

FILE NAME: New York State & NY Times (NY)

DATE: 1952

DOC#: NY002

DOCUMENT DESCRIPTION: Journal Article - The Program of the NY State Occupational Cancer Committee

Mayers

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VOLUME 5
1952

PUBLISHERS
AMERICAN MEDICAL ASSOCIATION
CHICAGO 10, ILL.

THE PROGRAM OF THE NEW YORK STATE OCCUPATIONAL CANCER COMMITTEE

MAY R. MAYERS, M.D.
NEW YORK

THE NEW YORK State Occupational Cancer Committee was organized in 1947 as an outgrowth of a conference called by the Division of Industrial Hygiene and Safety Standards for the purpose of reviewing, with a group of experts, the prevention of bladder cancer and the effectiveness of existing control measures in two aniline-dye plants in New York State. The discussion of how to control certain known carcinogenic hazards in industry very naturally led to a consideration of other occupational causes of cancer, of the fact that there might very well be in the industrial environment carcinogens which are not even suspected at the present time, and how one would go about finding them.

There was so much interest on the part of those present that the New York State Occupational Cancer Committee was formally organized to study these problems. Its membership was as follows:

May R. Mayers, M.D., chairman, Division of Industrial Hygiene and Safety Standards, New York State Department of Labor, New York.

Austin V. Deibert,¹ M.D., Cancer Control Branch, National Cancer Institute, Bethesda, Md.

Konrad Dobriner, M.D., Sloan-Kettering Institute for Cancer Research, New York.

Harold F. Dorn, Ph.D., Biometrics Section, National Cancer Institute, Bethesda, Md.

G. H. Gehrmann, M.D., Manufacturing Chemists Association, Wilmington, Del. (represented by Dr. Allen J. Fleming).

Paul R. Gerhardt, M.D., Division of Cancer Control, New York State Department of Health, Albany, N. Y.

Hyman Goldstein,² Ph.D., Division of Cancer Control, New York State Department of Health, Albany, N. Y.

Leonard Greenburg, M.D., Division of Industrial Hygiene and Safety Standards, New York State Department of Labor, New York.

Arthur E. Hoag, M.D., Socony-Vacuum Oil Company, Inc., New York.

LeRoy S. House, M.D., Tumor Clinic Association, New York State.

W. C. Hueper, M.D., Cancer Control Branch, United States Public Health Service, Bethesda, Md.

Louis C. Kress, M.D., Roswell Park Memorial Institute, Buffalo.

Anthony J. Lanza, M.D., Institute of Industrial Medicine, New York University-Bellevue Medical Centre, New York.

Morton L. Levin, M.D., New York State Department of Health, Albany, N. Y.

George T. Pack, M.D., Medical Society of the State of New York.

Address presented at a meeting of the Cancer Prevention Committee in New York on Dec. 3, 1951.

Dr. Mayers is Chief of the Medical Unit, Division of Industrial Hygiene and Safety Standards, New York State Department of Labor, and Chairman of the New York State Occupational Cancer Committee.

1. Dr. Deibert is now with the Economic Cooperation Association, Washington, D. C.

2. Mr. Goldstein is now with the National Institute of Mental Health, Washington, D. C.

The first activity of the Committee (and its most concrete accomplishment to date) was the preparation and distribution of an educational publication, entitled "Occupational Cancer: A Challenge to the Physician." In this, an effort was made to capture the interest of the medical profession; to stress the importance of an occupational history; to provide the practicing physician with concrete data as to occupational carcinogens, either known or suspected, together with the precancerous lesions associated therewith, and to stimulate more complete and more accurate reporting of cancer deaths. This publication, sponsored by the Medical Society of the State of New York, the New York State Department of Health, and the New York State Department of Labor, was distributed to every physician in the state. It has since been reprinted by the Committee and continues to have a wide on-request distribution. It has also been reprinted in various medical journals.³

At this point, the National Cancer Institute, already represented on the Committee, provided the necessary funds for a pilot study of occupational causes of cancer. A two-year study was originally contemplated. However, the grant has since been extended for a third and last year, which is soon to expire.

Preliminary to the formulation of a definite program, the Committee gave long and careful thought to the complexities of the industrial environment and particularly to the many problems involved in any effort to discover unsuspected carcinogenic agents that might be present therein. Certain basic considerations, such as the following, largely determined the type of study which was finally agreed upon:

1. The striking increase in the incidence of cancer—particularly, lung cancer—has apparently coincided with advances in technological research and development in this country, and causal relation must be considered a possibility.

2. The increasing complexity of the industrial environment has exposed workers to an ever-increasing number and variety of physical and chemical agents—particularly to chemical contaminants of the air in the workroom, in the form of noxious dusts, gases, fumes, vapors, mists, and the like.

3. The multiplicity of abnormal environmental factors to which any individual worker may be exposed in the course of a long working life is further complicated by his great mobility (i. e., he is apt to drift from one industry to another) and by the fact that the principle of synergism may assume an important role, particularly when the worker has been simultaneously exposed to more than a single toxic agent.

4. Individual chemical and physical agents in the industrial environment are not necessarily or even usually pathognomonic for particular industries or occupations. They may be found widely distributed among many totally unrelated types of work. Common denominators of "exposure" in industry as a whole, therefore, assume great significance.

5. Conversely, a particular job classification does not necessarily provide precise information as to the nature of the occupational exposure. To say a worker is a "foundryman," for example, means little for this purpose. It makes a great difference whether he is a molder who handles dry sand; whether he pours molten metal containing lead or other toxic materials; whether he is a sandblaster, or operates a crane.

