

death certificate it was not mentioned, may have been missed. The import of this 16% is enhanced by the simultaneous statement that the incidence of lung cancer in autopsies of the general population is only 1%. The danger of attempting to compare a rate found in 344 cases with the rate for the general population without respect to age, occupation, and many other variables, such as smoking habits, is obvious.

Lynch,⁷⁰ who with Smith⁶⁸ had reported the first case in 1935, reported 4 cases of carcinoma of the lung in a series of 49 autopsies on workers in an asbestos manufacturing plant who were shown to have "demonstrable deposits of asbestos in the lungs." This, of course, is not necessarily identical with the disease asbestosis. Lynch, himself, points out that, although this is an incidence of 8.2%, "both figures are too small for very serious statistical types of calculation." Nevertheless, later writers have used this paper to strengthen the case for an association of carcinoma of the lung with asbestosis. It is also of interest that Klotz⁶³ found only the same number of cases of lung cancer in a series nearly 10 times as large, i. e., 4 in 478 cases of asbestosis.

Behrens, as cited by Merewether,⁷⁶ estimated that, of 309 cases of asbestosis in the literature, 44 showed associated cancer of the lung—giving an incidence of 14.2%. This is an illustration of generalizing an incidence obtained in a group of cases which were undoubtedly reported only *because* some of them showed lung cancer, to possibly hundreds of asbestotics whose cases were never reported. The same applies to the conclusion of Teleky,⁸⁵ who appears to have reviewed reports of 39 autopsies on persons with asbestosis among which 6 cases of lung cancer occurred. Information from sources such as these does not justify generalizations with regard to mortality rates.

Perhaps no one has written so extensively on the subject as has Hueper.⁵²⁻⁵⁹ In 1955 he reviewed the cases⁵⁸ reported

prior to that date and enumerated a total of 99. Eleven of these were those discussed by Doll²⁸ and may have been cases covered by other authors. Eight were discovered by Kennaway and Kennaway⁶² in an analysis of death certificates, and, unless Merewether's study was incomplete, these cases should have been included in his report. Of the remaining 80, it is quite possible that the 31 contributed by Merewether and the 17 by Gloyne contain some duplication with each other or with those of other English authors.

Principles of the Epidemiological Method

Dorn³⁰ has pointed out that much of what is now thought to be pertinent concerning the comparative frequency of lung cancer in different population groups has been developed from the analysis of clinical material, particularly surgical and autopsy records, supplemented to some extent by the reported impressions of various clinicians based upon their personal observations. More recently, however, attention has turned to the systematic investigation of this problem by the same methods that have proved so successful previously in the study of communicable diseases, that is to say, by epidemiological methods.

In order to apply this method of investigation to the problem under discussion, we were of the opinion that a study should be planned so as to provide (1) a well-defined population group; (2) available data for all members of this population, including the healthy as well as the ill; (3) a sample which is truly representative of the population; (4) reliable and valid observations relating to the problem of the study.

A serious defect, common to most of the studies which have been reported, is that little or no information concerning the healthy people in the group seems to have been available to the author. In order to draw a generalization regarding all asbestos workers, it is necessary for a study to include living persons as well as the dead.