

Elimination of asbestos-related diseases

Updated March 2014

Asbestos is one of the most important occupational carcinogens, causing about half of the deaths from occupational cancer (1, 2). In 2003, the Thirteenth Session of the Joint International Labour Organization (ILO)/World Health Organization (WHO) Committee on Occupational Health recommended that special attention should be paid to the elimination of asbestos-related diseases (3). World Health Assembly (WHA) 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 in the environment. In 2007, WHA Resolution 60.26 called for global campaigns to eliminate asbestos-related diseases, and in 2013, WHA Resolution 66.10 addressed prevention and control of noncommunicable diseases, including cancer.

Asbestos is one of the most important occupational carcinogens

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, including chrysotile, causes cancer of the lung, larynx and ovary, mesothelioma (a cancer of the pleural and peritoneal linings) and asbestosis (fibrosis of the lungs) (5–7).

Exposure 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 the amphiboles during maintenance, alteration, removal and demolition (5). Exposure can also occur as a consequence of natural disasters causing damage to buildings.

Currently, about 125 million people in the world are exposed to asbestos at the workplace (1). According to global estimates, at least 107 000 people die each year from

asbestos-related lung cancer, mesothelioma and asbestosis resulting from occupational exposures (1, 2, 8). In addition, nearly 400 deaths have been attributed to non-occupational exposure to asbestos. The burden of asbestos-related diseases is still rising, even in countries that 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 result in a decrease in the number of asbestos-related deaths only 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 (7). Exposure to chrysotile, amosite and anthophyllite and to mixtures containing crocidolite results in an increased risk of lung cancer (7). 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 (7).

The incidence of asbestos-related diseases is related to fibre type, size and dose and to industrial processing of the asbestos (6). No threshold has been identified for the carcinogenic risk of asbestos, including chrysotile (5, 7). Cigarette smoking increases the risk of lung cancer from asbestos exposure (5, 9).

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 and insulation materials, 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 and spraying of all forms of asbestos are prohibited under the ILO Convention concerning Safety in the Use of Asbestos (No. 162) from 1986. However, chrysotile is still widely used, with approximately 90% being employed in asbestos cement building materials, the largest users of which are developing countries. Other remaining uses of chrysotile are in friction materials (7%), textiles and other applications (10).

To date (end of 2013), more than 50 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 (11). Increased usage has been most prominent in the Asia-Pacific region. World production of asbestos in the period 2000–2012 was relatively stable, at approximately 2 million tonnes per annum (12, 13).



At least 107 000 people die each year from asbestos-related lung cancer, mesothelioma and asbestosis resulting from occupational exposures

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, including chrysotile, and that increased cancer risks have been observed in populations exposed to very low levels (5, 7), 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 (14) and by other products that 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 control 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 (15).

WHO is committed to working with countries towards the 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;
- by providing information about solutions for replacing asbestos with safer substitutes and developing economic and technological mechanisms to stimulate its replacement;
- by taking measures to prevent exposure to asbestos in place and during asbestos removal (abatement);
- by improving early diagnosis, treatment and rehabilitation services for asbestos-related diseases and establishing registries of people with past and/or current exposure to asbestos.

WHO strongly recommends planning for and implementing these measures as part of a comprehensive national approach for the 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 the elimination of asbestos-related diseases.

WHO will collaborate with ILO on implementation of the Resolution concerning asbestos, adopted by the Ninety-fifth Session of the International Labour Conference (16), and will work with other intergovernmental organizations and civil society towards the elimination of asbestos-related diseases worldwide.

