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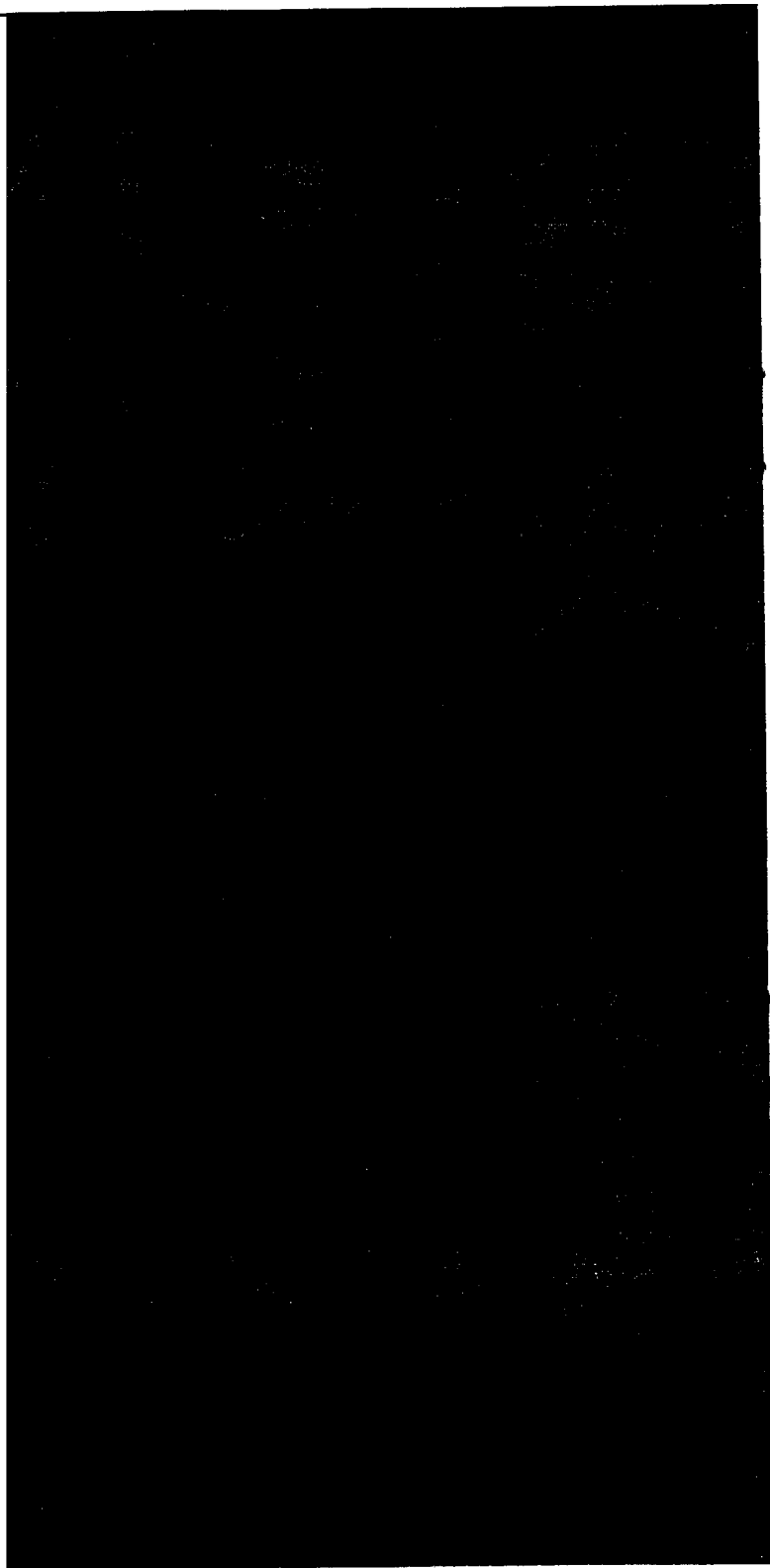
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Report of the Advisory Committee on
Asbestos Cancers to the Director of the
International Agency for Research
on Cancer

October 1972

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In October 1972 the International Agency for Research on Cancer, held an International Conference in Lyon, France, with 137 participants from 20 countries to review all the evidence relating asbestos with cancers. At the end of the conference an Advisory Committee consisting of more than thirty of the world's leading medical and other scientific experts on this subject, was appointed to prepare a report to the Agency's Director. This is divided into two sections: first, a General Review in the form of answers to a number of important general questions about the relationship of asbestos to cancers of different sites and, secondly, recommendations for further research. The conclusions of the General Review are of such importance for the asbestos industry and for an appreciation of current expert opinion that they are reproduced in full. The recommendations for further research are summarised.

General Review

1. Are all major commercial types of asbestos able to cause lung carcinoma?

Yes. Since 1964 the evidence of a causal relationship has been increased by epidemiological studies showing exposure-response relations for the incidence of lung carcinomas. The production of lung carcinomas in certain animals by all types of asbestos supports this conclusion. The epidemiological evidence in man, however, shows that there are clear differences in risk with type of fibre and nature of exposure.

