

Review

Asbestos and cancer in Latin America and the Caribbean: we may have won some battles, but definitely not the war

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Abstract

Only six countries have banned the industrial use of asbestos in Latin America and the Caribbean. In fact, the industrial use of asbestos appears to be growing in this region. Asbestos is one of the most dangerous natural substances in the world, it is contained in several types of rocks (such as serpentinites, mafic and ultramafic rocks) but fibers can be released to the atmosphere both by natural and anthropogenic sources. Six countries have banned the industrial use of asbestos in this region, we expected that laws established before 2007 would be less adherent to the 2007 WHO/ILO recommendations. In contrast, the Chilean law of 2001 is one of those that most adheres to international recommendations along with the Colombian law of 2021. Which means that the newest laws are not necessarily the strongest. This article aims to draw a regional overview of the laws against asbestos production in Latin America and the Caribbean, highlighting the strengths and weaknesses of each national policy. We recommend that countries that have already banned asbestos consider updating and strengthening their existing laws and develop clinical guidelines for the management, monitoring, and rehabilitation of asbestos-related diseases. The challenge of asbestos goes far beyond a prohibition law.

Introduction

Asbestos is made up of a group of fibrous materials used in construction and other industries due to its chemical properties and low price. In addition to the environmental damage caused by the process of extraction and production of the material, exposure to asbestos is a known cause of occupational health diseases, including pleural mesothelioma, which causes thousands of deaths worldwide, 26.278 in 2020 with a mortality crude rate 0.4 per 100.000.^{1,2} Since asbestos is classified as carcinogenic to humans by the international agency for research on cancer,³ many international efforts have been made in recent decades to ban the production of asbestos, requiring healthcare workers, policy makers, and other stakeholders to work together across the globe. As a result of this multilateral approach to the problem, the industrial use of asbestos has so far been banned in more than 67 countries.⁴ The World Health Organization (WHO) in association with the

International Labor Organization (ILO) established the broad lines of programs to eliminate asbestos-related diseases in 2007.⁵ Despite the WHO in association with the ILO established the broad lines of programs to eliminate asbestos-related diseases in 2007,⁵ about 125 million people are exposed to asbestos in the workplace worldwide.⁶

Only six countries have banned the industrial use of asbestos in Latin America and the Caribbean, and not all have banned its production throughout the national territory. In fact, the industrial use of asbestos appears to be growing in this region. This raises concerns about the impact of international directives in this region and the expected long-term benefit of current interventions. This article aims to draw a regional overview of the laws against asbestos production in Latin America and the Caribbean, highlighting the strengths and weaknesses of each national policy, to identify barriers and opportunities for improvement of each one. We strongly believe that this document will also help raise awareness among policy makers, healthcare providers and physicians living in countries that have not established a national ban on asbestos.

Asbestos

Asbestos can be defined as a group of natural minerals, known since ancient times; multiple historical references show it.⁷ Asbestos are silicates of iron, sodium, magnesium, and calcium, with a crystalline structure, made up of very fine microscopic fibers in the shape of a needle or measures that reach a length greater than 5 microns, diameter less than 3 microns and a length/diameter ratio greater than 3.⁸ Among its characteristics we have a remarkable durability, resistance to traction and flexibility, resistance to heat, wear, alkalis, and acids; Value-conferring properties in a wide range of products, including pipe and building insulation, friction products including brake shoes, and fire-resistant bricks.⁹ It has been woven in fire retardant fabric and incorporated into erosion resistant cement tiles. The physical, chemical, and mineralogical properties have contributed to making asbestos one of the most suitable and useful materials.⁸ But at the same time, one of the most dangerous natural substances in the world, being naturally contained in the rocks it can be released to the

Significance for public health

The use and exposure of asbestos has historically caused human suffering and still represents a global public health issue. Asbestos-related disease includes asbestosis, lung cancer, malignant mesothelioma which results in innumerable disability, associated societal costs and deaths. The lag time between exposure and the development of disease may be up to 3 decades, thus the follow up of vulnerable population should be considered a public health objective to prevent these diseases. Over 67 countries in the world have adopted a national ban on asbestos; but in Latin America only 6. This paper describes several aspects of actual policies, focusing both on regulatory aspects and monitoring strategies. We encourage to keep working together government, workers, industry advocates, environmentalists, clinicians, scientists, and consumers; to diminish the impact of this preventable disease, an important public health matter.

