No Excess Lung Cancers ...

This landmark study confirms the findings of other less extensive research which has found no excess mortality risks resulting from low-level exposures to chrysotile asbestos. For example, Churg (1986) discovered that residents of chrysotile mining communities who were exposed to fibre levels from 200 to 500 times higher than those common in most North American cities showed no evidence of a higher incidence of asbestos-related disease. Other studies examining work place exposures have corroborated these findings. Newhouse & Sullivan (1989) conducted a 40 year mortality study in a factory producing chrysotile-based friction materials. They concluded that despite exposure levels substantially higher than those currently found, chrysotile asbestos was processed with no detectable excess mortality. Similar findings have also been observed in studies of chrysotile exposure in the asbestos/cement industry (Ohlson & Hostedt, 1985;Thomas et al, 1982; Weill et al, 1979).

The Liddell, McDonald & McDonald report not only supports these previous findings, but it makes a significant new contribution to our understanding of the nature of the threshold level of exposure responsible for inducing chrysotile-related disease. In terms of its implications for industrial hygiene policy, the study provides compelling evidence that the controlled-use approach to chrysotile asbestos is not only feasible, but given that current exposure levels around the world are frequently 1 f/cc or less, it is the most logical regulatory option. ■

Previous Data on Chrysotile Exposure Support New Findings

Although the Liddell, McDonald & Mcdonald stu the largest and most thorough cohort study to a number of scientific antecedents support its conclusions.

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Churg, A. Lung. *Asbestos content in long-term residents of a chrysotile town.* American Review of Respiratory Disease, 1986, 134(1): 125-1

Study comparing health effects in residents of chrysotile mining towns, whe are from 200 to 500 times higher than in most North American cities. In higher levels, no evidence of higher asbestos-related disease was found.

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Newhouse, M.L. and Sullivan, K.R. *A mortality study of workers manufa friction materials :1941-86.* British Journal of Industrial Medicine 46(3): 176-179

The authors confirm that there was no excess mortality from lung cance asbestos-related tumours or chronic respiratory disease.

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Ohlson, C.G. and Hogstedt,C. *Lung cancer among asbestos cement wo ASwedish cohort study and review.* British Journal of Industrial Me 1985, 42(6): 397-402.

A cohort study of 1176 asbestos-cement workers in a Swedish plant using chr asbestos found no excess mortality at exposures of between 10-20 f/ml.

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Thomas, H.F., Benjamin, I.T.,Elwood, P.C. and Sweetnam, P.M.. *Further follo study of workers from an asbestos cement factory.* British Jour Industrial Medicine, 1982, 39(3): 273-276.

A follow-up study of 1,970 workers in an asbestos-cement factory using chr only showed no significant Standard Mortality Ratio (SMR) excesses. The cau death investigated included neoplasms and cancers of the lung, pleura and trointestinal tract.

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Weill,H., Hughes, J. and Waggespack, C.. *Influence of dose and fibre typ respiratory malignancy risk in asbesos cement manufacturing.* Ame Review of Respiratory Disease, 1979, 120(2): 345-354.

An investigation of 5,645 asbestos-cement manufacturing workers found increased mortality resulting from chrysotile exposures of approximately 15 years.

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" stringent regulation and frightening publicity have led to public anxiety and chemophobia... the cost of cleaning up phantom hazards will be in the hundreds of billions of dollars with minimal benefit to human health. In the meantime, real hazards are not receiving adequate attention."

P. Abelson
Associate Editor, Science

Policy considerations ...

which there are no detrimental health effects, many scientists are recommending that we rethink our approach to risk assessment. As such, legislators are asked to recognize the limitations of the linear model as a basis for regulatory policy.

Scientific Limitations of the Linear Model

There are a number of serious problems which can arise from applying the linear model of risk assessment which extrapolates from high dose exposures to much lower ones. Any of a number of experimental flaws can alter the slope of the dose-response curve and result in an inaccurate estimate of risks at the low end of the exposure scale. Experimental errors, and the effects of insufficiently large data pools or slight variations in chemical composition are magnified many times over as data from very high doses is extrapolated to very low doses. The end result is that predictions based on the linear model have resulted in gross exaggerations of the actual health risks and carcinogenicity of many substances at low levels of exposure. This has clearly been the case for asbestos. The actual number of asbestos-related cancers observed in the U.S. is more than 20 times less than the original estimates based on the linear extrapolations of Dr. Irving Selikoff and the U.S. Department of Health Education and Welfare (HEW).

