



Evolution of Occupational Health Programs in State and Local Governments

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BORN and revitalized by crises, governmental occupational health units have contributed basic knowledge on the identification and control of occupational diseases, spurred the development of preventive health programs in commerce and industry, trained leading authorities in the field, and sired other public health programs such as air pollution and radiological health.

Yet despite the growing importance of the central concern of these agencies—health problems associated with work—their vigor has failed to match the demonstrated need for their basic services. A brief review of the manner in which State and local occupational health programs have evolved will show some of the factors that shaped their rise and fall and may illuminate this enigma.

Toll of Occupational Diseases

As the United States surged ahead into the Industrial Age at the turn of the century, the appalling working conditions, with utter disregard of health, life, and limb, were generally accepted as assumed risks of the job. In 1898 the U.S. Supreme Court made the first broad statement that the health of the laborer as a producer is considered to be as much a public benefit as the health of the consumer and that the protection of labor becomes a public purpose. This pronouncement, however, was not to become a reality for some years.

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As the century turned, an awakening social consciousness, expressed through State and Federal governments, gradually brought about protective legislation to reduce, first, the toll of crippling and maiming traumatic injuries and, much later, the disabling diseases of occupation. The first evidence of public concern appeared in Massachusetts, a State in the forefront of early progressive legislation.

In 1905 the Massachusetts State Board of Health became the first known State agency to employ health inspectors to investigate the dangers of occupation. Although this function was short lived, terminating in 1910, it provided sufficient basis for the issuance of the first American report, documented with 90 photographs, of deleterious health conditions in factories. Kober and Hayhurst (1), lauding the contribution of the board and its farsighted concern with the total environment of the worker, remarked: "The pioneer work and methods pursued by the State Board of Health of Massachusetts have been of inestimable value not only to that commonwealth but also to the country at large. The same agency which investigated the dangers of occupation was seeking also to control the evils which arise in the home and community life of the worker." The seeds of industrial hygiene as a State public health function were sown.

The first State agency to formally organize a division of industrial hygiene was the New York State Department of Labor in 1913. The department, however, employed its first medical inspectors of factories in 1907, and in 1911 it established a laboratory in connection with a hospital clinic "for the purpose of determining

the causes of occupational or industrial poisonings and diseases and minimizing or preventing the same" (2). The division was established at the recommendation of the New York State Factory Investigations Commission.

Several commissions of this type had been established during these years for the study and prevention of occupational accidents and diseases and to determine the need for workmen's compensation. Although 21 States had enacted laws by 1909 attempting to regulate working conditions in industry—some of which contained general provisions on ventilation, dust control, and sanitation of workshops—enforcement lagged. Untrained inspectors, usually political appointees, failed to recognize even the more obvious accident hazards. The ineffectiveness of these laws and inspection systems stimulated investigations by officials and civic groups into the health status of workers.

One of the better known surveys was conducted by Dr. Alice Hamilton (3) as a member of a commission appointed by the Governor of Illinois. Reporting on her work and that of other investigators in this country, Dr. Hamilton revealed that 3,500 cases of lead poisoning had occurred in American industry between 1908 and 1914. Such findings of large numbers of industrial poisonings, coupled with the high accident rates in industry, spurred governmental agencies and legislatures to take more protective measures.

Among the many developments of this early decade was the passage of the "lead laws" in 1913-14 in New Jersey, Ohio, and Pennsylvania. Regulatory and enforcement powers were vested in labor departments, but the laws also recognized the role of health departments by making open to them records of physical examinations of exposed workers and by requiring that reports of poisonings be filed with them as well as with labor agencies. These laws not only represented first attempts at preventive legislation for an occupational disease but they probably gave origin as well to the splitting of functions in industrial health between health and labor agencies that was to continue over the years.

Following enactment of a workmen's compensation law in 1913, the Ohio State Legislature ordered the State board of health to make

an investigation and study of occupational diseases. As part of a statewide survey of 1,067 industrial establishments, the board uncovered a total of 864 occupational disease cases of "positive character" for the 19 months ending November 30, 1914 (4, 5). Of these, 544 cases were of lead poisoning. These findings led to the appropriation of funds by the State legislature in 1915 for the State board of health to continue its investigations and research into causes of occupational diseases. The experience gained by further research provided the basis for selecting a schedule of 15 occupational diseases that were made compensable in 1921 under the State workmen's compensation law.

