. Mortality was studied in a cohort at a Swedish porcelain factory. In total 837 subjects (37% females) were followed up who had worked in the plant at least one year during 1951-1996. Silica exposure was calculated by classifying subjects into three groups: >20% of TLV, 20-100% of TLV and > TLV. The TLV for silica dust is 0.1 mg/m^3. Cumulative silica exposure for each subject was assessed. Local reference rates were used.
Results. Mortality in respiratory diseases had a significant excess (SMR=207) for males but not for females (SMR=128). Mortality from myocardial infarctions (IHD) and lung cancer was lower than expected for males but higher than expected for females (not significant). Just seven lung cancer cases were observed. The excess risk was lower for higher exposed subjects. No dose-response was found for any outcome. Females had generally higher mortality excess risk for all outcomes.
Conclusions. This study did not confirm any excess risk for IHD due to particulate exposure or lung cancer due to high exposure to silica dust. Excess was only found in respiratory diseases including silicosis. The negative dose-response can be explain by selective withdrawals.

P043 The international classification of high-resolution CT for occupational and environmental respiratory diseases: good inter-reader agreement

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Objective. We have developed a classification of HRCT for the purpose of screening and surveillance of respiratory diseases caused by occupational and environmental factors, where pneumoconiosis is a ma-

Volume 93, n. 5 Settembre - Ottobre 2002

La Medicina del Lavoro

RIVISTA BIMESTRALE DI MEDICINA DEL LAVORO E IGIENE INDUSTRIALE
ITALIAN JOURNAL OF OCCUPATIONAL HEALTH AND INDUSTRIAL HYGIENE

Sixteenth International Symposium
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Jack Pepys Symposium on Prevention of Occupational Asthma

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ABSTRACTS

The symposium was organized by
Municipal Institute of Medical Research (IMIM)
and
Pompeu Fabra University
Barcelona

Under the auspices of
Scientific Committee of Epidemiology
International Commission on Occupational Health

Guest editors
Pierluigi Cocco, Manolis Kogevinas, Jan-Paul Zock, Hans Kromhout, Kate Venables

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