May 21, 1956.

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Memorandum on

PROPOSED EPIDEMIOLOGICAL STUDY OF LUNG CANCER IN ASBESTOS WORKERS

for the

ASBESTOS TEXTILE INSTITUTE

INTRODUCTION

The rapidly increasing incidence of cancer of the lung has become a matter of concern to investigators in all branches of health as well as to the general public. Although it would appear to be inevitable that some cases would develop in any group of workers, its occurrence in persons who also had asbestosis has been specifically noted by a number of authors over the past twenty years. (Lynch and Smith, Angrist, Desmeules et al, Cartier, Gloyne, Morewether, Konnaway and Kennaway, Doll, and others.) Hueper, of the National Cancer Institute, U.S. Public Health Service, has stated that cases of lung cancer superimposed upon asbestosis now number about 100. Like many of the above authors, Hueper refers to "asbestosis cancer" of the lung and claims a definite relationship between the two conditions. Although most of the attempts at correlation

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have been limited to lung cancer and asbestosis, a connection with mere exposure to asbestos fiber and dust has been inferred. Therefore, it now appears that when lung cancer occurs in an asbestos worker, it may be looked upon as an occupational disease by some Workmen's Compensation Boards.

Because of these considerations and motivated by a desire to determine the true facts, the Asbestos Textile Institute, through its Air Hygiene Committee, approached Industrial Hygiene Foundation regarding the feasibility of a statistical and epidemiological study having as its objective to prove or disprove, if possible,

1. Whether there is a relationship between lung cancer and asbestosis, and

2. Whether a relationship exists between lung cancer and any considerable exposure to asbestos fiber and dust.

The representatives of the Air Hygiene Committee pointed out that only two to three thousand employees were engaged in textile production and because of this relatively small number, it was felt that a preliminary survey should be undertaken to find the extent and reliability of data before stating definitely that the larger study would be practical and productive.

RESULTS OF PRELIMINARY SURVEY

During the weeks of April 23 and May 7, 1956, visits were made to seven member plants of the Asbestos Textile Institute and conferences were held with representatives of management at each. In some cases, there was also an opportunity to meet the physician for the plant. The purpose was to determine the extent and availability of medical records and employment records, and the period of time covered by them. Total employment as well as the number of those engaged in textile manufacturing was ascertained and attention was given to the relative exposure of employees in different operations. At the same time, inquiry was made regarding life insurance records which might be useful in fixing the causes of deaths among the employed group. Each plant was questioned regarding the number of known cases of asbestosis and of lung cancer, if any. It can be assumed without investigation that official sources of vital statistics as they apply to the general population exist in all of the locations with which we are concerned.

As a result of this preliminary survey, it is apparent that considerable information is available or obtainable with respect to the textile workers and to others with potential exposure. For example,

1. Pre-employment records exist at all plants, in most for a considerable number of years.

2. Periodic x-rays of the chest are made at all but one plant.

CRMC-Motley1000-Subj-000799

3. Records of employment can be studied for periods varying from six to 56 years.

4. All the plants except one have a group life insurance program which would provide data on causes of death.

5. Autopsy protocols are available on at least a limited number of lung cancer cases.

It would seem that at least 1800 textile workers have been employed under observable conditions for periods sufficiently long to give a total of no less than 15,000 person-years. From a statistical point of view, this should be an adequate basis on which to predict with 90% accuracy, providing the plant incidence is actually higher than that in the general population. In addition, this study would be considerably enhanced by virtue of the fact that comparable information will be at hand from a similar study to be made for the asbestos mining industry. Results from the latter will provide extremely valuable confirmatory evidence for deductions drawn from the present material.

PROPOSAL

Careful consideration of the type and probable reliability of available data permits the conclusion that a study of this problem in the asbestos textile industry is feasible, and should result in statistically valid deductions.

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ACL Doc 13028 · Page 4 of 6 asbestosclaims.law/library/13028/4

Several methods of approach suggested themselves, and a final choice of method should depend upon more detailed study of the data which the preliminary survey has shown to exist. In general, however, it is suggested that as large as possible a group or "cohort" of workers who entered the industry at a specific time be selected and followed, through the use of existing records. The incidence of asbestosis in this group should be determined by studying the results of the periodic examinations, and incidence of lung cancer through records of the insurance carriers and official vital statistics. This method would approach the conditions of a controlled experiment and the information derived would be of great importance.

Following this, a comparison of the rates found in this group of workers and the incidence in the general population would be made. Experience for segments of the general population (selected so as to eliminate biases and control variables) would be obtained from study of official vital statistics records and from published reports regarding incidence of cancer of the lung. It is, of course, necessary to place considerable reliance upon death certificates regarding the diagnosis, but in most borderline cases it should be possible to refine the data by more extensive search. It would be helpful, also, if the group under study could be enlarged by the inclusion of workers who are exposed to asbestos fiber and dust even though they are not employed in the textile departments. It is our understanding that in some of the companies

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ACL Doc 13028 · Page 5 of 6 asbestosclaims.law/library/13028/5

employees have exposure in other areas, and a study of the records of workers in such areas would increase the validity of the study.

This type of survey obviously necessitates detailed analysis of the work history, medical records, and insurance company experience as they relate to all workers presently employed, as well as those no longer employed but whose records are available. It will also require examination of insurance company records in all death claims with follow-up in each case in which cancer is a possible cause. In addition, it will be necessary to study vital statistics records for the areas in which the various plants are located. The incidence of lung cancer, although increasing rapidly, is still comparatively low, and for this reason, there is no substitute for the type of approach outlined if meaningful results are to be obtained.

It is anticipated that the field work for such a study would consume approximately six months, and analysis of the data, any necessary review, and preparation of the report, an additional six months. On this basis, cost of the study is estimated at $17,500, including travel and out-of-pocket expenses.

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