

Eliminating Exposure to Asbestos

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Abstract

Each year, an estimated 255,000 people worldwide die from asbestos-related cancers and respiratory disease, with nearly 40,000 of these deaths occurring in the United States. Asbestos causes mesothelioma and cancer of the lung, larynx, and ovary, in addition to pleural diseases such as asbestosis; it is also strongly associated with cancer of the pharynx, stomach cancer, and colorectal cancer. There is no safe level of exposure to asbestos, and nearly 70 countries have banned it. The United States, however, continues to allow its import and use. From 1900 to present day, more than 31 million metric tons of asbestos have been used in the United States, and much of this asbestos remains in homes, schools, buildings, and consumer products. Among other recommendations, this policy statement calls on the U.S. government to ban asbestos; identify the prevalence of asbestos-containing materials in existing structures, including schools; and strengthen enforcement of environmental and occupational health standards for asbestos.

Relationship to Existing APHA Policy Statements

This policy statement is an update to APHA Policy Statement 20096 (Elimination of Asbestos). In addition, it relates to Policy Statements 201713 (Establishing Environmental Public Health Systems for Children at Risk or with Environmental Exposures in Schools) and 20077 (Calling on the US Congress to Restructure the Toxic Substances Control Act of 1976).

Problem Statement

Beginning in the 1950s, epidemiological studies focusing on asbestos-exposed workers revealed a significant risk of cancer mortality.[1–3] In 1976, the International Agency for Research on Cancer (IARC) concluded that asbestos is a human carcinogen, and today the IARC reiterates that there is no safe level of exposure to asbestos and that all forms are carcinogenic.[4–6] Asbestos causes mesothelioma and cancer of the lung, larynx, and ovary, as well as pleural diseases such as asbestosis; it is also strongly associated with cancer of the pharynx, stomach cancer, and colorectal cancer.[5]

Mesothelioma is a rare and almost invariably fatal cancer of the membrane that surrounds the lungs, heart, and abdomen. Exposure to asbestos causes mesothelioma, and the great majority of mesotheliomas are induced by asbestos.[7] The number of malignant mesothelioma deaths in the United States increased by 4.8% between 1999 and 2015. The average survival time for individuals with the disease is only 10 to 14 months. The prognosis for malignant mesothelioma is poor even when symptoms appear early and treatment begins quickly.[8] In addition to cancers, asbestos causes asbestosis (severe scarring of the lungs and shortness of breath) and damage to the pleural lining of the lungs. The most recent epidemiological studies complement the earlier seminal studies demonstrating the association between asbestos exposure and cancer.[9–14]

Asbestos-related diseases cause an estimated 255,000 deaths each year worldwide along with an estimated 39,275 deaths in the United States.[15] According to the World Health Organization (WHO), there is no evidence of a threshold for the carcinogenic effect of asbestos, and an increased cancer risk is observed in populations with very low levels of exposure.[16] In 2006, WHO urged member states to prevent asbestos-related disease by eliminating the use of all types of asbestos.[17] That same year, the World Federation of Public Health Associations called for a global ban on the mining and use of asbestos.[18] The Joint Policy Committee Societies of Epidemiology, Collegium Ramazzini, and others reiterate calls for asbestos bans.[19–21]

Several countries continue to mine and export asbestos. In 2018, Russia, Kazakhstan, China, and Brazil mined 1.1 million metric tons of asbestos minerals.[22] The Supreme Federal Court of Brazil enacted a comprehensive national asbestos ban, and, although challenged in court, Brazil's ban was upheld and mining and exports finally ceased in 2019.[22]

U.S. imports of asbestos: Nearly 70 countries have banned asbestos, but the United States has not done so and continues to allow the importation and use of asbestos. Since 1900, the United States has consumed more than 31 million metric tons (68.2 billion pounds) of asbestos. Much of this asbestos was used in building materials, automobile friction products, and textiles. In the face of increased knowledge, enhanced regulation, and growing liability, nearly all U.S. industries have substituted new materials and processes.

