

LUNG CANCER IN ASBESTOS MINERS

"proved" instances of lung cancer. On the other hand, they cannot, in fairness, be disregarded completely. It is for this reason that mortality rates have been calculated both ways.

Table 8 gives the rates by age groups.

The rates by length of employment are shown in Table 9. During the first 40 years of employment, the rate rises, an observation which seems plausible since the men were growing older. However, after 40 years of exposure there are no "proved" cases reported for a total of 240 men during the six years, or about 1440 man-years of exposure. When the "suspected" cases are added, one case does show up in this

TABLE 8.—Lung Cancer Deaths by Age Groups

Number of Persons and Number of Lung Cancer Deaths			
Age Group	No. of Persons	No. of Deaths	
		Proved	Total
20-44.....	3,901	1	1
45-64.....	1,124	1	1
65-84.....	615	3	3
85+.....	315	4	4
Unknown.....	3	0	0
Totals.....	5,958	9	12

Annual Lung Cancer Death Rates per 100,000 Man-Years of Exposure

Age group	Proved	Total
20-44.....	4	4
45-64.....	15	44
65-84.....	81	81
85+.....	212	265
Unknown.....	0	0
Over-all.....	25	34

period. This would produce a rate of 69 per 100,000, again demonstrating the importance of these questionable, but unproved, cases to the final conclusion, because, if there were no cases in this number of men with long exposure, and if asbestos is a carcinogenic agent, it must be concluded that these 240 men have demonstrated considerable resistance. This is a biological phenomenon which has been observed previously and is consistent with the theory of an intrinsic or endogenous factor in cancer. The only other explanation would be that the susceptible members of this age group had died earlier of lung cancer. Table 18, which appears later in this section, in-

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TABLE 9.—Lung Cancer Deaths by Length of Employment

Number of Persons and Number of Lung Cancer Deaths			
Length of Employment	No. of Persons	No. of Deaths	
		Proved	Total
5-9.....	1,795	0	0
10-19.....	2,398	1	1
20-29.....	922	3	3
30-39.....	603	5	7
40-49.....	185	0	1
50+.....	55	0	0
Totals.....	5,958	9	12

Annual Lung Cancer Death Rates per 100,000 Man-Years of Exposure

Length of Employment	Proved	Total
5-9.....	0	0
10-19.....	7	7
20-29.....	54	54
30-39.....	138	193
40-49.....	0	90
50+.....	0	0
Over-all.....	25	34

indicates that the members of the cohort *did not* die from lung cancer at a younger age than the general population.

The rates by weighted exposure are shown in Table 10, and it will be noted that they present strong evidence against asbestos being a carcinogenic agent, for, if exposure to asbestos is in any way connected to lung cancer, we would expect that the longer and heavier the exposure, the higher the rate that would be found. The only possible error in this interpretation could occur if the weighted exposures were inversely related to years of employment,

TABLE 10.—Lung Cancer Deaths by Exposure Category

Number of Persons and Number of Lung Cancer Deaths			
Exposure Category	No. of Persons	No. of Deaths	
		Proved	Total
I.....	2,031	4	4
II.....	2,150	3	4
III.....	1,772	2	4
Unknown.....	5	0	0
Totals.....	5,958	9	12

Annual Lung Cancer Death Rates per 100,000 Man-Years of Exposure

Exposure Category	Proved	Total
I.....	33	33
II.....	23	31
III.....	19	37
Unknown.....	0	0
Over-all.....	25	34