

NOTES

Asbestos-Related Health Risks in Estonia

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Asbestos has been declared a proven human carcinogen by the U.S. Environmental Protection Agency and by the International Agency for Research on Cancer of the World Health Organization. Since 1983, the European Union has enforced health protection directions in this field, which have been the basis for legal acts of Member States.

The Estonian Republic is a country where asbestos and asbestos-containing materials have been used in quite large quantities, especially during the Soviet period. Today the use and sale of asbestos minerals and asbestos containing products are prohibited in Estonia. Unfortunately there has been no substantial overview of the health status of workers exposed to asbestos. The objective of this study was to evaluate the extent of health risks of workers exposed to asbestos in Estonia.

asbestos health protection prevention screening

1. BACKGROUND

Asbestos has been widely used in modern society in constructions mainly as a building and insulation material in products of the machine industry, installations, and consumer products. During the production, processing, and use of asbestos products asbestos fibres may be released. They pose a risk to

the workers and through the polluted environment to the whole population. Asbestos fibres can be found practically everywhere. It is unknown how many fibres a year or during a lifetime constitute the critical value. It has been proven that exposure to asbestos dust may cause asbestosis (diffuse pulmonary fibrosis), lung cancer, cancer of the pleura and the peritoneum (mesothelioma), and pleural diseases.

The Occupational Health and Safety Requirements (2000) for asbestos work have been compiled on the basis of the Estonian Occupational Health and Safety Act (1999). It provides that the employer is obliged to observe regularly the state of the working environment and measure the amount of asbestos in the air. Sampling shall be carried out by suitably qualified personnel and analyzed in a laboratory equipped with the necessary identification techniques. The use and import of crocidolite asbestos and the application of asbestos by means of the spraying process have been prohibited in accordance with this act. Limit values of hazardous substances in the working environment were validated on the basis of Chemicals Act (1998). According to it the limit value for asbestos (except for crocidolite) in workplace air in Estonia is 0.1 f/ml.

During 1997–1999 the Estonian Institute of Experimental and Clinical Medicine participated in a European Union project “Prevention of asbestos-related diseases in Hungary, Estonia and Karelian Republic of the Russian Federation.” The aim of this project was to improve the safety in the use of asbestos, to evaluate the extent of health risks, and to establish diagnostic criteria for asbestos-related diseases in the countries of Central Europe and in the New Independent States. To estimate health risks related to exposure to asbestos, the use of asbestos-containing materials in buildings was surveyed and exposure levels were determined. The occurrence of asbestos products in 100 buildings was surveyed, asbestos-containing materials were found in 83 of them. Airborne levels of asbestos fibres in workplaces were up to 0.5 fibres/cm³, exceeding five times the limit value established in Estonia (Kangur et al., 2001).

2. MATERIAL AND METHODS

In 1993–1994 the Estonian Institute of Experimental and Clinical Medicine in collaboration with the Labour Inspectorate carried out a questionnaire study to determine the use of asbestos in Estonia. Material and dust samples were collected in various workplaces. The measurements were carried out with the Asbestos International Association Recommended Technical Method

No. 1: The reference method for the determination of airborne asbestos fibre concentrations at workplaces by light microscopy (a membrane filter method). According to this questionnaire study more than 6,000 workers were exposed to asbestos in their workplaces and approximately 22,000 tons of asbestos and asbestos-containing materials were used (Kangur, Jaakmees, Moks, Kahn, & Veidebaum, 1998).

On the basis of the previous questionnaire study, in 1995–1997 the Health Protection Inspectorate performed personal inquiries of workers exposed to asbestos. A special questionnaire form was worked out in the Health Protection Inspectorate (P. Krooni) for estimating the health risk of occupational exposure to asbestos (A Personal Card of Occupational Health Care). The card included the following items: age and gender of the worker, duration of dust exposure (including daily exposure), smoking habits, the use of personal protective equipment, and so forth.

The employers were informed of the study and approved it. The health and safety specialists of every county assisted in performing the study. Participation in the study was voluntary.

3. RESULTS

Three hundred and twenty personal questionnaires were filled, 86% of them by men, 14% by women. Asbestos has been used more in largest industrial districts, that is, in the North-East of Estonia and Harju County (in Tallinn as well). Fifty-four percent of the questionnaires were received from those districts. The use of asbestos is not so intensive in other districts of Estonia.

The average age of the workers exposed to asbestos was 43.0 years. Most workers (81.25%) were older than 30 years, 18.75% were younger than 30.