ambient atmosphere, the hydrosphere, in the soil of many areas and accumulate in the lung tissues after occupational exposure.¹⁰

To date asbestos had proved dangerous for humans only if inhaled.¹⁰ Nevertheless, due to their small size and low density, asbestos fibers can be transported quickly through wind and water and penetrate a variety of ecosystems.^{8,9} Precipitation acts as a collector and introduces fibers into the water cycle, strengthening its polluting potential. Streams and groundwater in contact with asbestos-containing bedrock are also an important source of asbestos fibers in the natural environment. In addition, the common use of fiber cement pipes to transport drinking water increases the concentration of this mineral, making it a potential polluting factor for humans in urban areas.

Although the effect of asbestos on marine life still requires more research, studies so far have shown its ability to accumulate in algae (or phytoplankton), a primary source of the food chain.⁸ The alteration of aquatic environments on their primary scale could affect consumers at all trophic levels, including herbivores and carnivores. In addition to this negative impact, asbestos-rich soils provide unfavorable environments for the growth of vegetation, harboring limited plant species and generating a decrease in ecosystem diversity, including animal diversity. Said vegetation is subjected to a significant level of stress, which entails a delay in its growth, alterations in the color and development of its roots.

We have also used asbestos in cities as a material for the construction of roads, railways, foundations, and other engineering purposes. The transport of these materials generates asbestos dust that can reach dangerous levels for the health of the population.⁸ It is also known that for every ton of asbestos fiber produced twenty tons of asbestos waste is generated, but we do not know how to handle this waste in the mines of Colombia and Latin America.

Asbestos has been a fundamental pillar for the industrial growth of many nations, especially in developing countries with limited financial resources. Its great attractiveness is due to its durability, versatility, cost-effectiveness, and unrefined technology requirements. This was compounded by the paucity of health-related information about the risk of its exposure. It was not until the 1950s and early 1960s that the British first raised awareness of a direct relationship between the manipulation of this mineral and respiratory cancer diseases. By then, South America was beginning to boom in the world's asbestos market and its consumption was about 38,100 tons per year. By 1970 Brazil became the most influential South American producer and consumer of asbestos, and for 1980s the percentage of the world's total asbestos consumption was: Africa, 80%; Asia, 77%; Eastern Europe, 76%; South America, 76%; Oceania, 60%; North America, including the United States, 45%; and Western Europe, 43%. With the emergence of problems related to its use, worldwide consumption declined from 4.73 Mt in 1980 to about 2.11 Mt in 2003. Many companies have been forced to stop producing this mineral and many others have gone into bankruptcy.¹¹ Regardless, with the prohibitions and regulations, European countries began to buy asbestos in South American industries which exponentially increased the production in this region in the last 30 years.¹²

There are two major groups of asbestos: serpentines and amphiboles, the latter are the most fibrogenic and carcinogenic. Various pulmonary and extrapulmonary pathologies can be caused by this type of fibers. Among the pulmonary ones, we emphasize pleural effusion, pleural plaques, diffuse pleural thickening, asbestosis, rounded atelectasis, lung carcinoma and mesothelioma.

Asbestosis is a diffuse interstitial pulmonary fibrosis that occurs especially in patients with a clinical history of high levels of exposure over long periods of time, and it involves a process of

accumulation of inhaled particles that react with the lung's tissue. At histopathologic analysis, asbestos bodies can be identified in intra-alveolar macrophages. It presents with similar clinical and radiological features as other forms diffuse interstitial pulmonary fibrosis. The imaging approach with chest radiography can reveal small irregular opacities with a fine reticular pattern and may be associated with pleural thickening or plaques, however there are no known pathognomonic findings of asbestosis in this exam. The detection of parietal pleural thickening in the CT scan along with lung fibrosis is highly suggestive of asbestos-induced pulmonary fibrosis and can be very useful in differentiating it from idiopathic pulmonary fibrosis.^{13,14}

All forms of asbestos can cause asbestosis, a chronic and irreversible pneumoconiosis. Furthermore, they have been shown to be carcinogenic to humans.¹⁵ Exposure to these fibers, especially occupational exposure, results in an increased incidence of mesothelioma and cancers of the lung, larynx, and ovary and has shown a limited association with cancers of the pharynx, stomach, and colorectal.⁴ Due to the long latencies of asbestos-related diseases,¹⁶ the consequences of asbestos exposure can be observed even after 30-40 years and still represent a relevant issue in countries where asbestos was mined during the last century.¹⁷ Monitoring the vulnerable population should be considered a public health objective to prevent these diseases.

