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Pneumoconiosis Mortality in Pennsylvania

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Pneumoconiosis is a disease to be reckoned with; the mortality figures are high and are not dropping. This paper shows the disease to be important as a primary cause of death, but also emphasizes its secondary role.

THIS report is a continuation in time of the article which appeared in the JOURNAL in August, 1960, and described pneumoconiosis mortality for the period from March 1, 1957, to Feb. 28, 1959, in Pennsylvania. The present paper depicts mortality for the period from Jan. 1, 1959, through Dec. 31, 1960.

Mortality figures for occupational diseases of the chest continue high and there has been no startling change. The cost of occupational disease compensation for the illness has risen from $21,000,000 for the 1957-1959 biennium to $23,350,000 for the 1959-1961 biennium. These payments are made under the Pennsylvania Occupational Disease Act of 1939 which provides for procedures that are separate and distinct from the Workmen's Compensation Act in connection with cases of silicosis, anthracosilicosis, and asbestosis. This act was amended in 1953 and further provides that "in those cases where disability or death is not conclusively proved to be the result of the last occupational exposure, all compensation shall be paid by the Commonwealth."

Since occupational pneumoconiosis is a chronic disease and most workmen do not stay on the same job throughout their working lives, most of the claims are paid in full by the Commonwealth rather than by an insurance carrier or the industry responsible for the dust hazard. The State assumed 100 per cent financial responsibility for 92 per cent of the claims paid during 1959 and 1960, and shared responsibility with employers in the remaining cases.

The first steps of the preventive program proposed in the 1960 paper have been initiated and over 16,000 coal miners have been x-rayed and studied in central and western Pennsylvania. Part of the findings have been reported elsewhere. The Department of Mines and Mineral Industries is conducting a vigorous dust control program throughout bituminous and anthracite mines in Pennsylvania and has accomplished the correction of many dust hazards. Results of these accomplishments will not show up for several years since pneumoconiosis is a slowly progressive and cumulative condition.

According to the most recent figures compiled by the National Vital Statistics Division of the National Center for Health Statistics, 55.3 per cent of the pneumoconiosis mortality in the United States occurs in Pennsylvania. Approximately 93.8 per cent of all deaths from anthracosilicosis are reported from Pennsylvania (Table I).

The number of Pennsylvanians dying annually with occupational lung disease as the underlying cause of death has increased since 1950 as shown in Table II.

It is also of interest to note that since 1950 the number of deaths attributed to tuberculosis complicated by occupational lung disease (code number 001 of the International Statistical Classification of Diseases, WHO) has remained fairly constant (1950, 152 deaths; 1954, 116; 1955, 135; 1956, 148; 1957, 144; 1958, 144; 1959, 139; and 1960, 138), although mortality from all forms of tuberculosis during the same period has been reduced 63.5 per cent (2474 deaths in 1950 to 902 deaths in 1960).

When the age of decedents is examined, it is found that occupational lung disease is the eighth most frequent cause of death among males aged 65 years and older, and is 1.3 per cent of the total male mortality in this age group for the year 1960. Among males aged 45 to 64 years, pneumoconiosis is the seventh most frequent underlying cause and is 1.8 per cent of the total male mortality in this age group. Less than 1 per cent of the males dying from this disease were under 45 years of age.

From the Division of Occupational Health, Pennsylvania Department of Health.

In the five Pennsylvania counties where most of the occupational lung disease is concentrated, mortality from this cause among males over 44 years of age is far more frequent. Pneumoconiosis is the second most frequent cause of death in Luzerne and Schuylkill counties, exceeded in frequency only by heart disease. These lung diseases ranked fourth in frequency as cause of death among males in this age group in Carbon, Lackawanna, and Northumberland counties, being exceeded only by heart disease, cancer, and vascular lesions affecting the central nervous system.

The figures indicated in the foregoing do not tell the whole story since they are based only on tabulation of the primary causes of death. An examination of 240,273 death certificates filed during the two-year period Jan. 1, 1959, through Dec. 31, 1960, was made to determine how frequently pneumoconiosis was reported as a complication or contributory cause in addition to the number of times this condition was indicated to be the primary cause of death. During the period there were 2772 male deaths reported with mention of occupational lung disease in the certification of cause of death. Sixty-two and seven-tenths per cent of these reports (1739) stated that the occupational lung disease was the primary cause of death, while for the other 1033 deaths pneumoconiosis was specified to be an associated morbid condition existing at the time of death.