By 1913 about half (23) of the States had enacted workmen's compensation laws, but coverage of occupational diseases was the exception until after the depression years of the early 1930's. While compensation legislation stimulated the initiation of a few State programs in industrial hygiene, it served more to move reluctant industry to improve its working conditions.

World War I gave impetus to industrial hygiene as a technology but not as a State governmental function. Large outbreaks of occupational diseases continued to occur, but governmental agencies seemed preoccupied with compensation rather than prevention. Almost 15 years were to elapse before the creation of the third official State program in industrial hygiene. It was not until 1928 that a bureau of occupational health was organized in Connecticut, following authorization of the State health department, to investigate and make recommendations for the elimination or prevention of occupational diseases.

The occurrence of occupational diseases continued to influence the development of official programs into the mid-1930's. An evaluation of the problem in Pennsylvania was attempted in 1934, when the department of labor and industries, through the Civil Works Administration program, employed nurses to gather information on occupational illnesses and chemists to take and analyze air samples in selected industries. Because of limited funds, this function, with the same director, was transferred in 1936 to the State department of health. Data accumulated on occupational dis-

eases formed the basis of a report for considering compensation coverage of occupational diseases.

For the most part during this period, attention was focused on silicosis because of the tremendous onslaught of claims for compensation, stimulated largely by the depression (6). This mounting problem led to the creation of three official divisions of industrial hygiene: A division of occupational hygiene was established in the Massachusetts State Department of Labor and Industry in 1935 as the result of the State Industrial Disease Commission's report on silicosis in granite industries and foundries. In North Carolina funds were turned over to the State board of health in 1935 by the industrial commission for a dust control program in industry. In West Virginia funds were transferred by the workmen's compensation commissioner to the State department of health in 1936 for studies of the silicosis hazard in connection with the administration of the silicosis compensation law.

Grant-in-Aid Funds

Development of programs, however, continued to limp along until the passage of the Social Security Act in 1935 made funds available for the expansion of public health programs, including industrial hygiene. The stimulus of grant-in-aid money gave a tremendous boost to this activity, and the Public Health Service Division of Industrial Hygiene, in cooperation with the Conference of State and Provincial Health Authorities of North America, exercised vigorous leadership in promoting the initiation of State and local programs. Subsequent growth was rapid and continuous.

The years 1936-39 were the formative years for industrial hygiene as a State and local governmental function, and the 30 units established by 1939 were to eventually create a nucleus of manpower in industrial hygiene. The immediate task of these newly formed units was to provide medical and engineering service for the control and prevention of occupational diseases. Through preliminary industrial hygiene surveys—a technique which still has useful application today—many of the States undertook to determine the nature and extent of such problems in industry. These surveys, together

with the field studies conducted by the Public Health Service in cooperation with the new units, not only contributed much valuable data but also provided unparalleled training opportunities for personnel. This was the era of what is now regarded as "traditional industrial hygiene."

The maturing of these fledgling units was hastened by the country's participation in national defense activities and eventual entrance into World War II. The emergency also gave great impetus to the growth of industrial hygiene as a science and a governmental function. By forcefully bringing to light the importance of conserving manpower so that production might be accelerated and maintained, the war period firmly established industrial hygiene as a public health function.

By 1945 the number of jurisdictional units engaged in industrial hygiene rose to 47 in 38 States. Although the era was auspicious for the development of these units, they were beset by various operational problems. Chief among these was the shortage of personnel caused by military priority on manpower. The Public Health Service partially compensated for this loss by lending personnel to the States to keep the units functioning. The loss was especially serious among physicians and continues to be felt today.

Further stimulus to the development of State and local units was provided from 1947 to 1950 when \$1 million of Federal grants-in-aid for public health were designated for industrial hygiene and allocated on a proportionate formula basis to each of the States and territories. The designation of funds came at a strategic time. The 70 Public Health Service personnel on loan in the State and local industrial hygiene agencies during the war years were being withdrawn, and financial support was needed to permit the recruitment of personnel already trained in industrial hygiene and being released from the Armed Forces. During the 3 years that these funds were available, the development of official industrial hygiene agencies reached an all-time high, and all but two States (Delaware and Nevada) engaged in industrial hygiene work on at least a limited basis. The number of professional personnel reached 425, also an all-time high.