Asbestos and malignant pleural mesothelioma (MPM)

The data available on MPM are considered a reflex of a sentinel event indicating the effects of asbestos exposure. The highest mesothelioma incidence rates are reported from some countries in Europe (UK, The Netherlands, Malta, Belgium) and in Oceania (Australia, New Zealand). Countries with intermediate incidence rates includes Finland, Norway, Sweden, Denmark, Iceland, Germany, France, Italy, Austria, and the United States. Some other countries lack of information, inducing an underestimation of mesothelioma incidence.¹⁵ It is remarkable to mention that inside a given country, MPM incidence shows huge variations from one area to another. Generally, these areas are or have been the site of asbestos mines, or asbestos industries in which asbestos was largely employed (mainly shipyards and asbestos-cement factories).

MPM have a poor prognosis with a 5-year relative survival of 10%, because up to 65% of cases are diagnosed at an advanced stage.¹⁸ The exact mechanism by which asbestos causes MPM is unknown. Nevertheless, some models could explain the carcinogenesis of asbestos: i) DNA damage induced by reactive oxygen species produced by asbestos fibers results in genetic instability and leads to the development of cancer. ii) Once inside mesothelial cells, asbestos fibers induce cell cycle disorders that produce chromosomal abnormalities. iii) Asbestos fibers can interfere with the normal function of proteins associated with the cell cycle, causing cell damage and dysregulation of the cell cycle. iv) After interaction with asbestos fibers, mesothelial cells could release growth factors and pro-inflammatory cytokines that induce cell proliferation and survival.¹⁹ Regardless, nearly 80% of MPM patients have a history of previous asbestos exposure, making the causal link between asbestos and MPM highly relevant.

Treatment of MPM depends on the stage of the disease at the time of diagnosis. For the local stages, surgery remains the standard treatment. Instead, locoregional disease may require multimodal therapy including induction chemotherapy, surgery, and adjuvant radiation therapy. Stage IV disease represents a great challenge for the oncologist. For many years, cisplatin 75 mg/m²

plus pemetrexed 500 mg/m² given every 3 weeks has been the preferred first-line chemotherapy. In a phase 3 trial, the combination was superior to cisplatin alone with an overall survival of 12.1 *versus* 9.3 months and the toxicity was acceptable.²⁰ Unfortunately, although the patient responds to this treatment initially, almost everyone will have disease progression. So, immunotherapy was the natural option to explore in clinical trials for MPM, due to its excellent results in other types of cancer. In fact, the combination of nivolumab plus ipilimumab showed a better overall survival of 18.1 *versus* 14.1 months compared to cisplatin/carboplatin plus pemetrexed in a phase III trial, becoming the new standard of treatment for unresectable MPM.²¹ Additionally, there are some ongoing trials testing pembrolizumab, durvalumab, and atezolizumab alone or in combination therapy for MPM.²²⁻²⁴ At this point, it is important to say that immunotherapy is not available in all countries. For this reason, platinum-based chemotherapy remains the most widely used treatment overall. Interestingly, about 2.4% of MPMs have microsatellite instability (MSI).²⁵ The identification of high MSI tumors is clinically relevant, especially since the FDA approved the use of pembrolizumab for all types of high MSI solid tumors, which means that pembrolizumab could be another treatment option to consider in this population specific.

Regional overview of the laws against asbestos production in Latin America and the Caribbean

Since 1972, many countries have banned the use of asbestos, but it is still mined in developing countries. With the aim of reducing the health impact related to asbestos, in 2007 the WHO, in collaboration with the ILO and other intergovernmental organizations and civil society, has provided a series of recommendations.²⁶ Among those who highlight the importance of stopping the use of all varieties of asbestos. Most countries provide information on solutions to replace asbestos with safer substitutes and develop economic and technological mechanisms to stimulate its replacement; take steps to prevent asbestos exposure on site and during removal; improve early diagnosis, treatment, and rehabilitation services; establish records of people with past and/or current exposures and organize medical surveillance of exposed workers. Finally, it is critical that countries provide information on the hazards associated with asbestos-containing materials and products and create awareness that asbestos-containing wastes should be treated as hazardous waste.²

Now we will expose the laws that some Latin American countries have implemented to mitigate this situation, and we will analyze whether these laws adhere to the 2007 WHO/ILO recommendations to for the Development of National Programmes for Elimination of Asbestos-Related Diseases according to the information available on the Internet (Table 1).

