

Limiting the investigation to cases coming to autopsy, as has been frequently done in earlier studies, still further restricts its use in generalization. The problem with which we are concerned is whether asbestos miners experience more lung cancer than does the general population. The answer necessitates the collection of reliable information on asbestos miners as a group, as well as on the general population.

It seems advisable to discuss the differences between the epidemiological approach and that used in the studies which have been reported to date. A very important consideration is the fact that lung cancer, in spite of its increasing numbers, is still a disease of low incidence; that is, in a given population not many persons will contract this particular disease. This fact requires that large samples or groups must be studied to provide meaningful results.

Recognizing the difficulty of obtaining such large samples, most earlier writers deviated from the epidemiological method and sought to circumvent the requirement of observing well persons by (1) comparing the relative frequency of cancer in various sites; (2) comparing the relative frequency of cancer in a group of hospitalized patients; (3) comparing the relative frequency of cancer in a group of cases coming to autopsy.

Attempting to compare two population groups, looking only at the relative frequency of cancer in various body sites, may result in finding a higher percentage (relative frequency) in one of the groups, when, in fact, the mortality rate of cancer of a particular organ is exactly the same in both groups. This is very clearly demonstrated in the excellent article by Dorn.²⁰ The mortality rate from a particular cause is the true measure of comparison.

It is apparent that selected groups such as hospitalized patients or autopsy cases may not be in any way representative of a larger group, and that in dealing with such samples, the observer may easily find more cases of a given disease than would

be found in another group of the same size, but representative of the general population. It is true that investigation of cases from such a sample can furnish information valuable for research, but the use of this information in drawing generalizations is necessarily restricted. It is the obligation of both the investigator and of those who read his report to make proper comparisons and to draw only those conclusions which are valid and justified. A good statistical study of cases of cancer of the lung occurring in a group of autopsies can lead to a proper inference concerning the frequency of lung cancer among cases coming to autopsy, but only to such cases. For information from such a study to be projected to some larger group, it is necessary that the autopsies represent a good sample of that larger group. To assume that such is the case in any particular series is dangerous and likely to be false.

There is some danger that the figures reported by some authors may be misconstrued as applying to asbestos workers or even asbestos miners, when, in fact, the authors in question do not make this generalization, nor can the generalization be made for the reasons stated. Close study of the reports reveals that the percentages cited relate only to the group of autopsies covered by the particular investigation.

The present study, in contrast to the earlier works, has been planned to utilize the epidemiological method. A well-defined group of asbestos miners has been established in such a way that it constitutes a good sample of the whole population of asbestos miners in Quebec. Data for all members of this group have been collected and analyzed. Those concerning lung cancer have received most careful consideration. Details of the methods employed will be set forth later, but the type of approach is considered to permit of fair comparisons and valid generalizations.

Collection and Analysis of Data

A preliminary survey of potential sources of information in February, 1956, involved

discussions with of the asbestos with clinicians, of City and Provincial of the Canadian other interested morbidity data, as were available from hospitals in Montreal the 13 cancer deaths. However, mortality in lung cancer to depend upon These we found vital statistics department of Health in Quebec preliminary survey, it five and detailed gathered with records employed in the and the mortality population.

Following this initial effort was of data relating to been processed the forced Mines since similar information at Asbestos, Quebec records included personal medical history number of years of weighted exposure the individual's history of his death.

From this information to formulate a "cohort" defined, should be whole group, and a definite period of time experience indicates of asbestosis in less exposure must be so, singly, the cohort was every miner who had five or more years, employment rolls in nonexposed persons of employment, we