



**World Health
Organization**

Elimination of asbestos- related diseases

World Health Assembly Resolution 58.22 from 2005 on cancer prevention and control urged Member States to pay special attention to cancers for which avoidable exposure is a factor, particularly exposure to chemicals at the workplace and the environment. Asbestos is one of the most important occupational carcinogens causing about half of the deaths from occupational cancer (1;2). Furthermore, the Thirteenth Session of the Joint ILO/WHO Committee on Occupational Health in 2003 recommended that special attention should be paid to the elimination of asbestos-related diseases (3).

The term "asbestos" designates a group of naturally occurring fibrous serpentine or amphibole minerals with current or historical commercial usefulness due to their extraordinary tensile strength, poor heat conduction, and relative resistance to chemical attack. The principal varieties of asbestos are chrysotile, a serpentine material, and crocidolite, amosite, anthophyllite, tremolite and actinolite, which are amphiboles (4).

Exposure to asbestos causes a range of diseases, such as lung cancer, mesothelioma, and asbestosis (fibrosis of the lungs), as well as pleural plaques, thickening and effusions (5;6). There is also evidence that it causes laryngeal and possibly some other cancers (7).

Exposures to asbestos and its impact on public health are substantial

Exposure to asbestos occurs through inhalation of fibres primarily from contaminated air in the working environment, as well as from ambient air in the vicinity of point sources, or indoor air in housing and buildings containing friable asbestos materials. The highest levels of exposure occur during repackaging of asbestos containers, mixing with other raw materials and dry cutting of asbestos-containing products with abrasive tools. Exposure can also occur during installation and use of asbestos-containing products and maintenance of vehicles. Friable chrysotile and/or amphibole-containing materials are still in place in many buildings and continue to give rise to exposure to both chrysotile and amphiboles during maintenance, alteration, removal and demolition (5).

Currently about 125 million people in the world are exposed to asbestos at the workplace (1). According to global estimates at least 90,000 people die each year from asbestos-related lung cancer, mesothelioma and asbestosis resulting from occupational exposures (1;2;8). In addition, it is believed that several thousands of deaths can be attributed to other asbestos-related diseases as well as to non-occupational exposures to asbestos. The burden of asbestos-related diseases is still rising, even in countries that have banned the use of asbestos in the early 1990s. Because of the long latency periods attached to the diseases in question, stopping the use of asbestos now will only result in a decrease in the number of asbestos-related deaths after a number of decades.

All types of asbestos cause cancer in humans

Asbestos (actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite) has been classified by the International Agency for Research on Cancer as being carcinogenic to humans (9). Exposure to

chrysotile, amosite and anthophyllite asbestos and to mixtures containing crocidolite results in an increased risk of lung cancer (9). Mesotheliomas have been observed after occupational exposure to crocidolite, amosite, tremolite and chrysotile, as well as among the general population living in the neighbourhood of asbestos factories and mines and in people living with asbestos workers (9).

The incidence of asbestos-related diseases is related to fibre type, fibre size, fibre dose and to industrial processing of the asbestos (6). No threshold has been identified for the carcinogenic risk of chrysotile (5). Cigarette smoking increases the risk of lung cancer from asbestos exposure (5;10).

Chrysotile is still widely used

Asbestos has been used in thousands of products for a vast number of applications, such as roofing shingles, water supply lines, fire blankets, plastic fillers, and medical packing, as well as clutches and brake linings, gaskets and pads for automobiles. As a result of increasing health concerns, the use of asbestos has declined in many countries. The use of crocidolite and products containing this fibre as well as spraying of all forms of asbestos have been prohibited under the ILO Convention No. 162 from 1986 Concerning Safety in the Use of Asbestos. However, chrysotile asbestos is still widely used, with approximately 90% being employed in asbestos-cement building materials, the largest users of which are developing countries (11). Other remaining uses of chrysotile are friction materials (7%), textiles and other applications (11).

To date, more than 40 countries, including all member states of the European Union, have banned the use of all forms of asbestos, including chrysotile. Other countries have introduced less stringent restrictions. However, some countries have maintained or even increased their production or use of chrysotile in recent years (12). World production of asbestos in the period 2000-2005 has been relatively stable, at between 2,050,000 and 2,400,000 metric tonnes per annum (13;14).

WHO recommendations on prevention of asbestos-related diseases

Bearing in mind that there is no evidence for a threshold for the carcinogenic effect of asbestos and that increased cancer risks have been observed in populations exposed to very low levels (5;9), the most efficient way to eliminate asbestos-related diseases is to stop using all types of asbestos. Continued use of asbestos cement in the construction industry is a particular concern, because the workforce is large, it is difficult to control exposure, and in-place materials have the potential to deteriorate and pose a risk to those carrying out alterations, maintenance and demolition (5). In its various applications, asbestos can be replaced by some fibre materials (15) and by other products which pose less or no risk to health.

