

ASBESTOS IS STILL WITH US: REPEAT CALL FOR A UNIVERSAL BAN

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Abstract

All forms of asbestos are proven human carcinogens. All forms of asbestos cause malignant mesothelioma, lung, and laryngeal cancers, and may cause ovarian, gastrointestinal and other cancers. No exposure to asbestos is without risk, and there is no safe threshold of exposure to asbestos. Asbestos cancer victims die painful lingering deaths. These deaths are almost entirely preventable. When evidence of the carcinogenicity of asbestos became incontrovertible, the concerned parties, including the Collegium Ramazzini, called for a universal ban on the mining, manufacture and use of asbestos in all countries around the world [1]. Asbestos is now banned in 52 countries [2], and safer products have replaced many materials that once were made with asbestos. Nonetheless, a large number of countries still use, import, and export asbestos and asbestos-containing products. And in many countries that have banned other forms of asbestos, the so-called “controlled use” of chrysotile asbestos continues to be permitted, an exemption that has no basis in medical science but rather reflects the political and economic influence of the asbestos mining and manufacturing industry. To protect the health of all people in the world — industrial workers, construction workers, women and children, now and in future generations — the Collegium Ramazzini calls again today on all countries of the world, as we have repeatedly in the past, to join in the international endeavor to ban all forms of asbestos. An international ban on asbestos is urgently needed.

Key words:

Asbestos, Chrysotile, Collegium Ramazzini, Chemical carcinogenesis, Global health

INTRODUCTION

Asbestos is a term applied to six naturally occurring fibrous minerals. These minerals occur in two configurations: serpentine and amphibole. The only type of asbestos derived from serpentine minerals, chrysotile, also known as white asbestos, accounts for 95% of the asbestos ever used around the world, and it is the only type of asbestos in commercial use today. Amphibole minerals include five asbestos species: amosite, crocidolite, tremolite, anthophyllite, and actinolite. The two forms of amphibole asbestos that previously were most commercially important — amosite, or brown asbestos, and crocidolite, or blue asbestos — are no longer in use.

Asbestos fibers can withstand fire, heat and acid. They have great tensile strength. They provide thermal insulation and acoustic insulation. For these reasons, asbestos had come into wide commercial use and given rise to a burgeoning industry many years before its detrimental health effects, which often take years to appear, became known.

All forms of asbestos cause asbestosis, a progressive, debilitating fibrotic disease of the lungs. All forms of asbestos cause human cancer. All forms of asbestos cause malignant mesothelioma, lung, laryngeal, and ovarian cancers. All forms of asbestos may cause gastrointestinal and other cancers [3].

Asbestos was declared a proven human carcinogen by the US Environmental Protection Agency (EPA), the

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* The Collegium Ramazzini, an international academic society that examines critical issues in occupational and environmental medicine, is dedicated to the prevention of disease and the promotion of health. The Collegium derives its name from Bernardino Ramazzini, the father of occupational medicine, a professor of medicine of the Universities of Modena and Padua in the early 1700s. Currently, 180 renowned clinicians and scientists from around the world, each of whom has been elected to membership, comprise the Collegium. It is independent of commercial interests (www.collegiumramazzini.org).

International Agency for Research on Cancer (IARC) of the World Health Organization, and the National Toxicology Program (NTP) more than 20 years ago [4–6]. The scientific community is in overwhelming agreement that there is no safe level of exposure to asbestos [7]. Moreover, there is no evidence of a threshold level below which there is no risk of mesothelioma [8].

THE ASBESTOS CANCER PANDEMIC

Occupational Exposures to Asbestos

About 125 million people around the world are exposed to asbestos in their work environments [9], and many million more workers have been exposed to asbestos in the past. About 20–40% of adult men report having worked in occupations that may have entailed asbestos exposures [10]. In the most highly affected age groups, mesothelioma may account for over 1% of all deaths [11,12]. In addition to mesothelioma, 5–7% of all lung cancers are potentially attributable to occupational exposures to asbestos [13].

Worldwide, the yearly number of asbestos-related cancer deaths in workers is estimated to be 100 000–140 000. In Western Europe, North America, Japan, and Australia, 20 000 new cases of lung cancer and 10 000 cases of mesothelioma result every year from exposures to asbestos [14]. In the United Kingdom, at least 3500 people die from asbestos-related illnesses each year, and this number is expected to increase to 5000 in future years [9]. The British mesothelioma death-rate is now the highest in the world, with 1740 deaths in men (1 in 40 of all male cancer deaths below age 80) and 316 in women in 2006. About 1 in 170 of all British men born in the 1940s will die of mesothelioma [12]. Australia's high incidence of mesothelioma is expected to reach 18 000 by 2020, with 11 000 cases yet to appear [15].

The US National Institute for Occupational Safety and Health (NIOSH) estimates that current occupational exposures to asbestos even at OSHA's permissible exposure limit will cause 5 deaths from lung cancer and 2 deaths from asbestosis in every 1000 workers exposed for a working lifetime [16].

