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Identifying industrial sites with potential for residential exposure to asbestos

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Abstract

Background Non-occupational exposure to asbestos has been of increasing interest, but residential exposure to asbestos often focuses on a few high-profile asbestos users. This study aimed to identify industrial sites producing asbestos goods in a given area and time period.

Methods A search of trade directories was carried out for industrial sites in West Yorkshire, England, where asbestos may have been used this century.

Results A large number of factories with potential for residential exposure were found. A total of 269 factories in West Yorkshire used asbestos between 1900 and 1979, many for short periods only.

Conclusions Identification of potential sources of residential exposure to asbestos would have greatly underestimated their number if either only high-profile users or existing official listings had been used. Any consideration of asbestos use should aim to identify all users, not just the high-profile manufacturers.

Keywords: asbestos, mesothelioma, non-occupational exposure

Background

Asbestos has been in occasional use for hundreds of years, but was not widely used until the late nineteenth century. Then technical advances, and recognition of its properties, led to its use for asbestos cement sheets and pipes, flooring and roofing products, friction products, thermal insulation materials and textiles, and coatings.[1] Evidence linking occupational exposure to asbestos to disease has increased, particularly since 1960 when mesothelioma and asbestos were causally linked.[2] Although much research has been about occupational exposure, more recent research has examined the effects of non-occupational exposure to asbestos, including residential exposure.[3,4]

There was local concern about the number of mesothelioma cases in workers from two factories in West Yorkshire.[5,6] For one of these, there was also concern about risks to residents currently living near the factory, even though it closed in 1958.[5,7] A case–control study investigated the contribution of different routes of asbestos exposure to mesothelioma, including living near a factory using asbestos (residential exposure).[8,9] Although a few high-profile industrial users were seen as potential sources of asbestos in the community, many other local factories used asbestos. This paper describes the methods and results of investigating the distribution of industrial uses of asbestos that might have led to residential asbestos exposure in West Yorkshire between 1900 and 1979.

Methods

Subjects in the case–control study died in one of five health districts in West and North Yorkshire. Information on subjects' occupational and non-occupational exposure to asbestos was obtained from interviews. However, as many respondents would not know about nearby factories using asbestos, this information was also sought by other means. Asbestos goods manufacturers were sought in the postal districts of Leeds, Bradford, Halifax, Wakefield, Huddersfield and York. The York data have been omitted in this paper, to give a study area of contiguous districts.

The aim was to identify industrial sites where asbestos might have been emitted into the environment (e.g. via loading, ventilation or waste disposal) thereby exposing nearby residents. Plumbing or electrical businesses, more likely to emit asbestos at the sites of their clients than their own base, were not included. Similarly, businesses known to sell rather than manufacture asbestos items were omitted: such activities were assumed to give rise to much lower levels of residential asbestos exposure. Factories in the study area that were active in the period 1900–1979 and considered to use asbestos were identified from trade directories (e.g. Kelly's, Barrett's, Classified Telephone Directories or Yellow Pages) by searching for specific activities. The search terms used are given in Table 1. Local experts were consulted for information about the work carried out at some sites. The final date of 1979 was chosen

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because we were interested in asbestos usage that could be linked to cases of mesothelioma occurring before 1992 (assuming a latency of at least 15 years).

Data were sought on the period businesses traded, and a description of their activity; these were classified into nine groups (Table 1). The first seven groups manufactured asbestos products. In the eighth group, the activity was described as asbestos products, but it was unclear whether they were manufactured there. The final group was insulation products, where it was not certain that asbestos was used or that manufacture took place there. A factory was listed more than once if it changed its activity group over time, or more than 3 years occurred between successive listings.

Results

A total of 269 different business–activity combinations were identified in the study area and period. Seven addresses occurred more than once: three were apparently the same firm reappearing after an interval of at least 4 years in the directory listings; four were firms that had changed their listed activities. The majority of businesses were within the urban centres of Leeds (46 per cent) or Bradford (36 per cent); the remaining districts were a mixture of urban and semi-rural areas. In 1971 the total population of the study area was approximately 1.8 million.