The 2772 deaths involving pneumoconiosis were 2.1 per cent of the 133,939 males who died from all causes during the two-year period. In 11 of the 67 counties in Pennsylvania the proportion of males dying with pneumoconiosis exceeded 2.1 per cent. Of the total deaths involving pneumoconiosis in the State, 81.7 per cent occurred in these same 11 counties, and 76.3 per cent of the total were concentrated in five counties (Luzerne, Schuylkill, Lackawanna, Carbon, and Northumberland). Fig. 1 indicates the 11 counties in which the proportion of male mortality involving pneumoconiosis exceeded 2.1 per cent. These counties include eight hard coal and two bituminous coal producing areas.

The underlying causes of death for the 1033 men where occupational lung disease was indicated to be only an associated morbid condition are shown in Table III. The distribution of these causes is quite different from that found for male decedents over 44 years of age in the State as a

TABLE I

MORTALITY FROM OCCUPATIONAL PNEUMOCONIOSIS IN UNITED STATES AND PENNSYLVANIA (1959)

Underlying Cause of Death	*Code* *	*Number of Deaths*		
		U.S.	*Pennsylvania*	*Per Cent* †
Silicosis	523.0	541	67	12.4
Anthracosilicosis	523.1	743	697	93.8
Asbestosis	523.2	18	6	33.3
Pneumoconiosis	523.4	179	60	33.5
Other specified (unqualified) Pneumoconiosis (not due to silica)	524.0	60	22	36.7
Total		1541	852	55.3

* International Statistical Classification of Diseases, Injuries, and Causes of Death, WHO, 1955 Revision.

† Pennsylvania/U.S. x 100.

SOURCE: For all tables, United States data from National Office of Vital Statistics, HEW, and Pennsylvania data from Pennsylvania Department of Health.

TABLE II

NUMBER OF DEATHS FROM PNEUMOCONIOSIS IN PENNSYLVANIA, 1950, 1954-1960

Year	*Number of Deaths*
1960	887
1959	852
1958	793
1957	795
1956	740
1955	695
1954	627
1950	728

(Figures for 1951-53 not available)

TABLE III

PRIMARY CAUSES OF DEATH REPORTED ON CERTIFICATES MENTIONING PNEUMOCONIOSIS AS AN ASSOCIATED MORBID CONDITION IN PENNSYLVANIA JAN. 1, 1959, TO DEC. 31, 1960

Primary Cause of Death	*Number of Deaths*	*Per Cent of Total*
All causes	1033	100.0
Heart disease	509	49.1
Malignant neoplasms	155	15.1
Pneumonia and influenza	74	7.2
Vascular lesions of central nervous system	68	6.6
Pulmonary edema	30	2.9
Pulmonary insufficiency	15	1.4
General arteriosclerosis	12	1.2
Anthracosilicosis*	9	0.9
Pulmonary emphysema	5	0.5
Tuberculosis	3	0.3
Lung hemorrhage	3	0.3
Bronchitis	1	0.1
Pulmonary fibrosis	1	0.1
All other causes	148	14.3

* As reported on death certificate

whole. For example, in Pennsylvania 1.1 per cent of the deaths of males who are 45 years of age or older are attributed to tuberculosis, whereas in this group of males known to have had an occupational lung condition at the time of death only 0.3 per cent died from tuberculosis. About 2.8 per cent of the males dying in this age group in Pennsylvania are victims of pneumonia and influenza, while in the pneumoconiosis group 7.2 per cent of the deaths are attributed to these causes. The proportion dying from cancer in the pneumoconiosis group is slightly lower than the over-all cancer death rate in the State (15.1 versus 16.5 per cent).

The three most frequent causes of death for males in this broad age group (heart disease, cancer, and vascular lesions affecting the central nervous system) generally account for at least 74.3 per cent of the total deaths. In the group with associated occupational lung disease, these three causes claim only 70.9 per cent of the total because of the number of deaths from pneumonia and influenza and from other chronic respiratory diseases.