Environmental Exposures to Asbestos

Non-occupational, environmental exposure to asbestos from the use of asbestos in construction materials is a serious and often neglected problem throughout the world. In the developed countries, large quantities of asbestos are found today as a legacy of past construction practices in many thousands of schools, homes, and commercial buildings. And in the developing countries, where asbestos continues to be used in large quantities in construction, asbestos-contaminated dust is now accumulating in thousands of communities.

More than 90% of the asbestos used worldwide today is used in the manufacture of asbestos-cement sheets and pipes, and most of this material is used in the developing countries. The use of asbestos in these materials continues despite repeated warnings that it is highly dangerous because of the large numbers of people exposed to airborne dust and the extreme difficulty of controlling exposures once these materials have been disseminated into communities where people of all ages, including young children, are at risk of exposure [17]. A pervasive problem with the use of asbestos-containing materials in construction is that asbestos fibers are released to air and dust as these materials weather, erode, break or are cut by saws and other power tools [9]. Community-wide exposure to persons of all ages is the end result.

Both community-based and industrial exposures to asbestos and asbestiform fibers increase the risk for mesothelioma [18]. Thus a study of women residing in Canadian asbestos mining communities found a sevenfold increase in the mortality rate from pleural cancer [19]. The risk of developing asbestos-related cancer following in-home exposures in communities near Canadian mines over a 30-year period is estimated to be 1 in 10 000 [20]. Likewise, environmental exposures to asbestos waste on the surfaces of roads and yards in a contaminated community of 130 000 residents in The Netherlands result each year in several cases of malignant mesothelioma [21]. And in a third example, the currently observed increase in female cases of mesothelioma in the United Kingdom, many with no occupational exposure to asbestos, suggests widespread environmental contamination [12].

Chrysotile Asbestos

Chrysotile represents 95% of all the asbestos ever used worldwide. It is the only variety in international trade in the 21st century. There is a general agreement among scientists and physicians, and a widespread support from numerous national health agencies in countries around the world, United Nations agencies, and the World Trade Organization, that chrysotile causes various cancers, including mesothelioma and lung cancer [22–31].

Early suggestions that chrysotile might be less dangerous than other forms of asbestos have not been substantiated. Although chrysotile accounts for almost all the asbestos ever used, the asbestos industry continues to claim that asbestos-related cancers are the result of the amphibole varieties [32,33]. Consultant experts of the Canadian chrysotile asbestos industry contend — falsely, and despite all the abundant medical and scientific evidence to the contrary — that “Exposure to chrysotile in a pure form seems likely to present a very low if any risk of mesothelioma” [34].

The Chrysotile Institute, a registered lobby group for the Quebec asbestos mining industry, takes the position that chrysotile can be handled safely [35]. But refuting this scientifically untenable and highly misleading position are numerous epidemiologic studies, case reports, controlled animal experiments, and toxicological studies which show clearly and consistently that chrysotile is highly dangerous and that it is fully capable of causing cancer [14,36–41]. These studies demonstrate that the so-called “controlled use” of asbestos is a fallacy [42]. Workers exposed to chrysotile fibers alone have excessive risks of lung cancer and excessive deaths from mesothelioma [43–45].

The Canadian Medical Association, the Canadian Cancer Society, and Canada’s leading health experts oppose the export of asbestos to the developing countries. The National Public Health Institute of Quebec (INSPQ) has published fifteen reports, all of them showing a failure to achieve the “controlled use” of asbestos in Quebec itself. Pat Martin, a member of Canada’s parliament and former asbestos miner asks, “If we in the developed world haven’t found a way to handle chrysotile safely, how can we expect them to do so in developing nations?” [46].

Current Production and Use of Asbestos

Despite all that is known about the health effects of asbestos, the annual world production remains at over 2 million tons. This level of production has remained steady following a 50% decline in the 1990s. Russia is now the leading producer of asbestos worldwide, followed by China, Kazakhstan, Brazil, Canada, Zimbabwe, and Colombia. These six countries accounted for 96% of the world production of asbestos in 2007 [47]. Russia has mines rich enough in asbestos deposits to last for more than 100 years at current levels of production. The majority of the 925 000 tons of asbestos extracted annually in Russia is exported.

Asbestos is now banned in 52 countries, including all EU member states, and safer products have replaced many that were once made with asbestos. Virtually all of the polymeric and cellulose fibers used instead of asbestos in fiber-cement sheets are greater than 10 microns in diameter and hence are non-respirable. Nonetheless, these 52 countries make up less than a third of WHO member countries.

Unfortunately, a much larger number of WHO member countries still use, import, and export asbestos and asbestos-containing products [30]. These are mostly the developing countries, and over 70% of the world production of asbestos is used today in Asia and Eastern Europe, in countries desperate for industrial growth and often naïve to the health effects of occupational and environmental exposures to asbestos. A recent article in *The Lancet* notes that “Vast development projects in Asia are largely responsible for maintaining the [chrysotile asbestos] market. In particular, India’s asbestos industry is burgeoning” [46].