Today, nearly all U.S. imports of raw asbestos are used by the chlor-alkali industry. The U.S. Geological Survey (USGS) estimates that 325 to 750 metric tons of asbestos have been imported annually since 2011 by the chlor-alkali industry for use in the production of chlorine and sodium hydroxide. According to the American Chemistry Council, approximately 40% of chlorine produced in the United States is used to make polyvinyl chloride. Another 37% is used to produce organic chemicals employed in manufacturing and as solvents for metalworking, dry cleaning, and electronics. Roughly 4% of chlorine is used for water treatment.[23]

The USGS reports that an unknown quantity of asbestos is also imported into the United States each year in products that contain asbestos (e.g., brake linings for vehicles, knitted fire-resistant fabrics, rubber sheets for gasket manufacturing, and asbestos-cement pipe). [22] Imported products made from talc, including makeup and crayons, have recently been shown to be contaminated with asbestos.[24]

Asbestos in homes and buildings: Millions of tons of asbestos remain in U.S. schools, homes, offices, industrial facilities, other buildings, and water distribution systems. Asbestos is unsafe in a friable form (when in a dry state, asbestos can be crumbled, pulverized, or reduced to small pieces).

Friable asbestos poses a risk when it is poorly managed in buildings or when buildings are demolished or renovated and asbestos-containing debris is disposed of. The U.S. Government Accountability Office estimated in 2011 that the number of individuals in the United States who are exposed to asbestos ranges from 27 million to 100 million.[25] More than three decades have passed since the federal government assessed the amount of friable asbestos-containing material in certain types of buildings, and it concluded that this material was pervasive in the building sector.[26]

In order to prevent exposure to asbestos, as well as appropriately manage the presence of existing asbestos, the public and risk managers need current information to ascertain where it is located, how much is present, how it is being managed, and its likely condition. Educational information and warnings about asbestos should always instruct individuals to contact a certified asbestos abatement contractor who has the training and expertise to identify asbestos and develop a comprehensive plan to prudently manage or remove and dispose of asbestos-containing material.

The most recent data from the U.S. Census Bureau's American Housing Survey indicate that 40% of the nation's 118 million housing units (47.2 million units) were built before 1970. [27] According to the Environmental Protection Agency (EPA), residential structures built before 1975 may contain significant amounts of asbestos, including in roof shingles, attic insulation, floor tiles, drywall joint compound, and insulation for water tanks, boilers, and wiring.[28,29] Housing built after 1975 also likely contains asbestos, although possibly in lesser amounts. Unhealthy and inadequate housing, including housing that contains

asbestos, disproportionately affects people of color, people with disabilities, and people with low incomes. In fact, African American households are twice as likely to live in substandard housing as White households, people with disabilities are 1.4 times more likely to have inadequate housing than those without a disability, and households with incomes below \$25,000 a year are four times more likely to live in unhealthy or inadequate housing than households with incomes of at least \$75,000.[30,31]

An estimated 1.3 million U.S. workers are potentially exposed to asbestos each year, primarily during renovation, demolition, and remediation activities.[32] Occupational health and safety standards dictate the manner in which asbestos-containing building materials are removed and disposed of, but these practices may not be adequately protective. The Occupational Safety and Health Administration (OSHA) and associated state agencies are underfunded and conduct only a few hundred inspections each year related to asbestos.[33] When inspections have occurred, OSHA has cited building owners and contractors for violating its asbestos standard while performing work in industrial facilities, health clinics, schools, homes, and other structures.[34–36] Investigations of improper handling and removal of asbestos-containing materials indicate that some firms intentionally recruit workers who are in precarious situations because of their immigration status, race, ethnicity, and/or economic standing. These individuals are vulnerable to labor abuse, including exposure to health and safety hazards.[37,38] In addition, not all workers are covered by OSHA standards, including 8 million public-sector employees as well as the self-employed. Those who live in asbestos-containing homes and apartments can be exposed to the carcinogen during do-it-yourself renovations or repairs, through poor management practices by building owners or work conducted by disreputable or untrained contractors, or via extreme weather events.

Emergency responders are also at serious risk of developing asbestos-related disease, due in part to exposures during building fires and structural collapses following tornadoes, hurricanes, and other extreme weather events. The incidence of mesothelioma among firefighters is twice as high as that in the U.S. population as a whole.[39]

Asbestos in school buildings: More than 55 million children and 6 million adults spend a substantial part of each day in our nation's public and private school buildings.[40] The average age of U.S. public schools is 44 years, and many school buildings were constructed in the mid-1970s.[41] In 1986, approximately a decade after many of these schools were built, Congress passed the Asbestos Hazard Emergency Response Act (AHERA) to ensure that schoolchildren, teachers, maintenance personnel, and other staff would be protected from asbestos exposure. Children are uniquely vulnerable to environmental hazards as a result of their developmental status, unique behaviors and traits, and immediate surroundings. Lack of resources and inadequate protection from environmental hazards disproportionately affect children of color and the poor.[42]

A 2018 investigation by the EPA's Office of the Inspector General (OIG) revealed significant deficiencies in compliance with and enforcement of AHERA requirements. The OIG also reported that the EPA was inappropriately using AHERA-designated funds for other purposes. One consequence is that the EPA conducted only 13% of AHERA inspections within its jurisdiction. The OIG concluded that, as a result of failures in the AHERA, the EPA cannot verify that local educational agencies are identifying and properly managing asbestos in schools.[43]

Additional sources of asbestos: Asbestos is a naturally occurring silicate mineral that can often be found in close proximity to other silicate minerals in the Earth's crust. As a consequence, asbestos fibers can reside in proximity to talc, vermiculite, taconite, and other silicates.

