Lung Cancer and Mesothelioma During Prospective Surveillance of 1249 Asbestos Insulation Workers, 1963-1974*

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INTRODUCTION

In 1963, it was found that a large group of asbestos insulation workers in the New York metropolitan area had experienced unusual mortality during 1943-1962.[1] Six hundred and thirty-two men had been on the union's rolls on January 1, 1943. By December 31, 1962, 262 men had died, nine before reaching 20 years on the job. Of those who died after 20 years from first employment, lung cancer was found in marked excess; 6.02 such deaths had been expected, and 42 occurred. In addition, there were several deaths due to pleural or peritoneal mesothelioma and a modest increase in deaths due to, gastrointestinal cancer, where 9.71 were expected and 29 were observed. There were 12 deaths due to pulmonary asbestosis (TABLE 1).

TABLE 1

EXPECTED AND OBSERVED DEATHS AMONG 632 ASBESTOS INSULATION WORKERS, NEW YORK-NEW JERSEY, 20 OR MORE YEARS AFTER ONSET OF WORK, JANUARY 1, 1943 TO DECEMBER 31, 1962

	Expected *	Observed
Total deaths, all causes	196.16	253
Total cancer, all sites	31.44	95
Lung cancer	6.02	42
Pleural mesothelioma	1	3
Peritoneal mesothelioma	1	1
Cancer of stomach, colon, rectum	9.71	29
All other cancers	15.71	20
Asbestosis	1	12
All other causes	164.72	146

* Nine men died before reaching 20 years from first employment. Expected deaths are based upon white male age-specific death rate data of the U.S. National Office of Vital Statistics from 1949 to 1962. Rates were extrapolated for 1943-1948 from rates for 1949-1955.

†Rates are not available, but these diseases are rare causes of death in the general population.

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It had previously been established that lung cancer was a formidable hazard of asbestos factory workers[2] and that termination of employment did not abort the risk: apparently, once sufficient exposure had occurred with continued retention of asbestos within the lung, risk remained. This factor was of considerable concern, because a significant number of men were known to have worked as asbestos insulation workers in the New York metropolitan area, and many were still in the trade. In addition to the 370 survivors of the original 1943 cohort, 890 men had joined the insulation union † during the period 1943-1962, and 879 of them were alive on January l, 1963. Together, the two groups constituted a total of 1249 men who were either working regularly as asbestos insulation workers in 1963 or who had been recorded as having worked regularly at this trade for shorter or longer periods in previous years.

TABLE 2

MEMBERS OF ASBESTOS WORKERS' UNION ON JULY 1, 1963, ADMITTED TO THE UNION BEFORE DECEMBER 31, 1942. CLASSIFICATION BY AGE AND SMOKING HABITS ON OR ABOUT JANUARY 1, 1963

					Current Cigarette Smokers *			
Age (yr)	Total No.	Never smoked Regularly	Pipe, Cigar Only	Ex-cigarette Smokers*	1-9/Day	10-19/Day	20-39/Day	40+/Day
35-39	2	1	---	1	-----	----	-----	-----
40-44	13	2	---	2	-----	----	5	4
45-49	32	2	1	5	-----	----	12	12
50-54	109	12	6	26	3	5	33	24
55-59	60	6	5	16	-----	3	20	10
60-64	42	7	4	15	1	----	11	4
65-69	49	6	8	17	-----	4	9	5
70-74	38	7	7	12	1	4	4	3
75-79	21	3	7	6	-----	1	3	1
80-84	4	2	1	1	-----	----	----	----
Total	370	48	39	101	5	17	97	63

*Includes cigarette smokers who also smoked pipes or cigars.

Before 1963, there had been no regular surveillance of these asbestos workers, because they were not aware of their special risk. It was considered that potential benefit might be obtained if a program of regular medical surveillance could be initiated, with special focus on the principal risks that had been identified, namely, bronchogenic carcinoma, pleural and peritoneal meso- thelioma, gastrointestinal cancer, and asbestosis. Of these risks, lung cancer took first place. In addition to the risk associated with asbestos exposure, a majority of the men had been regular cigarette smokers (TABLE 2). Such history, even in the absence of asbestos exposure, carried a lung cancer risk of its own..[3] (It was later to be learned that the combination of the two factors, asbestos exposure and cigarette smoking, resulted in many more lung cancers than would be assumed from mere summation of the two effects, with asbestos exposure sharply increasing the lung cancer risk of cigarette smoking.[4, 5])

† International Association of Heat and Frost Insulators and Asbestos Workers, AFL-CIO, CLC, Locals 12 and 32.