In many countries that have banned other forms of asbestos, the “controlled use” of chrysotile asbestos is still permitted, despite all medical and scientific information to the contrary. This exemption reflects the size of the asbestos industry, its pervasive influence, and the importance of asbestos mining and manufacture to the economy. The toll in most countries still using large amounts of asbestos may never be fully recorded.

In the developing countries, where too often there exists little or no protection of workers and communities, the

asbestos cancer pandemic may be the most devastating. China is by far the largest consumer of asbestos in the world today, followed by India, Russia, Kazakhstan, Thailand, Ukraine, and Uzbekistan.

Position of United Nations Agencies on Asbestos

International organizations have condemned the continuing use of chrysotile asbestos [48]. In 2006, WHO called for the elimination of diseases associated with asbestos [30]. WHO supports individual countries in developing national plans to ban asbestos and eliminate asbestos disease. WHO has stated that “the most efficient way to eliminate asbestos-related disease is to stop using all types of asbestos”.

The ILO has expressed concern about an evolving epidemic of asbestos-related diseases, and passed a resolution to promote a worldwide asbestos ban [24].

The World Trade Organization has accepted the conclusion that the so-called “controlled use” of asbestos is a fallacy [49].

The Rotterdam Convention is an international treaty intended to regulate global trade in dangerous chemicals — chemicals that have been banned or severely restricted because of their hazards to human health or the environment. It was enacted in 2004, and 131 nations are currently parties to the Convention. The goal is to protect the world’s most vulnerable countries — developing countries and countries with economies in transition — against importation without their prior knowledge or consent of hazardous pesticides and other regulated chemicals.

Prior Informed Consent (PIC) is the core principle of the Rotterdam Convention. This legally binding procedure requires that governments in all countries be provided full information prior to importation about the risks to health and the environment of each of the hazardous materials regulated by the Convention. Annex III of the Rotterdam Convention contains a list of the chemicals — 37 in number — currently regulated by the Convention.

Repeated efforts to include chrysotile asbestos under the Rotterdam Convention have failed, because of the Convention’s requirement for unanimity and the

determined opposition of asbestos mining and manufacturing countries [50]. At the 2008 conference of parties on the Convention, opposition to chrysotile asbestos was led by Canada, Russia, and India. Kazakhstan and a few asbestos importing countries thwarted the will of over 100 other countries.

CONCLUSION — THE NEED FOR A UNIVERSAL BAN ON ASBESTOS

The profound tragedy of the asbestos pandemic is that virtually all illnesses and deaths related to asbestos are preventable. Safer substitutes for asbestos exist, and they have been introduced successfully in many nations. Asbestos-cement (A-C) pipes, sheets, and water storage tanks account for 90% of asbestos used in the world today. Substitutes for A-C water pipe include ductile iron pipe, high-density polyethylene pipe, and metal-wire-reinforced concrete pipe. Many substitutes exist for roofing, interior building walls and ceilings, including fiber-cement flat and corrugated sheet products, made with polyvinyl alcohol fibers and cellulose fibers. For roofing, lightweight concrete tiles can be made and used in the most remote locations, using locally available plant fibers including jute, hemp, sisal, palm nut, coconut coir, and wood pulp. Galvanized iron roofing and clay tiles are among the other alternative materials [51].

If the global use of asbestos were to cease today, a decrease in the incidence of asbestos-related diseases would become evident only two or more decades from now [30]. This delay is a consequence of the long latency period associated with the diseases caused by asbestos. In the case of mesothelioma, the latency between exposure and disease may be as long as 40–50 years.

The asbestos cancer pandemic may take as many as 10 million lives before asbestos is banned worldwide and all exposure is brought to an end [48,52]. In this conservative estimate, it is assumed that asbestos exposures are going to cease and that the epidemic will run itself out. But in fact, the world’s current production of asbestos continues at an alarming rate, and therefore

these figures may be underestimates of the true reality of this pandemic.

An international ban on the mining and use of asbestos is urgently needed. The risks of exposure to asbestos cannot be controlled by technology or by regulation of work practices. Scientists and responsible authorities in the countries allowing the use of asbestos should have no illusion that the “controlled use” of chrysotile asbestos is an effective alternative to a ban on all use of asbestos [53–54]. Even the best workplace controls cannot prevent occupational and environmental exposures to products in use or to their waste. Safer substitute products are available and in use in countries all over the world where asbestos is banned.

To protect the health of all people in the world — industrial workers, construction workers, women and children, now and in future generations — the Collegium Ramazzini calls again today on all countries of the world, as we have repeatedly in the past, to join in the international endeavor to ban all forms of asbestos. An international ban on asbestos is urgently needed.

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