References

1. Concha-Barrientos M, Nelson D, Driscoll T, Steenland N, Punnett L, Fingerhut M et al. Chapter 21. Selected occupational risk factors. In: Ezzati M, Lopez A, Rodgers A, Murray C, editors. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. Geneva: World Health Organization; 2004:1651–801 (http://www.who.int/healthinfo/global_burden_disease/cra/en/, accessed 11 March 2014).
2. Driscoll T, Nelson DI, Steenland K, Leigh J, Concha-Barrientos M, Fingerhut M et al. The global burden of disease due to occupational carcinogens. *Am J Ind Med.* 2005;48(6):419–31.
3. ILO, WHO. Summary report of the Thirteenth Session of the Joint ILO/WHO Committee on Occupational Health, 9–12 December 2003, Geneva. JCOH/2003/D.4. Geneva: International Labour Organization; 2003 (http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_110478.pdf, accessed 13 March 2014).
4. 6.2 Asbestos. In: Air quality guidelines for Europe, second edition. WHO Regional Publications, European Series, No. 91. Copenhagen: World Health Organization Regional Office for Europe; 2000 (http://www.euro.who.int/__data/assets/pdf_file/0005/74732/E71922.pdf, accessed 11 March 2014).
5. Environmental Health Criteria 203: Chrysotile asbestos. Geneva: World Health Organization, International Programme on Chemical Safety; 1998 (<http://www.inchem.org/documents/ehc/ehc/ehc203.htm>, accessed 11 March 2014).
6. Environmental Health Criteria 53: Asbestos and other natural mineral fibres. Geneva: World Health Organization, International Programme on Chemical Safety; 1986 (<http://www.inchem.org/documents/ehc/ehc/ehc53.htm>, accessed 13 March 2014).
7. International Agency for Research on Cancer. Asbestos (chrysotile, amosite, crocidolite, tremolite, actinolite, and anthophyllite). *IARC Monogr Eval Carcinog Risks Hum.* 2012;100C:219–309 (<http://monographs.iarc.fr/ENG/Monographs/vol100C/index.php>, accessed 11 March 2014).
8. Driscoll T, Nelson DI, Steenland K, Leigh J, Concha-Barrientos M, Fingerhut M et al. The global burden of non-malignant respiratory disease due to occupational airborne exposures. *Am J Ind Med.* 2005;48(6):432–45.
9. International Agency for Research on Cancer. Tobacco smoke and involuntary smoking. *IARC Monogr Eval Carcinog Risks Hum.* 2006;83.
10. Perron L. Chrysotile. In: Canadian minerals yearbook, 2003. Ottawa: Natural Resources Canada; 2003:18.1–18.11.
11. Virta RL. Worldwide asbestos supply and consumption trends from 1900 through 2003. Circular 1298. Reston (VA): United States Department of the Interior, United States Geological Survey; 2006 (<http://pubs.usgs.gov/circ/2006/1298/c1298.pdf>, accessed 11 March 2014).
12. Virta RL. Asbestos [Advance release]. In: 2012 minerals yearbook. Reston (VA): United States Department of the Interior, United States Geological Survey; 2013:8.1–8.7 (<http://minerals.usgs.gov/minerals/pubs/commodity/asbestos/myb1-2012-asbes.pdf>, accessed 11 March 2014).
13. Virta RL. Asbestos statistics and information. In: Mineral commodity summaries 2013. Reston (VA): United States Department of the Interior, United States Geological Survey; 2013 (<http://minerals.usgs.gov/minerals/pubs/commodity/asbestos/mcs-2013-asbes.pdf>, accessed 11 March 2014).
14. Summary consensus report of WHO Workshop on Mechanisms of Fibre Carcinogenesis and Assessment of Chrysotile Asbestos Substitutes, 8–12 November 2005, Lyon. Geneva: World Health Organization; 2005 (http://www.who.int/ipcs/publications/new_issues/summary_report.pdf, accessed 11 March 2014).
15. International Chemical Safety Card 0014: Chrysotile. Geneva: World Health Organization, International Programme on Chemical Safety; 2010 (<http://www.inchem.org/documents/icsc/icsc/eics0014.htm>, accessed 13 March 2014).
16. Annex: Resolution concerning asbestos. In: Provisional Record 20 of the Ninety-fifth Session of the International Labour Conference, 31 May – 16 June 2006, Geneva: Report of the Committee on Safety and Health. Geneva: International Labour Organization; 2006:20/69 (<http://www.ilo.org/public/english/standards/relm/ilc/ilc95/pdf/pr-20.pdf>, accessed 13 March 2014).