Materials containing asbestos should be encapsulated and, in general, it is not recommended to carry out work that is likely to disturb asbestos fibres. If necessary, such work should be carried out only under strict preventive measures to avoid exposure to asbestos, such as encapsulation, wet processes, local exhaust ventilation with filtration, and regular cleaning. It also requires the use of personal protective equipment - special respirators, safety goggles, protective gloves and clothing - and the provision of special facilities for their decontamination (16).

WHO is committed to work with countries towards elimination of asbestos-related diseases in the following strategic directions:

- by recognizing that the most efficient way to eliminate asbestos-related diseases is to stop the use of all types of asbestos;

- to provide information about solutions for replacing asbestos with safer substitutes and developing economic and technological mechanisms to stimulate its replacement;
- to take measures to prevent exposure to asbestos in place and during asbestos removal (abatement);
- to improve early diagnosis, treatment, social and medical rehabilitation of asbestos-related diseases and to establish registries of people with past and/or current exposures to asbestos.

WHO strongly recommends planning for and implementation of these measures as part of a comprehensive national approach for elimination of asbestos-related diseases. Such an approach should also include: developing national profiles; awareness raising; capacity building; an institutional framework; and a national plan of action for elimination of asbestos-related diseases.

WHO will collaborate with ILO on the implementation of the Resolution on Asbestos, adopted by the Ninety-fifth Session of the International Labour Conference (17) and will work with other intergovernmental organizations and civil society towards elimination of asbestos-related diseases worldwide.

References

- (1) Concha-Barrientos M et al. Selected occupational risk factors. In: Ezzati M et al, eds. *Comparative quantification of health risks: global and regional burden of diseases attributable to selected major risk factors*. Geneva, World Health Organization; 2004:1651-1801.
- (2) Driscoll T et al. The global burden of diseases due to occupational carcinogens. *American Journal of Industrial Medicine*, 2005, 48(6):419-431.
- (3) ILO, WHO. Report of the Committee JCOH/2003/D.4. *Thirteenth Session of the Joint ILO/WHO Committee on Occupational Health*. Geneva, International Labour Office, 2003.
- (4) WHO. Asbestos. In: *Air Quality Guidelines*, 2nd ed. Copenhagen: WHO Regional Office for Europe; 2000.
- (5) WHO. *Environmental Health Criteria 203: Chrysotile Asbestos*. Geneva, World Health Organization; 1998.
- (6) WHO. *Environmental Health Criteria 53: Asbestos and Other Natural Mineral Fibres*. Geneva, World Health Organization, 1986.
- (7) Committee on Asbestos: Selected Health Effects, Board on Population Health and Public Health Practices. *Asbestos: Selected Cancers*. Washington, D.C., The National Academies Press, 2006.
- (8) Driscoll T et al. The global burden of non-malignant respiratory disease due to occupational airborne exposures. *American Journal of Industrial Medicine*, 2005, 48(6):432-445.
- (9) IARC. *IARC Monographs, Supplement 7: Asbestos*. Lyon, International Agency for research on Cancer, 1987.
- (10) IARC. *IARC Monographs Vol. 83: Tobacco Smoke and Involuntary Smoking*. Lyon, International Agency for Research on Cancer, 2006.
- (11) Perron L. Chrysotile. In: *Canadian Minerals Yearbook, 2003*. Ottawa, Natural Resources Canada, 2003:18.1-18.11.
- (12) Virta RL. *Worldwide asbestos supply and consumption trends from 1900 to 2000: Open-File Report 03-83*. U.S. Department of the Interior, U.S. Geological Survey, 2003.

- (13) Virta RL. Asbestos. In: *USGS 2005 Minerals Yearbook*. U.S. Department of Interior, 2006:8.1-8.6.
- (14) Virta RL. Asbestos. In: *USGS 2004 Minerals Yearbook*. U.S. Department of the Interior, 2005:8.1-8.3.
- (15) WHO. *Summary Consensus Report of WHO Workshop on Mechanisms of Fibre Carcinogenesis and Assessment of Chrysotile Asbestos Substitutes, 8-12 November 2005, Lyon, France*. Geneva, World Health Organization, 2005.
- (16) IPCS. *Chrysotile: International Chemical Safety Card 0014*. International Programme on Chemical Safety, Geneva, 1999
- (17) Resolution Concerning Asbestos. In: *Ninety-fifth International Labour Conference, Geneva, 31 May - 16 June 2006. Report of the Committee on Safety and Health*. Geneva, International Labour Conference (Provisional Record 20), Annex 20/69.

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