When the occupations which are reported on this group of death certificates were examined, it was found that 1655 or 59.7 per cent of the total indicated work which may be associated with an inhalant hazard. Occupations which were reported are shown in Table IV. Since the occupation entered on the death certificate is usually the latest employment of the decedent, it is very possible that those reported as retired or as farmers and hotel workers may have been miners, steel workers, and brickyard workers earlier in their lives. It is possible that the railroad workers had worked in the railway yard foundry, and the laborers could be exposed to many different inhalant hazards.

TABLE IV

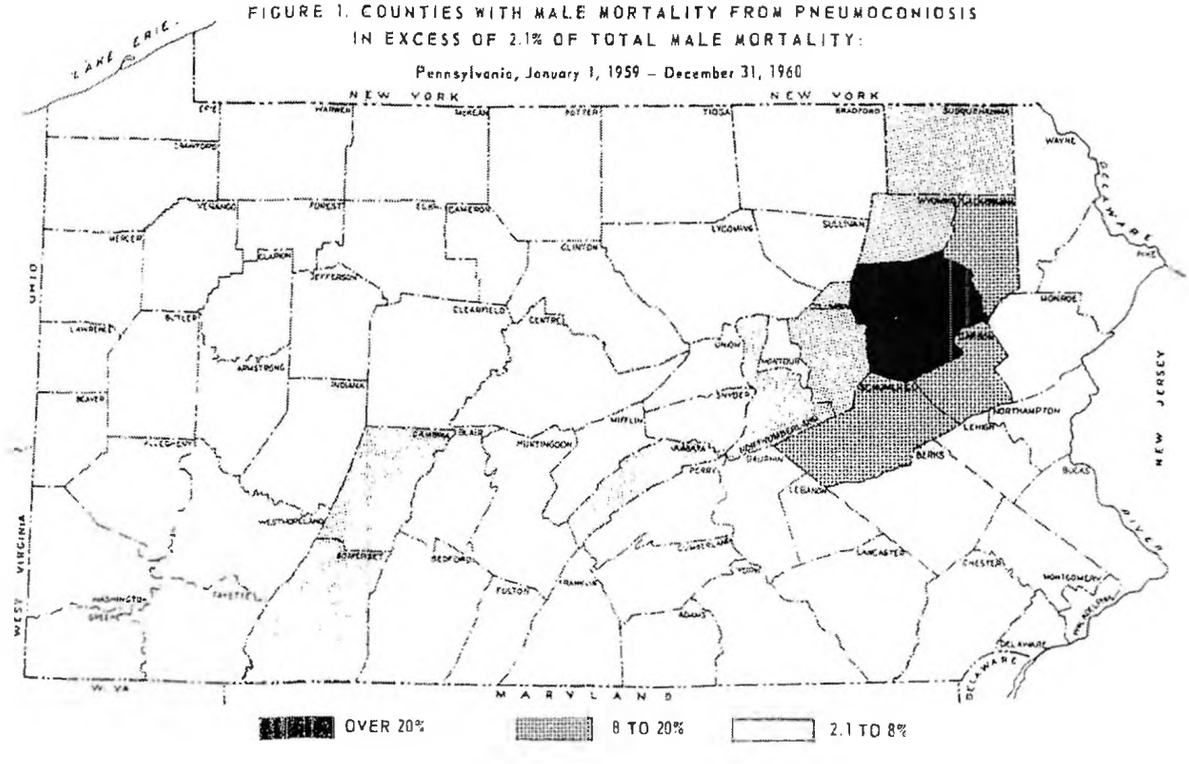
OCCUPATIONS REPORTED ON DEATH CERTIFICATES FILED FOR MALES DYING WITH SOME MENTION OF OCCUPATIONAL LUNG DISEASE IN PENNSYLVANIA JAN. 1, 1959, TO DEC. 31, 1960

Occupation	*Number of Deaths*
All occupations	2772
Mine worker	1591
Laborer	215
Railroad worker	31
Steel mill worker	31
Carpenter	29
Farmer	29
Bricklayer	11
Machinist	10
Stone worker	7
Blacksmith	5
Other, specified	399
Retired and unspecified	414

Summary

1. Mortality statistics indicate that the number of deaths in Pennsylvania from pneumoconiosis (primarily anthracosilicosis) has increased since

FIGURE 1. COUNTIES WITH MALE MORTALITY FROM PNEUMOCONIOSIS IN EXCESS OF 2.1% OF TOTAL MALE MORTALITY:
Pennsylvania, January 1, 1959 – December 31, 1960



1950, even though coal mining operations in the State have been curtailed and there are fewer mines in operation.

