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COMMENTARY

The Global Health Dimensions of Asbestos and Asbestos-Related Diseases

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Abstract

The Collegium Ramazzini (CR) reaffirms its long-standing position that responsible public health action is to ban all extraction and use of asbestos, including chrysotile. This current statement updates earlier statements by the CR with a focus on global health dimensions of asbestos and asbestos-related diseases (ARDs). The ARD epidemic will likely not peak for at least a decade in most industrialized countries and for several decades in industrializing countries. Asbestos and ARDs will continue to present challenges in the arena of occupational medicine and public health, as well as in clinical research and practice, and have thus emerged as a global health issue. Industrialized countries that have already gone through the transition to an asbestos ban have learned lessons and acquired know-how and capacity that could be of great value if deployed in industrializing countries embarking on the transition. The accumulated wealth of experience and technologies in industrialized countries should thus be shared internationally through global campaigns to eliminate ARDs.

KEY WORDS asbestos, chrysotile, lung cancer, mesothelioma, ovarian cancer

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BACKGROUND

Every asbestos fiber that is mined is indestructible, which repeatedly exposes many individuals during its life cycle from mining and extraction of asbestos-containing rocks to manufacturing of asbestos-containing products (ACPs), and further during use, repair, demolition, and abatement of ACPs. Since 1993, the Collegium Ramazzini has repeatedly called for a global ban on all mining, manufacture, and use of asbestos.[1-4] The Collegium has taken this position based on well-validated scientific evidence finding that all types of asbestos, including chrysotile, the most widely used form, cause cancers such as mesothelioma and lung cancer, and finding additionally that there is no safe level of exposure. The Collegium has continued to criticize as fallacious and unachievable the so-called controlled use of chrysotile advocated by the asbestos industry. Unfortunately, despite these concerns and abundant scientific evidence, global usage of chrysotile has remained at around 2 million metric tons per year in recent years. Most of this current use is concentrated in low- and middle-income countries.[5]

The Collegium reaffirms its position that, given the well-documented availability of safer, cost-effective alternative materials, the responsible public health action is to ban all extraction and use of asbestos. State-of-the-art technologies must be employed in asbestos removal and disposal. This current statement updates earlier statements with a focus on the global health dimensions of asbestos and asbestos-related diseases (ARDs).

UN ORGANIZATIONS

In 2006, the World Health Organization (WHO) called for the elimination of ARDs,[6] taking the position that the most efficient way to eliminate ARDs is to cease using all types of asbestos. The 2014 update of this statement, which was attached to the WHO document "Chrysotile Asbestos,[7]" published in response to the continuing widespread

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production and use of chrysotile, emphasized that all forms of asbestos, including chrysotile, are causally associated with an increased risk of cancer of the lung, larynx, and ovary; mesothelioma; and asbestosis. These observations are in line with the recent evaluation by the International Agency for Research on Cancer.[8] In its 2014 update, the WHO reiterated the call for global campaigns to eliminate ARDs. These efforts have been joined by other UN agencies, including the International Labour Organization and the United Nations Environment Programme. The Chemical Review Committee of the Rotterdam Convention has repeatedly recommended that chrysotile asbestos be put on the Convention's list of hazardous substances, thus requiring exporting countries to obtain prior informed consent from the importing countries. A handful of countries have opposed that recommendation, thus preventing this basic safety protection from coming into effect. The Collegium calls on all parties to the Rotterdam Convention to support the listing of chrysotile asbestos.

GLOBAL BURDEN OF ARDS

Occupational exposure to asbestos causes an estimated 107,000 deaths each year worldwide. These deaths result from asbestos-related lung cancer (ARLC), mesothelioma, and asbestosis.[6,7] When the global burden of each type of ARD was considered separately, the estimated number of deaths per year was 41,000 for ARLC,[9] 43,000[10]-59,000[7,9,11] for mesothelioma, and 7000[12]-24,000[13] for asbestosis. No estimate is available for the annual numbers of deaths as a result of asbestos-related cancers of the larynx or ovary. Because asbestos is more likely to cause lung cancer than mesothelioma, the total burden of ARDs will differ substantially with the estimated magnitude of ARLC. The WHO recently advanced a risk ratio of 6:1 for contracting lung cancer versus mesothelioma after chrysotile exposure.[7] Because these estimates are derived by different methods, inconsistencies might be eliminated through a cross-verification of the various estimation methods used. Regardless, the ARD burden is more likely to be underestimated than overestimated because ARDs are well known to be underdiagnosed and under-reported.

NATIONAL BANS

Since Iceland first introduced a ban on all types of asbestos in 1983, more than 50 countries have implemented similar bans.[14] However, the pace of countries adopting bans has slowed in the past decade. Indeed, the governments of several industrializing countries have withdrawn bans, and others have prescribed long periods over which to move toward a ban. Such actions are likely a consequence of the corrupting influence of pro-chrysotile lobbies, whether foreign or domestic. Asbestos industry lobbyists employ "product defense" science to foment uncertainty to sway the opinions of industrializing countries, a delaying tactic that, unfortunately, has often succeeded. Nine of the 10 most populous countries in the world, all of which use or have used substantial amounts of asbestos, have yet to adopt bans. Coverage of the world population by bans thus remains low and is biased toward industrialized countries.

ALTERNATIVES TO ASBESTOS

In countries where asbestos has been banned, safer, cost-effective substitute materials have been successfully introduced. Polyvinyl alcohol fibers and cellulose fibers can be used instead of asbestos in building products such as flat and corrugated fiber-cement sheets, which are used in roofing, interior walls, and ceilings. Polypropylene and cellulose fibers have been used instead of asbestos to make fiber-cement products in Brazil. Virtually all of the polymeric and cellulose fibers used instead of asbestos in fiber-cement sheets are >10 microns in diameter and hence are nonrespirable. For roofing in remote locations, lightweight concrete tiles can be fabricated using cement, sand, and gravel and, optionally, locally available plant fibers such as jute, hemp, sisal, palm nut, coconut coir, kenaf, and wood pulp. Galvanized iron roofing and clay tiles are other alternative materials. Substitutes for asbestos-cement pipe include ductile iron pipe, high-density polyethylene pipe, and metal-wire–reinforced concrete pipes.[15,16] Although these materials are considered safer than asbestos, good work practices should be observed for the protection of those working with these materials.

PATTERNS OF THE ARD EPIDEMIC

Countries continuing to use asbestos will shoulder the burden of ARDs in proportion to their prior levels of asbestos use.[17] Countries where asbestos has been banned or greatly limited invariably exhibit a sustained epidemic of ARDs. Age-adjusted mortality rates of mesothelioma are increasing in most industrialized countries,[18] but the rate of increase

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