Table 1 shows the distribution of activities at these factories, the duration of time they were active, and the decades during which they were active. The most common activities were general asbestos goods manufacture and engine packing manufacture. There were also large numbers in the last category, where it was not certain that the asbestos goods were manufactured. Many manufacturers were apparently active only for short periods: 45 per cent for less than 5 years. The numbers of asbestos-using factories in West Yorkshire reached a maximum in the 1960s, but did not change radically over the decades.

Discussion

Although the identification of firms using asbestos is of interest, given the increased health risks to workers, there are no routine published measures of local asbestos usage. A recent atlas of cancer incidence gave some information from the Health and

Table 1 Characteristics of 269 factories using asbestos in West Yorkshire between 1900 and 1979

	No.	%
Activity group		
(1) Asbestos goods manufacturers	59	22
(2) Engine packing, steam packing and metallic packing manufacturers	61	23
(3) Brake and clutch lining manufacturers	29	11
(4) Gaskets and jointing manufacturers	9	3
(5) Railway carriage, locomotive and steam engine manufacturers	9	3
(6) Insulation, boiler covering and packing manufacturers	6	2
(7) Fibrous or fire cement and fibrous plaster manufacturers	18	7
(8) Asbestos cement, asbestos roofing, asbestos building materials, asbestos fibre suppliers (may not manufacture)	25	9
(9) Insulation specialist, boiler covering, engine packing, fireproofing, steam products manufacturers (may not manufacture or may not use asbestos)	53	20
Duration of operation (years)		
<1	55	20
1–4	67	25
5–9	43	16
10–19	47	17
20–29	28	10
30–39	15	6
≥40	14	5
*Operating during decade**		
1900–1909	62	23
1910–1919	61	23
1920–1929	79	29
1930–1939	61	23
1940–1949	61	23
1950–1959	79	29
1960–1969	98	36
1970–1979	45	17

* Percentages do not add up to 100 as factories may have operated in more than one decade.

Safety Executive's Asbestos Survey, based on factories using asbestos known to HSE medical advisors since the 1970s.[10,11] West Yorkshire was identified as having 15 factories, far fewer than the 45 identified in this survey over the period 1970–1979. However, 11 of the 45 identified in this study were in categories where asbestos manufacture was not certain.

The use of trade directories could not guarantee to identify all relevant businesses. Omissions could occur if the firm chose not to have an entry in some directories, or if the description of their activities was not clear-cut. Our classification did not cover defence-item manufacturers using asbestos, which would have been of particular interest during the first or second world wars: the directory listings were not specific enough. However, occupational histories from the case–control study suggest that some defence industries in the area used asbestos (e.g. one subject packed shells in asbestos). In the early part of the century directories were not always published annually; so some short-lived businesses may not have been detected, and estimates of duration may be a slight underestimate. Nevertheless, this study shows that a large number of businesses in the area used asbestos, although many will have been forgotten, because they were active a long time ago or for short periods only.

However, these were only potential sources of asbestos to residents nearby. Many of the factories were situated in areas with little or no housing near them. In the recent case–control study the information on the industrial sites was linked to that of lifetime residential histories of the subjects: only 30 per cent of the identified industrial sites ever had one of the 344 subjects in the study living within 0.5 km.[8]

National figures suggest that asbestos imports, and therefore use, increased over the century until the 1970s.[1] This pattern is reflected in the numbers of asbestos-using firms in West Yorkshire. However, the rise in the number of firms across the decades was not steep: there were many firms active earlier in the century.

Identification of potential sources of residential exposure to asbestos would have greatly underestimated their number if either high-profile users or existing official listings had been the only source of information. Overall, this study has shown that West Yorkshire had many factories using asbestos over the century, many for short periods. This pattern is likely to be repeated in other industrial areas. While the issue of the strength of any association between residential exposure to asbestos and disease is still not settled, any study should aim to identify all users, not just the high-profile or long-term manufacturers.

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