Asbestos in Argentina, Chile, Uruguay, and Honduras: the first steps Argentina

In 1997, Argentina considered asbestos as a priority within its National Plan for the Rational Management of Chemical Substances, and was the subject of analysis by a technical working group on carcinogenic substances, in addition to public meetings in which the government, the workers, representatives of the industry, universities, environmentalists, scientists and consumers, it was agreed that exposure to asbestos constitutes a risk factor for both workers and the general population and that this country must provide citizens with the same protections adopted by many developed countries.²⁷ In 2000, Argentina became the first country in Latin America to ban the use of asbestos (Resolution 845), specifically amphiboles. One year later, through Resolution 823 of 2001, the production, import, commercialization and use of chrysotile variety asbestos fibers and products that contain them are prohibited, as of January 1, 2003.^{27,28}

Chile

The Chilean Ministry of Health, through Supreme Decree 656 of January 13, 2001, totally prohibits the production, import, distribution, sale and use of all types of asbestos and any material or product that contains it.²⁸ It should be noted that article 5 of Decree 656 establishes that: The Health Authority may authorize the use of asbestos in the manufacture of products or elements that are not construction materials, provided that the interested parties demonstrate that there is no technical or economic feasibility that allows to replace it with another material.²⁹ Though, this can only be done if strict hygiene and safety measures are maintained in the workplace, which will be, in each case, indicated and expressly authorized by the competent Health Service, an entity that will verify that the risks to the health of workers have been controlled (Article 6).

Table 1. Regional overview of laws against asbestos production in Latin America and the Caribbean. Do they adhere to the 2007 WHO/ILO recommendations?

Adherent to WHO/ILO recommendations	Countries who have banned asbestos production					
	Argentina 2000	Chile 2001	Uruguay 2002	Honduras 2004	Brazil 2017	Colombia 2021
National Asbestos Profile	X	X	X	X	X	✓
National Asbestos Work Plan	X	X	X	X	X	✓
Follows ILO convention N°162 recommendation	✓	✓	✓	-	-	✓
Registry of workers exposed to asbestos	X	X	X	X	-	✓
Preventing strategies for exposed workers	✓	✓	✓	-	✓	✓
Strategic actions to replace asbestos with safer substitute	X	✓	✓	X	✓	✓
Economic strategies to cover the cost of asbestos elimination process	X	X	X	X	X	X
Monitoring and evaluation strategy	-	-	-	-	-	✓
Apply all over the country	✓	✓	✓	✓	X*	✓

-, no information available; *the Federal Supreme Court (STF) decided the total abolition of the use of asbestos in all Brazilian states.

Uruguay

Through the implementation of Decree 154 of May 7, 2002, Uruguay restricts the manufacture, import and commercialization of asbestos or products that contain it.³⁰ Specifically, it is established that the manufacture, introduction into the national territory in any form and the commercialization of products containing asbestos included in heading 6811 and in item 6812.50.00.00 of the NCM (Common Mercosur Nomenclature) is prohibited. For the manufacture, introduction to the national territory in any form and commercialization of the rest of the products that contain asbestos, a special authorization must be requested from the Ministry of Public Health.³⁰ To obtain this authorization, the manufacturer, introducer, or trader must submit technical reports that indicate the characteristics of the products or elements to be introduced into the country to manufacture or market, the types of asbestos or asbestos that will be used, the measures that must be adopted, to control health risks, how waste will be disposed of and justification that it is not possible to replace asbestos with other types of materials.³¹

Honduras

Honduras, for its part, through Agreement No. 32-94 of January 16, 2004, implemented a provision that prohibits the use of products containing chrysotile, anthophyllite, actinolite, amosite and crocidolite, as well as their import, manufacture, distribution, marketing, transportation, and storage, excluding thermal or electrical insulation of household appliances, electronic equipment, and personal fire protection equipment.²⁸

Asbestos in Brazil: Strong steps. There is still controversy

The Law 9,055 of June 1, 1995, prohibits throughout the national territory the extraction, production, industrialization, use and sale of actinolite, amosite, anthophyllite, crocidolite and tremolite, mineral varieties belonging to the group of amphiboles, as well as the products that contain them, mineral substances;