2. Is there evidence of an increased risk of lung carcinoma at low levels of exposure to asbestos, such as have been encountered by the general population in urban areas?

The evidence of an exposure-response relationship based in part on past dust measurements and in part on the type of job within the industry suggests that an excess lung carcinoma risk is not detectable when

the occupational exposure has been low. These low occupational exposures have almost certainly been much greater than that to the public from general air pollution.

3. *Since 1964 has the evidence relating past exposure to asbestos and mesotheliomas changed?*

The evidence has been greatly strengthened by further prospective and retrospective mortality studies in many countries of populations exposed to asbestos. There is evidence that all commercial types of asbestos except anthophyllite may be responsible. Evidence for an important difference in risk in different occupations and with the type of asbestos has increased. The risk is greatest with crocidolite, less with amosite and apparently less with chrysotile. With amosite and chrysotile there appears to be a higher risk in manufacturing than in mining and milling. There is also evidence from population studies that a proportion of cases of mesothelioma have no known association with exposure to asbestos.

4. *Is there evidence of an increased risk of mesothelial cancers at low levels of exposure to asbestos, such as have been encountered by the general population in urban areas?*

There is evidence of an association of mesothelial tumours with air pollution in the neighbourhood of crocidolite mines and of factories using mixtures of asbestos fibre types. The evidence relates to conditions many years ago. There is evidence of no excess risk of mesotheliomas from asbestos air pollution which has existed in the neighbourhood of chrysotile and amosite mines. There are reported differences on incidence of mesothelioma between urban and rural areas, the causes of which have not been established. There is no evidence of a risk to the general public at present.

5. *Since 1964 has the evidence changed on the importance of other factors such as cigarette smoking, waxes, oils and trace elements as contributory factors to the cancer risks?*

The evidence has accumulated indicating:

- (1) Cigarette smoking is an important factor enhancing the lung carcinoma risk in asbestos-exposed workers, in both men and women. Asbestos workers have specially strong grounds for giving up smoking to protect their health. No association has been demonstrated between cigarette smoking and mesotheliomas.
- (2) Animal experiments designed thus far to test the importance of waxes and oils as contributory factors in the production of mesothelioma have shown these contaminants are unlikely to be relevant.
- (3) From animal experiments there are no good clues suggesting that trace elements are likely to be a major factor in the production of asbestos cancers.

6. *What other types of cancer are related to exposure to asbestos?*

Prospective surveys of occupational groups exposed to asbestos have in general shown a small excess risk of some other types of cancers (in addition to bronchial and mesothelial), especially those of the gastro-intestinal tract. The excess of these tumours is relatively small compared with that for bronchial cancer. Evidence for an association with ovarian tumours has not been supported by the first large mortality survey of women previously exposed to asbestos.

7. *Is there evidence of an increased risk of cancer resulting from asbestos fibres present in water, beverages, food or in the fluids used for the administration of drugs?*

Such evidence as there is does not indicate any risk.

8. *Is there evidence of a risk of lung fibrosis from low levels of exposure to asbestos such as have been encountered by the general population in urban areas?*

There is at present no evidence of lung damage by asbestos to the general public. The amount of asbestos in the lungs of members of the general public is very small, compared to those occupationally exposed. It is greatest where asbestos is mined or worked and lowest in rural areas.

9. *Has the relationship between asbestos exposure and the development of pleural plaques been established?*

Pleural plaques have been associated with past exposure to all commercial types of asbestos. But additional factors, other than asbestos itself, are involved. The plaques may remain fibrous or become calcified. Not all pleural plaques are associated with asbestos.

Recommendations for Further Research

The Advisory Committee consisted of three panels – Epidemiology, Pathology, Physics and Chemistry. Each made recommendations for further research.

Epidemiology

The Epidemiology Panel set out 13 projects for further work, of which the following were rated high in priority:

- (a) Further development of objective methods for early detection and surveillance of effects caused by asbestos.
- (b) Assessment of excess cancer risks following exposure to only one type of fibre.
- (c) Studies of the amount and type of asbestos in the lungs of cases of mesotheliomas.
- (d) Studies of secular changes in incidence of pleural and peritoneal mesotheliomas nationally and internationally.
- (e) Epidemiological studies to investigate the association between past exposure to asbestos and cancer of sites other than lung, pleura and peritoneum.
- (f) Studies to relate amount and type of asbestos in the lung and estimates of past dust exposure and interval since last exposure.

Studies (c) and (f) would require close co-operation between the Epidemiology, Pathology and Physics and Chemistry Panels.