Talc is commonly used in pharmaceuticals, toys, and cosmetic products, while vermiculite has been used for attic insulation and in some consumer products. Several product screening investigations carried out by independent testing laboratories have identified asbestos-contaminated talc in children's makeup and toys.[24] U.S. Senator Patty Murray is investigating the extent to which Johnson & Johnson had evidence about the presence of asbestos in its talc-based baby powder and failed to disclose this information to the public. [44] The U.S. Food and Drug Administration has alerted talc mining operations of the risk of asbestos contamination in their products and the potential risk to consumers of exposure to the carcinogen.[45] Mining of asbestos-contaminated vermiculite in Libby, Montana, resulted in an epidemic of asbestos-related disease in that community, and output from the mine is estimated to be installed as insulation in an estimated 15 to 30 million homes.[46]

To summarize, asbestos is a potent carcinogen that causes an estimated 255,000 deaths globally each year, including nearly 40,000 in the United States. Millions of tons of asbestos were used in U.S. homes, schools, and buildings from 1900 to the mid-1980s, but there is little reliable information about where it is located in order to guide risk management decisions. In addition to the hazard of existing asbestos, the U.S. chlor-alkali industry continues to import hundreds of metric tons each year, despite the availability of safer processes that do not involve asbestos, and asbestos-containing products continue to be imported for a variety of uses. The World Health Organization and other authoritative public health bodies conclude that there is no safe level of exposure to asbestos and that eliminating asbestos-related disease requires a global ban.

Evidence-Based Strategies to Address the Problem

Asbestos Hazard Emergency Response Act: The AHERA required all public and private nonprofit schools to conduct an initial inspection to identify any asbestos-containing materials. Schools with these materials are required to inspect their buildings every 3 years

to evaluate the condition of the materials. Institutions (or applicable local education agencies) are required to develop written asbestos management plans and engage in response actions to prevent or reduce asbestos hazards.

The AHERA was a well-crafted and forward-thinking law. Its authors recognized that nonfriable asbestos-containing materials in buildings would degrade with age and normal wear and tear. Materials that were not friable one year could become friable in the future, leading to the release of airborne asbestos fibers into the school environment and the community. The AHERA can play a critical role in protecting children attending schools built before 1986 from exposure to asbestos, as well as staff who work in these buildings. The law is not effective, however, if schools do not comply with the AHERA or if the EPA and state environmental agencies do not enforce the law.

Ban on asbestos imports and uses: In line with WHO's recommendations,[16,17] nearly 70 countries have adopted bans on asbestos. These bans are reflected in laws and regulations on mining, importing, manufacturing, processing, and distributing asbestos and/or asbestos-containing products. Adopting a comprehensive ban in the United States on all asbestos importation and use would ensure that no raw asbestos or asbestos-containing materials are brought into the country, including consumer products, toys, and products for industrial use. Complementing a ban would be enforcement, surveillance, sanctions, recalls, and warnings when an importer, user, or distributor violates the ban. With a ban in place, risk management activities can focus more on existing and potential sources of asbestos exposure from legacy use.

Manufacturers and other entities that previously used asbestos have identified or developed substitute materials. Some were motivated to do so in order to reduce their liability for asbestos-related disease. The chlor-alkali industry outside of the United States has converted nearly all of its production of chlorine and sodium hydroxide from a process that required asbestos-containing diaphragms to one that uses asbestos-free membranes. [47] Many chlor-alkali plants in the United States have converted to a non-asbestos production process; however, 15 U.S. plants, representing 45% of domestic chlorine output, continue to import and use raw asbestos.[48]