Despite these and other serious limitations as well as the existence of other more realistic interpretations of the data, extrapolations from high dose exposures have frequently been used as the principal i ment for determining chrysotile exp limits and regulatory policy. The rea that once a risk estimate is calculate published, regardless of its valid accuracy, it can be used as a platfo justify unwarranted and extreme acti

All Substances are Potential Toxins

Supporters maintain that it is prud err on the side of caution. They b that although at low doses no car genic effect may be observed, it is po that these effects exist, but are u tectable with current data and metho gy. In theory, this is true. Zero risk fo substance cannot be proven with abs certainty, nor will it ever be. Clear substances are potential toxins an never be proven to be without risk. includes exposures to common and e tial substances such as salt, water or oxygen. At very high doses any subs can be carcinogenic and the risk f will always decline as the dose dec Conversely, even the most toxic subst such as arsenic are not only safe a doses, but necessary to our survival challenge for regulators, with the a tance of scientists, is to determine level of safety is acceptable. In the ca chrysotile asbestos and many other stances, the linear model of extrapola has proven ineffective. The high le uncertainty in extrapolating from doses to much lower ones is beyond which is acceptable. It has led to misi mation, unrealistic risk estimates ultimately to ill conceived and unrea regulations.

U.S. Study Links Fiberglass to Lung Disease

Does prolonged exposure to fiberglass adversely affect pulmonary functions or produce radiographic abnormalities in humans ?

A recent study by researchers at the University of Southern California (USC) School of Medicine concluded that commercial rotary spun fiberglass appears to produce human disease that is similar to asbestosis. The study, conducted by K. Kilburn, D. Powers and R.H. Warshaw was published in the October issue of *The British Journal of Industrial Medicine*. It examined 284 workers at an appliance factory where refrigerator doors and cabinets were insulated with fiberglass sheeting and loose rotary spun fiberglass.Workers with exposures of twenty years or more were evaluated on a number of tests of respiratory functioning including lung volumes, chest x-rays and physical examination.

The researchers found that in addition to eye and throat irritation in about 20% of the population studied, expiratory flows, which indicate pulmonary dysfunction, were significantly impaired. 43 workers also had evidence of pneumoconiosis on chest radiographs. The authors believe that 36 (13%) of these pulmonary opacities or plural abnormalities were due to fiberglass exposure.

A postmortem analysis of one worker who died just prior to the study showed a substantial accumulation of glass fibres in the lungs. A transmission electron microscopy examination showed that each lung contained approximately 178,000 fibres.

Charles Rossiter, former professor at the London School of Hygiene and Tropical Medicine who currently acts as a consultant to the insulation industry disputes the study's conclusions. He argues that the study does not adequately recognize the compounding effects of smoking and that the control group was not representative. Mr. Rossiter does nonetheless urge the Man Made Mineral Fibre industry to undertake further study into the health effects on users.

Jim Merchant, a leading American authority and director of the Occupational and Environmental Health Department at the University of Iowa believes that this study is " in line with what we know about fiberglass". Mr. Merchant warns that "this may have a lot of implications for people who work in building and construction." Other major American and European cohort studies of the occupational health risks for workers in the Man Made Mineral Fibre (MMMF) manufacturing sector have found lung, trachea and bronchus cancer rates in excess of those expected. ■

Sources:

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Code of Practice for Synthetic Mineral Fibres

In response to recent human and animal data, representatives from the Quebec Federation of Labour (QFL), with the support of the Canadian Labour Congress have written a draft Code of Practice for the use of Synthetic Mineral Fibres (SMF). The code would include descriptions of SMF, summaries of their health effects, as well as recommendations for proper monitoring, safe work practices and exposure limits. The code would detail work practices based on the different risk factors accorded to various fibres.

A number of recent studies (see article *U.S. Study...*) have found evidence that exposures to some types of SMFs can have serious health effects, including eye and throat irritation, pulmonary dysfunction, non-malignant disease and cancer. Despite the growing concerns of scientists, regulators and the labour movement, some industry representatives such as Frank Cereghini, manager of Occupational Health and Safety at Owens-Corning/Fiberglass Canada maintain that insulation fibres are not carcinogenic.

A new Code of Practice is intended to eliminate the inter-provincial inconsistencies which exist in worker protection policies across Canada and provide guidelines for government policy and industry practices. ■

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