However, this law does not prohibit the use of asbestos (variety chrysotile, serpentine minerals), allowing its extraction, use and commercialization.³²

In 2007, through the Law 12.684 - updated to the Law No. 16.048, of December 10, 2015, Brazil prohibits in the State of São Paulo, the use of products, materials or devices that contain any type of asbestos (variety streamers and amphiboles), or any mixture containing one or more of these minerals.³³ On 01/29/2017, the Federal Supreme Court (STF) decided the total abolition of the use of asbestos in all Brazilian states. The National Confederation of Industrial Workers (CNTI) filed a direct action of unconstitutionality before the STF, arguing that, since Federal Law No. 9055/95 allowed the use of asbestos, several state regulations, including that of Rio de Janeiro, were invading the competence of the Union by imposing greater restrictions. The STF ministers did not accept the action, considering that the health of the worker is well protected constitutionally and is above any economic interest, for which the states are prohibited from adopting laws that liberate the use of asbestos. However, even today there is concern about the use of Chrysotile variety asbestos in the country, due to the permission contained in Law 9055/95. Since this country has been an important producer and importer of this mineral, widely used in the cement and fiber cement industry.³⁴

Asbestos in Colombia: a long way to prohibition

Asbestos production in Colombia began in 1940 and since then, this mineral has been used in the construction, automotive and textile industries.³⁵ For decades, Colombia positioned itself as one of the most important asbestos producing countries in the region, with mines located mainly in the Department of Antioquia. Starting in the eighties, after demonstrating the relationship between exposure to asbestos and the development of some lung diseases, several countries began to regulate and prohibit the use, exploitation, and commercialization of this material. On the contrary, in Colombia, the production and consumption of asbestos continued to be predominant. Since 2007, in Colombia, seven bills have been presented in the Congress of the Republic that seek to prohibit the use of asbestos without their approval being successful (Table 2). Even in 2010, one of the main chrysotile-type

Table 2. Bills for the prohibition of asbestos in Colombia. Adapted from: Observatorio de Redes y Acción Colectiva Universidad del Rosario. Asbesto ¿un peligro silencioso? Parte 2: Intentos de prohibición del uso de asbesto en Colombia. 2019; 50-54.

Date of abolition	Bill	Objective
January 2007	199/07 of the House of Representatives	"Establish and regulate the obligation to produce and supply social cement and sheets of asbestos coverage, as an input for the plans for the construction or improvement of low-income housing and as an incentive to promote low-income housing plans and programs managed by the State"
July 2007	35/07 Senate of the Republic	"Prohibit the use of asbestos, in all its forms, in the manufacture of all kinds of elements in the national territory"
July 2007	45/07 Senate of the Republic	"Adopt guidelines for the protection policy against asbestos in the national territory"
November 2007	177/07 Senate of the Republic	"Issue regulations on the prohibition of the use of asbestos in all its varieties and establish prevention, protection and surveillance measures against the risks derived from exposure to asbestos in the workplace and the environment in general"
May 2009	341/09 of the House of Representatives	"Establish and regulate the production and distribution of sheets of social cement and fiber cement for roofs"
September 2015	97/15 of the House of Representatives	"Prohibit the production, marketing, export, import and distribution of any variety of asbestos in Colombia"
July 2016	34/16 of the House of Representatives	"Prohibit the production, marketing, export, import and distribution of any variety of asbestos in Colombia"

asbestos-producing mines, Mina Las Brisas, located in Campamento, Antioquia, was reopened, with a production of around 700 tons of asbestos per month;³⁶ this probably explains the increase in national asbestos consumption from 20,000 to 25,200 tons between 2011 and 2012.³⁵ In response, different civil society groups tried to ban asbestos through different legislative means. This led to the prohibition of the use of asbestos in the municipality of El Colegio, Cundinamarca and in the Department of Boyacá throughout the first half of 2019. Finally, in June 2019, bill 061/17 was approved, which had been presented since August 2, 2017, by Senator Nadia Blel. This bill better known as “The Ana Cecilia Niño Law”, in honor of the social communicator and victim of exposure to asbestos who led the ban on the mineral in Colombia, aims to preserve life, health and the environment of the workers and of all the inhabitants of Colombia. The national territory against the risks posed by exposure to asbestos. This by prohibiting the exploitation, production, marketing, distribution, or export of any variety of asbestos throughout the national territory, as of January 1, 2021.^{36,37}