Pathology and Experimental Pathology

This Panel set out 14 projects, some of which they rated high in priority. In the field of morbid anatomy and histology they agreed that in relation to asbestosis further consideration be given to methods for determining the amounts, types and structural features of asbestos in tissue, and that in relation to carcinoma an investigation of whether reduction of asbestos exposure to levels below those producing asbestosis also abolishes excess risk of carcinoma was important. The latter could require co-operation

with the other Panels, as would a project in the field of clinical research to investigate monitoring by immunological methods populations exposed to asbestos to ascertain whether it is possible to recognise those who are developing, or will develop, tumours. It was also agreed that information is required about the role of fine particles, especially the influence of fibre size, in the induction of tumours; these studies should be extended to include fibres other than asbestos.

Physics and Chemistry

The Physics and Chemistry Panel felt that considerable progress had been made on methods of identifying the type of fibre in tissues but a quantitative method when several types of fibres were present had yet to be developed. Among physical and chemical studies which could contribute to research on the biological effects of asbestos and other fibrous materials would be studies of the effects of fibre size and shape on the retention of material in the lungs, the site of deposition, the migration of fibres within the body and their carcinogenic or other biological activity. Projects suggested for future work covered:

- (a) the fibre samples available for experimental work;
- (b) research methods;
- (c) inhalation studies;
- (d) occupational and environmental studies of asbestos dust concentrations;
- (e) establishment of an international Physics and Chemistry Panel to review periodically requirements for materials for experimental work; provide guidance on physical and chemical problems; and arrange national and international standardisation trials.

Epidemiology Panel

Dr. M. Becklake

McGill University, Department of Epidemiology and Health, Quebec, Canada.

Dr. H. Bohlig

Chefarzt der Strahlenabteilung des Stadtischen, Ludenscheid, Germany.

Dr. N. Day	Unit of Epidemiology and Biostatistics, International Agency for Research on Cancer, Lyon, France.
Prof. P. C. Elmes	Department of Therapeutics and Pharmacology, Queen's University of Belfast, N. Ireland, UK.
Dr. J. C. Gilson	Medical Research Council, Pneumoconiosis Unit, UK (Chairman).
Dr. J. Lepoutre	Medical Department, Eternit S.A., Belgium.
Prof. J. C. McDonald	McGill University, Department of Epidemiology and Health, Quebec, Canada.
Mr. C. E. Rossiter	Medical Research Council, Pneumoconiosis Unit, UK.
Dr. H. Sakabe	Department of Industrial Physiology, Ministry of Labour, National Institute of Industrial Health, Kawasaki, Japan.
*Dr. I. J. Selikoff	Department of Medicine, Mount Sinai School of Medicine, New York, USA.
Dr. G. K. Sluis-Cremer	South African Medical Research Council, National Research Institute for Occupational Diseases, Johannesburg, S. Africa.
Dr. W. J. Smither	Cape Asbestos Co. Ltd. UK.
Dr. G. Wright	Division of Medicine, St. Luke's Hospital, Cleveland, Ohio, USA.
*Unable to attend.	

Pathology Panel

Dr. A. C. Allison	Clinical Research Centre, Harrow, Middlesex, UK.
Mr. G. Berry	Medical Research Council, Pneumoconiosis Unit, UK.
Dr. P. Bogovski	Unit of Environmental Carcinogens, International Agency for Research on Cancer, Lyon, France.
Dr. M. Kannerstein	Pathology Department, Barnert Memorial Hospital Centre, Paterson, New Jersey, USA.
Prof. W. T. E. McCaughey	School of Pathology, Trinity College, University of Dublin, Eire.
Prof. D. Magner	Canadian Tumour Reference Centre, Department of Pathology, University of Ottawa, Canada.
Prof. H. Otto	Direktor des Pathologischen Instituts der Stadt Krankenanstalten, Dortmund, W. Germany.
Dr. H. T. Planteydt	Stichting Streeklaboratorium "Zeeland", Netherlands.

Dr. M. Stanton	Department of Health, Education and Welfare, National Institute of Health, USA.
Dr. J. C. Wagner	Medical Research Council, Pneumoconiosis Unit, UK (Chairman).
Prof. S. Watanabe	Department of Pathology, National Cancer Centre, Research Institute, Tokyo, Japan.
Prof. I. Webster	Medical Research Council South Africa, National Research Institute for Occupational Diseases, Johannesburg, South Africa.

Physics and Chemistry Panel

Dr. L. Le Bouffant	Laboratoire du Centre D'Etudes et Recherches des Charbonnages de France, Creil, France.
Mr. G. W. Gibbs	McGill University, Department of Epidemiology and Health, Quebec, Canada.
Dr. S. Holmes	Asbestosis Research Council, UK.
Mr. A. Morgan	Atomic Energy Research Establishment, Health Physics and Medical Division, UK.
Dr. F. D. Pooley	Department of Mineral Exploitation, University College of S. Wales and Monmouthshire, Cardiff, UK.
Dr. S. Speil	Johns Manville Research and Engineering Centre, New Jersey, USA.
Dr. V. Timbrell	Medical Research Council, Pneumoconiosis Unit, UK.
Dr. R. du Toit	Government Mining Engineers' Division, Department of Mines, Johannesburg, South Africa.
Mr. W. H. Walton	Institute of Occupational Medicine, Edinburgh, UK. (Chairman).

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