Protections from exposure to asbestos in homes, schools, and buildings: Various government agencies have used their regulatory authority to address the health hazards of asbestos, including the EPA, the Occupational Safety and Health Administration (OSHA), and the Consumer Product Safety Commission (CPSC). In 1973, the EPA banned spray-applied asbestos-containing materials for fireproofing and insulation purposes. In 1975, the agency banned installation of asbestos pipe and block insulation in facility components. The CPSC banned the use of asbestos in artificial fireplace embers and wall-patching compounds in 1977, and the EPA banned spray-applied surfacing materials in 1978. In 1989, the EPA completed a 10-year study and announced a phase out of the use of asbestos as well as a ban on its use in products that did not contain asbestos prior to the ban. Some

producers and users of asbestos filed a legal challenge to the EPA regulation that instituted the ban. The Fifth Circuit Court of Appeals overturned the EPA regulation on a matter unrelated to the dangers of asbestos. Following the court's decision, the EPA did not commence any other rulemakings to ban other toxic substances. In 1990, the agency banned spray-on application of materials containing more than 1% asbestos by weight in buildings, structures, pipes, and conduits unless certain conditions were specified. The United States, however, has not banned other uses of asbestos, including for adhesives, roof and non-roof coatings, separators in fuel cells and batteries, vinyl asbestos floor tile, and other building materials.

OSHA and the EPA have standards that address occupational asbestos exposures. Under the AHERA, the EPA promulgated regulations requiring local educational agencies to inspect their school buildings for asbestos-containing building materials, prepare asbestos management plans, and perform asbestos response actions to prevent or reduce hazards. In addition, the EPA was tasked with developing a model plan for states to accredit individuals conducting asbestos inspections and corrective-action activities at schools.

The OSHA asbestos standard mandates that employers comply with safe work practices and a permissible exposure limit and provide training and medical monitoring. It reduces but does not eliminate workers' risk of cancer because OSHA regulations are based on technological and economic feasibility. As a result, despite the OSHA standard, an estimated five excess lung cancer deaths per 1,000 exposed workers and two deaths from asbestosis per 1,000 are expected to occur from a working lifetime at the permissible exposure limit.[49]

States are responsible for implementing and enforcing EPA asbestos standards such as the National Emission Standards for Hazardous Air Pollutants, which cover potential asbestos exposures during demolition, renovation and disposal, and licensing programs for asbestos abatement contractors. Some states and localities have adopted additional mandates (e.g., public notifications for abatement projects) and offer consultation and training programs.

Medical monitoring programs have revealed reductions in asbestos-related diseases among the most highly exposed workers, specifically asbestos insulators and workers in the sheet metal trades. The early detection lung cancer screening program offered by the International Association of Heat and Frost Insulators and Allied Workers (AWIU), Local 17, in Chicago showed a reduction in asbestos-related pleural disease over the period since the implementation of the OSHA standard. In the 1960s, 94% of Local 17 members who entered the trade were diagnosed with this illness. This figure dropped to 75% in the 1970s and 47% in the 1980s.[50] Similar results have been seen in the Sheet Metal Occupational Health Institute Trust screening program, with a decrease in the number of parenchymal or pleural abnormalities among workers who entered the trade after 1970.[51]

Despite the progress made, asbestos-related death and disease continues to be an urgent public health problem. This is evident from the broadening of the AWIU program's medical screening criteria to all members who have a potential of 20 years of exposure to asbestos. Preliminary results of the program (December 2014 to April 2016) show that nearly 60% of screened insulators who started in the trades in the 1980s had confirmed or conditional asbestos-related pleural disease.[50] This finding confirms that even though no asbestos-containing thermal insulation was applied after these workers started their tenure in the construction trades, there remained substantial asbestos exposures from preexisting sources. When laws and regulations are not diligently enforced and companies are not held accountable when they fail to comply with these laws and regulations, asbestos exposures and resulting diseases occur.

Asbestos-containing building materials, including in homes, schools, industries, and infrastructure, are a significant source of exposure to asbestos in the United States. The risk is poorly addressed by a patchwork of laws, inadequate data, a general lack of awareness, and fragmented responsibility among government agencies. In contrast, the Commonwealth of Australia is addressing asbestos in the built environment through its National Strategic Plan for Asbestos Management and Awareness, which is administered by the country's Asbestos Safety and Eradication Agency. A similar comprehensive approach in the United States would enhance protections.

