

PATTERN OF MALIGNANT MESOTHELIOMA INCIDENCE AND OCCUPATIONAL EXPOSURE TO ASBESTOS IN WESTERN AUSTRALIA

Introduction: Western Australia has one of the highest rates of malignant mesothelioma (MM) in the world¹. Early cases of MM were predominantly due to the crocidolite mining operations at Wittenoom^{1,2,3}. During the 1950s, Australia had the highest per capita asbestos consumption in the world² mostly used to manufacture asbestos cement and there was an increasing number of MM cases in workers using these asbestos products. Production declined rapidly in the 1980s and all production and importation was prohibited on 31st December 2003.

Aim: To describe the pattern of MM incidence in relation to occupational exposure to asbestos in WA.

Methods: All incident cases of MM are recorded in the WA Cancer Registry and are reviewed by an expert committee (pathologist, respiratory physician, occupational physician, epidemiologist, and Cancer Registrar) to verify the diagnosis. All available exposure information including medical (many taken for workers' compensation purposes) and employment records is examined to determine the most significant occupational exposure responsible for the disease. The number of cases for each occupational group was expressed as a proportion of all cases in each decade of occurrence of disease.

Results: There were 1,263 confirmed cases between 1962 and 2009 (97% males) who had had occupational exposure to asbestos and a further 75 (53% male) where exposure could not be identified (table 1). The total number of cases in each decade increased from 57 in the 1960s and 1970s combined, to 211 in the 1980s, 475 in the 1990s and 595 in the 2000s. The proportions of cases resulting from crocidolite production and transport together with rail workers and plumbers were highest in the 1960s and 1970s. The proportions associated with asbestos exposure in waterside workers, the armed forces, ladders and insulators, shipbuilding, asbestos cement production, automotive brake work and non-asbestos mining peaked in the 1990s and the proportions in building and construction, electricians, boilermakers/welders and power station workers were greatest in the 2000s. Overall the largest proportions of cases came from construction and Wittenoom workers. The proportion of cases with no identifiable exposure is less than previously reported⁴ and has not changed significantly.

Conclusion: The numbers and proportions of MM cases attributed to occupational asbestos exposure in WA reflect the patterns of asbestos use in the various occupations more than 30 years ago. Since 1980 there has been an increasing proportion of MM cases from non-occupational exposures to asbestos⁵, but occupational exposures clearly remain the main cause and appear likely to do so for many years. Despite the exponential rise in the risk of MM following exposure to asbestos, the decline in the working population at risk and removal of asbestos from construction and industrial equipment suggest that the MM epidemic in WA will be finite.

References

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Table 1. Numbers and percentages of malignant mesothelioma cases per occupational group over five decades in Western Australia

Occupational group	1960-1979		1980-1989		1990-1999		2000-2009		TOTAL	
	N	% ^a	N	%	N	%	N	%	N	%
Wittenoom workers	31	54.4%	70	33.2%	83	17.5%	82	13.8%	266	19.9%
Rail workers	8	14.0%	14	6.6%	36	7.6%	51	8.6%	109	8.2%
Plumbers	2	3.5%	6	2.8%	14	2.9%	20	3.4%	42	3.1%
Asbestos transport	2	3.5%	6	2.8%	12	2.5%	8	1.3%	28	2.1%
Non-ABA Wittenoom ^b	0	0.0%	10	5.1%	9	1.9%	12	2.0%	31	2.3%
Other asbestos work	0	0.0%	1	0.5%	1	0.2%	0	0.0%	2	0.1%
Waterside workers	2	3.5%	15	7.1%	34	7.2%	19	3.2%	70	5.2%
Armed forces	0	0.0%	6	2.8%	29	6.1%	27	4.5%	62	4.6%
Laggers/insulators	1	1.8%	8	3.8%	21	4.4%	16	2.7%	46	3.4%
Ship building	0	0.0%	7	3.3%	17	3.6%	11	1.8%	35	2.6%
Asbestos cement production	1	1.8%	2	0.9%	16	3.4%	14	2.4%	33	2.5%
Automotive (brakes)	0	0.0%	2	0.9%	11	2.3%	13	2.2%	26	1.9%
Non-asbestos mining	0	0.0%	0	0.0%	2	0.4%	2	0.3%	4	0.3%
Building/construction workers	2	3.5%	28	13.3%	84	17.6%	175	29.4%	289	21.7%
Other occupations ^c	2	3.5%	11	5.2%	34	7.2%	51	8.6%	98	7.3%
Electricians	0	0.0%	2	0.9%	6	1.3%	28	4.7%	36	2.7%
Boilermakers/welders	1	1.8%	6	2.8%	16	3.4%	26	4.4%	49	3.7%
Power station workers	0	0.0%	1	0.5%	8	1.7%	11	1.8%	20	1.5%
Pipe fitters	1	1.8%	2	0.9%	3	0.6%	11	1.8%	17	1.3%
No known exposure ^d	4	7.0%	14	6.6%	39	8.2%	18	3.1%	75	5.6%
TOTAL	57	100.0%	211	100.0%	475	100.0%	595	100.0%	1338	100.0%

^aThe highlighted percentages show the decade with the highest proportion of MM cases for each occupational group.

^bABA=Australian Blue Asbestos company.

^cOccupations that are not covered by the presented list of occupational groups.

^dNo identifiable source of asbestos exposure