Changing Health Patterns

The subsequent discontinuance of earmarked funds and general decreases in State appropriations resulted in a retrogression in occupational health activity in the early 1950's, reflected not only in the loss of personnel but also in the discontinuance of several programs. Part of this decline was also due to the low salary scales then prevailing in government agencies and part to the absorption of State personnel by industry, the armed services, and other agencies that were beginning to employ industrial hygienists at a rapid rate. Fortunately, all programs were not affected to the same degree or the setback would have been more severe.

With serious occupational diseases seemingly on the wane, State and local industrial hygiene units took on the challenges created by the national concern with air pollution and the effects of the atomic age. The industrial hygiene agencies were logical choices to assume these additional responsibilities because of their basic expertise.

Typical of movement in this direction, a full-scale program in air pollution control was undertaken by the Pennsylvania Division of Industrial Hygiene in 1949 when the State general assembly authorized funds for the study of the problem. In several other States, including Maryland, New Jersey, and West Virginia, funds appropriated by State legislatures for study of air pollution helped to stabilize the financial situations of the industrial hygiene agencies. Some States even set up their own mobile units to facilitate their air pollution studies.

With the tremendous expansion of the industrial uses of radiation, greater attention was also directed to this area. Industrial hygienists underwent training courses offered in the early years by the Public Health Service Division of Occupational Health. They purchased equipment; conducted studies on the use of X-ray machines and radioactive materials in industry, offices, and the community; and worked on the preparation of rules and regulations. An outstanding accomplishment of the 1950's was the banning of fluoroscopic shoe-fitting machines as a result of their work. Public understanding of the potential health effects of radiation often

served as a justification for the health officer to continue support of his occupational health personnel when other appeals for funds failed.

About the same time, public attention was focused on the health hazards associated with the increased use of agricultural chemicals, particularly the organic phosphates. Several States, including California and Florida, where the problem was paramount, concentrated efforts in this field.

The active promotion and provision of health services for State or local government employees by several occupational health units proved to be another popular function that had the support of the health officer.

During the early part of the fifth decade, while governmental units were struggling for existence, industrial hygiene was being widely accepted by management, labor, and other groups as a full-bred science. However, "industrial hygiene," the term itself, was being replaced by "occupational health," with its broader connotations. After 1951, when the Division of Industrial Hygiene of the Public Health Service became the Division of Occupational Health, similar changes in State designations and concepts have been common.

As a further indication of program emphasis, the Maryland unit in 1951 became the division of industrial hygiene and air pollution. Oklahoma and South Dakota in 1956 were the first States to designate their units as occupational and radiological health units.

Current Status

Nine States still have no identifiable programs in occupational health. A total of 81 occupational health units function in 41 States and Puerto Rico and in 36 local health departments. Three of the State programs (New York, Massachusetts, Illinois) are in departments of labor. In California, Ohio, and Puerto Rico, programs varying in size operate in both health and labor departments or industrial commissions. The remaining 72 units are in State or local health departments.

The total of 681 professional personnel employed by these units is an increase of almost 200 persons since 1959. The rapid increase in staff can be attributed almost entirely to the

employment of personnel for radiological health work and, to a lesser extent, for air pollution control activities. Not included in these totals are personnel on loan status from the Public Health Service. However, the figures do include 29 physicians, nurses, and technicians on staffs for governmental employee health services administered directly by four State and local occupational health units.

The composition of State and local staffs remains mainly environmental, accounting for 80 percent of the total professional staffs. This has not changed in the past 15 to 20 years. Medical and nursing personnel have at one time made up as much as one-third of the staff; the proportion at present is 12 percent. Personnel employed for providing employee health services account for 4 percent.

Although there is a tendency for setting up separate radiological health and air pollution programs in the States, there are still some 33 State units that have either total or shared responsibilities in one or both of these areas. In the larger, well-staffed units, this fractionization of duties has not detracted from the occupational health phase. In the more numerous, smaller units, however, time devoted to other duties has slashed seriously into the occupational health program, frequently limiting it to services on a request basis only.

Current staffs of industrial hygiene agencies are totally inadequate to cope with a fast-growing industrial labor force. The average number of nonagricultural employees per each occupational health staff member ranges from a low of 23,400 in Vermont to a high of 724,000 in Illinois. The average per staff for all units is 108,200 workers, an impossibly large number in view of the concentration of most workers in small plants employing less than 100 workers.

