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OBJECTIVES AND GENERAL PLAN FOR OCCUPATIONAL HEALTH STUDY OF THE ASBESTOS PRODUCTS INDUSTRY

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Division of Occupational Health

Public Health Service

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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OCCUPATIONAL HEALTH STUDY OF THE

ASBESTOS-PRODUCTS INDUSTRY

Asbestos is a generic term applied to a number of fibrous crystalline silicate minerals. Although chemically they are grouped as hydrated silicates, they vary greatly in degree of hydration, complex composition of the silicate, and physical properties of the crystalline fibrous structure.

Reference was made to asbestos as early as several centuries B.C. It was not established as a mineral of industrial importance, however, until around the end of the last century. Because of outstanding properties of chemical resistance, fibrous structure and incombustibility, asbestos has a wide variety of uses in modern industrial technology. It is used in the manufacture of textiles, felts, ropes, brake linings, roofing and flooring materials, asbestos-cement products, gaskets, insulation materials, special papers, filters and plastic products. These find use in practically every major industry.

Information from the Bureau of Mines' Minerals Yearbook, Volume I, 1958, shows an apparent consumption of around 685,000 short tons of asbestos in this country in 1958 in the manufacture of asbestos products. Chrysotile accounted for around 642,000 tons, crocidolite 26,000 tons, and amosite 17,000 tons. The consumption of other types of asbestos in this Country appears negligible. Of the above tonnage, this Country produced around 41,000 tons of chrysotile, the remainder of the chrysotile coming predominantly from Canada. The crocidolite was imported mainly from Bolivia, Australia and the Union of South Africa.

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The amosite came from the Union of South Africa. During the period 1953–1958, the consumption of crocidolite increased from 8,000 to 26,000 short tons. Its major use is in the manufacture of asbestos-cement pipe. The consumption of amosite during the same period increased from around 15,000 to 17,000 short tons. The major use of amosite is in the manufacture of asbestos insulating material.

Very meager information is available on the number of workers in this Country with primary exposure to asbestos and its products. It is estimated that under 10,000 workers have primary exposure to asbestos in the manufacture of asbestos products. When the consumers of the asbestos products are included, this number will probably increase at least twenty to thirty fold.

Asbestos workers have been the subject of numerous studies and review articles since asbestosis was first recognized as an occupational disease in the late 1920's; however, many questions remain unanswered concerning the clinical aspects of the disease and its etiology. Information on the prevalence and clinical characteristics of asbestosis has been derived primarily from medical studies of actively employed asbestos workers. These have been supplemented by special clinical studies and autopsy data. Little definitive data regarding the nature and magnitude of concurrent environmental exposures have been obtained. Studies of this type do not include workers who have left the industry. Further, these studies have been limited in scope, including only a small segment of the asbestos industry. Asbestos miners and asbestos textile workers have received the most attention.

Concurrent with the interest in the pneumoconiosis problem, an increasing number of investigators reported the occurrence of respiratory tract

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malignancy associated with asbestosis. The published data in this regard are based largely on mortality statistics and autopsy records of former employees in asbestos industries. While some of the reports strongly suggest that lung cancer is an occupational hazard of asbestos workers, the literature in this respect is by no means unanimous and the data are often conflicting.

Several factors may account for this apparent discrepancy in the technical literature. Diagnostic criteria for asbestosis are often poorly defined, making valid comparisons of studies difficult, if not impossible. Conclusions are too frequently applied to a broad classification encompassing all asbestos workers and are not confined to the group under investigation. Information on such factors as sex, community air pollution, personal smoking habits and family history of cancer are absent in the majority of reports. Environmental data are scanty. No clear attempt is made to define exposures to different asbestiform minerals or associated materials. Mortality studies often encompass a broad multi-exposure group and do not relate to a specific and single exposure. Despite the accumulated knowledge, the following questions remain unanswered:

1. What is the prevalence of pneumoconiosis in asbestos workers actively employed in the asbestos-products industry?
2. What is the significance of exposure to different sources and forms of asbestos and to other materials commonly employed in this industry in the development of pneumoconiosis?
3. What is the role of non-occupational respiratory disease in the development of the pneumoconiosis?
4. Are malignancies occupational risks of the asbestos worker in the asbestos-products industry? If so, what are the important etiological factors?

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5. What other diseases, if any, may be associated with exposure to asbestos or other materials commonly used in the asbestos products industry?

6. What are safe levels of exposures to the various materials in this industry that constitute health risks?

To secure answers for these questions, the Division of Occupational Health proposes a comprehensive study of the asbestos products industries in the United States. The objectives of this study are:

1. To determine the health status of the asbestos workers in this industry with special attention to diseases of the respiratory tract.

2. To determine which environmental factors have an adverse effect upon the health of asbestos workers in the asbestos-products industry.

3. To determine the relationship between occupational exposure and cause of death of asbestos workers.

4. To develop medical and environmental criteria and procedures for the control of health risks identified by the studies.

General Plan of Study

A. Record Studies

Information on the past and present significance of the asbestos problem and its magnitude can be obtained through an analysis of mortality and morbidity data relating to asbestos-exposed workers. These studies will include workers who have left the industry during the last 25 years, those presently exposed, and those who will be leaving the industry, all on a continuing basis.

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B. Laboratory Studies

Laboratory research is necessary to develop sampling and appraisal techniques which will permit a detailed definition of asbestos dust exposures. In addition, animal studies are needed to evaluate any relationship between asbestos fiber exposure and tumor formation.

C. In-plant Environmental Studies

The environmental studies will be designed to define the working environment of the various plants. Particular emphasis will be placed on levels and nature of exposures to asbestos dust. Exposures to other air contaminants -- silica and mineral dusts, fumes, mists, vapors and gases - which may be associated with asbestos or its processing also will be carefully assessed.

D. In-plant Medical Studies

The medical studies will be designed to develop specific information relative to the effects of asbestos dust and other associated exposures on health. They will include medical examinations of a substantial portion of the asbestos-workers in the asbestos-products industry and provide a sufficient background for periodic follow-up medical surveys. The medical findings will be related to the various aspects of the environmental exposures.

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