Opposing Arguments/Evidence

In 1989, the EPA issued a rule pursuant to the Toxic Substances Control Act (TSCA) to prohibit the manufacture, importation, processing, and distribution of asbestos. Some producers and users of asbestos filed a legal challenge to the rule. As noted, the Fifth Circuit Court of Appeals overturned the asbestos ban in 1991 on a matter unrelated to the dangers of asbestos, and the EPA did not engage in further rulemakings to ban other toxic substances. In 2016, Congress passed amendments to the TSCA, including provisions facilitating a ban on asbestos. The EPA, however, has taken steps that signal its unwillingness to fully address asbestos risks in communities and among vulnerable populations, including a reluctance to unconditionally ban phased-out products or to use the TSCA to improve protections against exposures to legacy products in the built environment.[52]

In the United States, the primary argument against a ban on asbestos is made by the chlor-alkali industry, which uses an electrolysis process with diaphragm, mercury, or membrane cells to produce chlorine and caustic soda by decomposing brine (salt water). An estimated 45% of the chlor-alkali capacity in the United States still involves asbestos diaphragm technology.[48] According to the U.S. Geological Survey, the chlor-alkali industry is

responsible for nearly all new asbestos consumption. In 2018, the industry imported an estimated 750 metric tons of raw asbestos.[22] The industry maintains that asbestos can be used safely in its facilities if operators follow OSHA standards and best practices guidelines.

Relying on OSHA standards and other safe-handling procedures, however, is insufficient given that authoritative public health bodies conclude that the appropriate way to eliminate asbestos-related diseases is to stop using all types of asbestos.[17,18] Continued use of asbestos cannot be justified in light of the availability of proven, safer substitutes for chlorine production.[47] Numerous opportunities for individuals to be exposed to asbestos exist in the chlor-alkali industry, including during mining operations, during shipment over land and through transportation ports, and at the plants where it is managed, used, and later disposed of. Workers as well as bystanders can be exposed to asbestos during these activities. Exposures can occur, for example, when bags containing asbestos are torn or otherwise damaged during loading, shipping and unloading. Workers can also be exposed when bags are weighed and dumped into a tank for mixing with water, even if the process involves functioning local exhaust ventilation or takes place in an enclosure. Eventually, asbestos-containing waste from chlor-alkali plants is removed and transported by workers and handled downstream as regulated hazardous waste. Along the entire supply chain, from mining and shipping to use and disposal, workers and communities are at risk of exposure. Moreover, asbestos use in occupational settings can lead to para-occupational exposures among family and community members. In addition, even if an employer ensures that its safe handling practices are followed with precision, OSHA's permissible exposure limit for asbestos is not adequate to protect workers from developing cancer. OSHA estimates that seven in 1,000 workers will develop cancer over their working lifetime at the current permissible exposure limit because the agency is required to adopt standards that are economically and technologically feasible.[53]

The chlor-alkali industry continues to lobby lawmakers and regulators to preserve its ability to import and use asbestos.[54] The industry, in addition to asserting that it can safely use asbestos despite determinations by authoritative public health bodies to the contrary, argues that asbestos is necessary to maintain the supply of chlorine. However, chlor-alkali manufacturers both inside and outside the United States have replaced asbestos diaphragms with safer processes. Over the past 30 to 40 years, virtually all chlor-alkali units built worldwide have incorporated membrane cell technology, which involves neither asbestos nor mercury and is more energy efficient.

Action Steps

APHA urges that:

1. Congress pass legislation banning all importation, manufacture, processing, and distribution in commerce of asbestos and asbestos-containing products (i.e., products to which asbestos is intentionally added or products in which asbestos is a contaminant).

The ban should also apply to products in which there is asbestos contamination of ingredient minerals (e.g., talc, vermiculite).

2. Congress direct the EPA, in consultation with the secretary of health and human services and the secretary of labor, to investigate and make an estimate of the prevalence of asbestos in residential, commercial, industrial, and public buildings; all public and private school buildings; and all Head Start and licensed child-care facilities. The assessment should estimate the total number of people exposed to asbestos, evaluate the condition of the asbestos and how it is managed, and recommend improvements in policies and practices to reduce risks. It should be designed to capture the risk of asbestos exposure among vulnerable populations, including people of color, people with disabilities, people with low incomes, and other underserved communities.
3. EPA strengthen enforcement of the AHERA inspection certification process and other compliance and enforcement deficiencies, reiterate to local educational agencies the requirement for asbestos management plans, incorporate asbestos as a priority hazard in monitoring of compliance with federal environmental laws, and provide additional federal grant support to states for AHERA oversight in schools.
4. Until an asbestos ban is implemented in the United States, EPA use its authority under the TSCA to require any person or entity that imports, manufactures, processes, or distributes asbestos or asbestos-containing materials to make a public disclosure of the amount, its port of entry, route of distribution, use, and potential for exposure.
5. The U.S. surgeon general make an annual warning to educate the public about asbestos and encourage relevant federal, state, and local agencies and consumer, labor, and environmental organizations to publicize the warning and ensure that it reaches underserved communities.

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