During the 1940's, State and local units were reaching about 10 percent of the labor force in the country with industrial hygiene services. Today's coverage is substantially less since at least 20 units carry on only minimal activity or confine their services to requests for assistance.

Occupational health as an activity of local health departments has grown at a snail's pace. The one exception is California, where the State bureau of occupational health actively assists

local health departments in starting such services. States fail to encourage local involvement, and local health departments are loath to take on additional functions with currently pressed staffs. Since 1936, when the Baltimore, Detroit, and St. Louis health departments started industrial hygiene programs, the number of local units has grown to 36 in 16 States. Almost half (17) of these units are in California. Several large cities, including New York, New Orleans, and Miami, have no formal programs in occupational health. It was only within the last year that the Chicago Board of Health employed a medical consultant to develop an occupational health program for that city.

State and local programs continue to vary in scope, depending on size of staff, administration, and industrial economy. The best developed phases of programs deal with engineering services. Emphasis in other programs is dependent on State conditions.

What Lies Ahead?

The need to strengthen occupational health units in the States is as strong as ever and becomes more critical each year as the work environment becomes more complex, subjecting the worker to even more potential physiological and psychological stresses and strains. Constant changes and improvement of production methods often introduce new hazards as they may remove the old ones. New problems appear with new industries and accelerated industrial diversification. As more sophisticated techniques become available for assessing more subtle, long-term effects of job exposures on health, new areas of possible relations of occupation to the occurrence and aggravation of chronic and other degenerative diseases open up.

Although the dramatic challenge of our space age may be keenly sensed by the occupational health administrator, he will find it no easy task to communicate this need to those on whom he depends for support. Even in the grimmest precontrol days when occupational diseases were shockingly rampant, the public hue and cry was in no way commensurate with the magnitude of the problem. For instance, just 30 years ago Gauley Bridge disaster headlines reported hundreds of fatalities from silicosis

and more than a thousand disabling cases of the disease (6). Whatever impact this tragedy had on the public, it alone did not lead to any appreciable activity by State governments to establish industrial hygiene services. As was noted, it remained for the stimulus of special grant-in-aid funds to begin to build the necessary network of units to apply the knowledge that had been developed over the years.

The occupational health program administrator must place new emphasis on and direct his personal attention and effort to effective communication with his various publics. He has the responsibility not only of helping his agency to keep technically abreast of new developments and to enlarge its competence but also to communicate this knowledge more efficiently. By so doing he can help assure both a greater application of occupational health practices and the support necessary to continue his activity at a reasonably adequate level.

In this effort he should recognize and act on the opportunity presented by an era acutely conscious of the total environment and its health implications. Industrial hygiene has been the template of knowledge in the development of not only our own specialized field of occupational health but also those of air pollution and

radiological health. Further offshoots from our parent science may be expected as new environmental problems unfold. By prominently identifying his relationship to the total environmental problem, the occupational health administrator can closely align himself with valuable allies concerned with achieving a true unity of environment and at the same time serve in greater measure his specialized segment of that environment.

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Silicosis in Metal Miners

Silicosis, a disease of the lungs caused by inhalation of certain mineral dusts and thought to be on the decline for many years, still endangers the health of some American metal miners. This clinical finding was reported by a study group from the Division of Occupational Health, Public Health Service, and the Bureau of Mines, Department of the Interior, after examining conditions and miners in the metal mining industry in the United States for the past 3 years.

Improvement of dust control in the mines for the past 25 years has markedly reduced the danger of silicosis, according to the study, but finding 128 cases among men exposed since 1935 indicates that dust has not been controlled effectively in all mines even in later years. The heaviest prevalence of the disease, 298

cases, was found in miners who began working before 1935. With combined medical and engineering surveillance and control, the report states, the development of clinically significant silicosis among miners can be prevented.

This major environmental and clinical study was the most extensive ever undertaken in U.S. metal mines. More than 14,000 miners were examined and 19,000 dust samples collected at 67 mines. The 250-page report issued, "Silicosis in the Metal Mining Industry: A Reevaluation, 1958-1961," includes recommendations for effective dust control methods and medical precautions to protect workers from silicosis. The publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402, for \$1.25.