2. Occupational lung disease is the seventh most frequent cause of death among Pennsylvania males aged 45 to 64 years, and is ranked eighth among males who are over 64 years of age.

3. In Luzerne and Schuylkill counties pneumoconiosis is the second most frequent cause of death among males over 44 years of age, and in Carbon, Lackawanna, and Northumberland counties this disease is the fourth most frequent cause in that sex and age group.

4. When death certificates filed during a two-year period were examined, it was found that 1033 records indicated occupational lung disease to be a morbid condition existing at the time of death (but not the primary cause) in addition to 1739 certificates which stated pneumoconiosis to be the underlying cause of death.

5. The total of 2772 deaths involving occupational lung disease was 2.1 per cent of the 133,939 males who died during the same two-year period, and 81.7 per cent of these deaths were reported from 11 counties that comprise the larger part of Pennsylvania's coal mining areas.

6. Where pneumoconiosis was a morbid condition mentioned on the death certificate but not the primary cause, it was found that the primary causes were distributed differently in frequency than causes of death in the general population of males over 44 years of age. There was a distinctly higher than average death rate attributed to pneumonia, influenza, and other respiratory diseases.

7. Fifty-nine per cent of the occupations indicated on the death certificates of persons dying from or with pneumoconiosis could be associated with an inhalant hazard.

World Experts View Thalidomide

The tragedy of thalidomide, the drug responsible for the birth of thousands of malformed children, could not have been avoided.

Such was the consensus of physicians from the world over, gathered at the 10th International Congress of Pediatrics in Lisbon, Portugal.

Most participants agreed that the tragedy was unavoidable because the thalidomide case was without precedent. It was not possible, even if the most thorough experimentation on animals had been carried out, to predict the effect which the synthetic drug turned out to have on the human embryo.

Unpredictable as it was, the phocomelia "epidemic" could nevertheless have been limited, according to several physicians at the congress. Among them was Widukind Lenz, M.D., professor of human genetics at Hamburg University, who first showed that thalidomide could be a teratogenic agent.

The thalidomide catastrophe revealed how poor the existing warning system was, Dr. Lenz told congress participants. He had revealed the teratogenicity of thalidomide early last November. "It took ten days to alert Germany to its dangers, mainly through the lay press, which turned out to be the most efficient warning system," he recalled.

Ten days was long enough, but elsewhere it took even longer, Dr. Lenz added. Health authorities of most countries reacted with surprising slowness. In at least five countries, according to Dr. Lenz, thalidomide was actually not efficiently withdrawn from the market before March this year, even though evidence against the drug as a teratogenic agent was stronger than that against German measles.

Sidney Q. Cohlan, M.D., of New York, chairman of a round-table discussion on teratogenic agents, noted that as a result of the thalidomide panic the public has been clamoring for legislation that would require thorough animal testing of a drug before it is administered to human patients. But, he asked, how much can the most thorough animal tests predict?

If we are to ban all drugs which are teratogenic to animals, irrespective of dosage, answered Dr. Cohlan, "we would have to discontinue the use in pregnancy of penicillin, streptomycin, tetracycline, nicotine, caffeine—to name only a few."

As a matter of fact, one could conclude from animal experimentation that aspirin is more dangerous than thalidomide, he commented.

Six times the maximum permissible dose of salicylates produces serious malformations in rat fetuses. In contrast, administration of 75 times a comparable thalidomide dose to pregnant rabbits produces only minor fetal defects.

According to Dr. Cohlan, at least thalidomide may awaken medicine to the possibility of similar dangers elsewhere. Up to now, he pointed out, there has been little interest in the possible teratogenic effects of drugs or other agents, and only three years ago was the World Teratology Society founded under the presidency of Josef Warkany, M.D., of Cincinnati. Even now the society has only 150 members—mostly anatomists, embryologists, and geneticists—including only 12 pediatricians and three obstetricians.—Reprinted from *Medical World News*.