According to the questionnaire study mechanics-locksmiths, machine operators, construction workers, and thermal insulators were most exposed to asbestos (Figure 1). The study indicated that several other professions were exposed to asbestos as well, for example, welders, turners, storekeepers, cleaners, firemen, and so forth.

It turned out that 26 various asbestos products were used, more often asbestos cement products (roofing sheets, pipes, etc.), asbestos textile products, and friction materials. During the use of asbestos cement products (except abrasion) there is a limited release of fibres because of the strong binding of cement. Raw asbestos was used by 12.8% of the subjects (mostly for preparation of insulation mixtures). Thermal insulation work (installation, repair, or

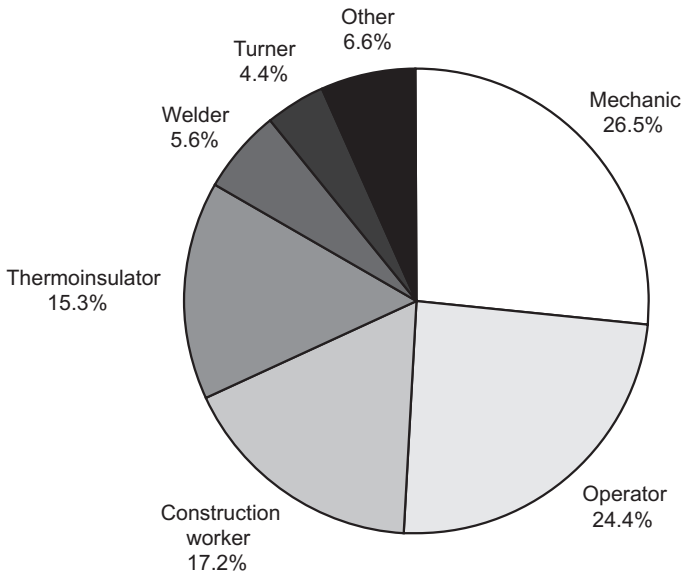


Figure 1. The number of workers exposed to asbestos.

removal), where the highest concentrations were found ($0.30\text{--}0.49\text{ f/cm}^3$), was a more hazardous work process. Thermal insulation products are particularly dangerous because asbestos fibres are readily released. In transport enterprises asbestos concentration during the removal of friction materials was up to 0.15 f/cm^3 in workplace air (Kangur et al., 2001).

The duration of exposure to asbestos among asbestos-exposed workers was as follows: 59.1% up to 10 years, 30.3% from 10 to 20, and 10.6% more than 20 years. Exposure to asbestos during the workday lasted less than 1 hr for 47.8% (153 workers), from 1 to 4 for 26.9% (86 workers), and from 5 to 8 hrs for 25.3% (81 workers).

Three hundred and nine asbestos-exposed workers answered a question about their smoking habits. One hundred and seventy-two workers (53.8%) were active or ex-smokers, 137 (42.8%) did not smoke, whereas 11 (3.4%) did not reply to this question. Workers smoked from 1 to 40 years (more than 50 in one case), with the average of 18.25 years.

One hundred and eighty-nine workers answered a question about having suffered or suffering from lung diseases. Thirty-five workers (18.5%) gave an affirmative answer. Bronchitis (chronic, allergic) and pneumonia were mostly mentioned. One hundred and ninety-four workers (60.6%) used personal protective means, 16.6% of the subjects did not answer the question, the rest did not use them.

4. DISCUSSION

The research provided an overview of the use of asbestos in Estonia. The results do not differ considerably from those from publications in other countries. The present analysis is not still complete as data were not received from all the enterprises involved (e.g., ship repairing factories). It was a problem to obtain information about asbestos-exposed workers from small-scale companies as well.

Pneumoconiosis (asbestosis) caused by the use of asbestos and other mineral fibres has not been registered in Estonia during the investigated period (1993–1997), although the performed investigations of the working environment and long-term use of asbestos presume it.

Effective legal measures have been implemented to reduce asbestos-related risk and to identify asbestos in the working environment.

5. CONCLUSIONS

Considering the long-term use of asbestos and the large number of workers exposed to it, the following recommendation should be considered:

- to continue monitoring of exposure to asbestos,
- to continue and improve medical surveillance of asbestos-exposed workers,
- to take measures to minimize risk related to exposure to asbestos,
- to improve the diagnosis of asbestos-induced diseases.

The present results of investigations reveal the importance of this problem and indicate a need to intensify these studies.

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