6. Accurate and complete occupational histories of patients are difficult to obtain because of the technical complexities of the materials handled and the failure of patients to present the whole story. Even a well-informed chemist who contracts an occupational disease in his labora-

3. The New York State Occupational Cancer Committee Presents a Program on Occupational Cancer, *Compens. Med.* 3:9 (Sept.-Nov.) 1950; Occupational Cancer: A Challenge to the Physician, *Month. Rev.*, New York State Dept. of Labor 30:37 (Oct.) and 44 (Nov.) 1951.

of the grant-in-aid approaches, approximately 4,500 patients have been interviewed and about 750 noncancer controls have been obtained.

As the interviews were completed, they were forwarded each week to the Division of Industrial Hygiene and Safety Standards, where, with the assistance of two industrial-hygiene chemists, under the direction of the Committee's chairman, each occupation given by each patient was carefully evaluated from an industrial hygiene viewpoint. Supplementary data were appended to each patient's record, indicating the abnormal environmental exposures known to specialists in the field of industrial hygiene as being commonly associated with each job. This work has now been completed.

The patients' completed records have been forwarded to Dr. Gerhardt, director of the Division of Cancer Control, New York State Department of Health. Under his direction, these data are now being coded and put on punch cards to be run through I. B. M. machines. Statistical analysis of the data is still in progress.

What this study will ultimately contribute in the way of extending present knowledge of the occupational causes of cancer is for the future to decide. There was no thought to get definitive data at this time but, rather, to get leads for more intensive study later on. Within the more limited canvass provided by such leads, it is hoped, field investigations—including chemical air analyses and dust counts, when necessary—will provide more detailed information with reference not only to suspected carcinogenic agents in the occupational environment but also to duration and intensity of exposures in relation to the development of occupational cancer.

The industrial hygiene slant which has characterized the study in New York State has resulted in the development of a considerable volume of data—never before collected—with reference to specific physical and chemical agents to which cancer patients had been exposed in the course of their work. The large number of variables thus introduced has, however, created very real problems for the statisticians. But, these variables are the very essence of the industrial environment which is under investigation, and ultimately they will have to be taken into account.

Perhaps, with so many variables, one requires a far larger series of cases than the 4,500 which have become available as a result of the present study. Perhaps, complex data of this type will never serve too well the mass-statistical approach; what may be required is a purely medical evaluation by an astute clinician. Doctors of industrial hygiene, for example, are accustomed to dealing with large numbers of variables per patient in connection with all field studies. Here, analogous data on the occupational environment are collected, and to these are added data derived from occupational and clinical histories, physical examinations, and laboratory and x-ray findings. The number of workers usually included in these studies is rarely large enough for mass-statistical analysis. But clinical analysis has made fundamental contributions to industrial toxicology and has provided a basis for the establishment of accepted safe standards for purposes of prevention (so-called maximum allowable concentrations). The independent experience now being developed in the pilot studies which are in progress in the several states may provide an answer.

New York State was the first to embark on such a study and the first to receive a grant for this purpose from the National Cancer Institute. Its situation differs from that of the other states in that its study is being carried out by a distinguished

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committee, with representatives of various state and federal agencies among the participants. Elsewhere, these studies are being conducted as State Health Department projects.

It is already becoming evident that each of the pilot studies now in progress has its own serious limitations and that all are unexpectedly time-consuming and expensive. Perhaps, the ultimate approach will be found in starting *now* to collect currently and compile accurate occupational data for analysis 15 or 20 years hence, utilizing such social-security records as unemployment insurance, placement, workmen's compensation, sickness insurance, and the like. The "forms" now being used by social-security agencies and other groups could be so modified as to provide a vast fund of information for the future, as to the successive environmental exposures of persons in whom cancer ultimately develops. However, whether this vision of future benefits will be sufficiently inspiring to overcome natural resistance to undertaking additional work in the present carries a big question mark.

ABSTRACT OF DISCUSSION

DR. EMERSON DAY, New York: Has your group made any effort to contact officials of industries to verify exposures reported by the patients interviewed?

DR. MAYERS: In the beginning the Committee planned to check each patient's occupational history by field visits and even by air analyses and dust counts to get data as to exposure in terms of dosage. It was soon discovered, however, that this was not practicable. Plants had gone out of business or were found to be operating so differently since the patient worked there as to make the investigation useless. It is hoped that this approach may be utilized when the study is extended to follow up specific leads which may be developed.

PROF. E. V. COWDRY, St. Louis: Do your records comprise a considerable variety of industries or do they tend to be restricted to those industries that happen to be located in the Buffalo area?

DR. MAYERS: We have encountered a very wide range of occupations. However, we discovered that the hospital selected draws most of its patients primarily from Up-State New York, which is largely agricultural, but also has most of our large chemical industries.

DR. LESLIE BEARD, New York: Have you any data on cancer in urban as compared with rural populations?

DR. MAYERS: Information as to residence was an item in the questionnaire and has been coded. Data on this point should come out of the analysis.

DR. EMERSON DAY, New York: I notice that there are several hundred different items in your list of exposures. Do you feel that you have obtained enough histories to provide a significant concentration of data for any particular item or group of items?

DR. MAYERS: The large variety of exposures involved in this study is one of the difficulties which worry our statisticians. These many variables are essential characteristics of the industrial environment and will have to be met ultimately in one way or another.