Likewise, the law establishes guarantees for exposed workers, through the creation of the National Commission for the Substitution of Asbestos, which must ensure effective compliance with the substitution of Asbestos; and prepare the Labor Adaptation and Productive Reconversion Plan with which it is intended to identify workers affected by exposure to asbestos, generate the necessary studies to monitor the health of these workers for a period of 20 years, and dictate measures that guarantee relocation of a job. For this, a term of 5 years was defined.³⁸

Peru, Paraguay, Bolivia, Venezuela, Panama, Costa Rica: On the way. Regulation is different from prohibition

According to the Pan American Health Organization (PAHO) asbestos atlas project there are some countries that are limited to addressing the management of asbestos in a safe way, without envisioning its ban. Peru, through the law 29662, prohibited the use of amphibole asbestos and indicated the demolition and removal of buildings, where due to the time of its construction it is presumed the existence of asbestos fiber insulation that could cause dispersion of asbestos fibers. Anyhow, it provided accreditation for the regulated use of chrysotile asbestos.³⁹ Paraguay, Bolivia, and Venezuela do not apply restrictions on its use, but it must have the endorsement of the Ministry of the Environment or Health; as well as complying with the laws that oblige employers to guarantee the safety and health of employees exposed to this mineral. For their part, countries such as Panama and Costa Rica have regulations that allow the controlled use of asbestos, ensuring the management and protection of personnel, without a clear guideline on prohibition.⁴⁰

Discussion

The negative impact of asbestos is irrefutable, and we probably still do not understand the enormous scale of damage that can result from its use. Currently, social, cultural, political, and environmental challenges must focus on the development of populations whose structures do not interfere with the inherent capacity of the earth to generate and sustain all kinds of life. For this, it is important to appreciate public health problems in their immense density and interconnection with other sciences.

Only six countries in Latin America and the Caribbean have legislation on the prohibition of asbestos. As common points, the laws prohibit all forms of asbestos throughout the national territory, except Brazil where it was initially banned only in the state of Sao Paulo, however the STF in 2017 decided the total abolition of the use of asbestos in all states Brazilians.³² The legislation of Argentina, Chile and Uruguay establishes guidelines based on ILO Convention 162 issued in 1986, which determines the measures to be adopted to prevent and control health risks due to occupational exposure to asbestos and protect its workers.⁴¹ In the information available on the legislation in Honduras and Brazil, there is no information that refers to adherence to ILO Convention 162.

As particular strengths of the laws on asbestos in Latin America, we highlight the establishment of guidelines that follow the model proposed by the WHO/ILO in terms of measures to prevent exposure to asbestos in place and during its removal, as well as the measures that it will be adopted to protect the health of workers and surrounding populations, the substitution of asbestos for safer products, the dangers associated with materials and products that contain asbestos, as well as the importance of proper management of the waste that contains this material. We also consider very important the presence of guidelines on the safe handling of structures with installed asbestos. The best examples are the “Technical Guide for the environmental management of asbestos waste and the products that contain them” from Colombia and the “Manual for the elaboration of a work plan with materials that contain friable and non-friable asbestos” from Chile. However, these documents focus primarily on structures that require demolition and do not provide an active strategy for removing existing structures. Another positive aspect to emphasize is the presence of certified private companies that provide safe asbestos removal services in the region, but the process can be very expensive, and none of the regional laws provide a concrete economic strategy to cover the cost of asbestos removal.

Surprisingly, we expected that laws established before 2007 would be less adherent to the 2007 WHO/ILO recommendations. In contrast, we find that the Chilean law of 2001 is one of those that most adheres to international recommendations along with the Colombian law of 2021. Which means that the newest laws are not necessarily the strongest.

In general, a common weakness of the legislation of Latin American countries is that they do not establish guidelines regarding the registration or identification of people with past and/or current exposures to asbestos, at risk of suffering diseases related to exposure to it. Likewise, none of them include limits on asbestos exposure within their guidelines. They all talk about gradual withdrawal, controlled use, restrictions on specific conditions or prohibitions. It would be recommended that countries that have not yet banned asbestos adopt measures such as those established by The Occupational Safety and Health Administration (OSHA) of the United States.⁴² These measures include protections such as the Permissible Exposure Limit (PEL) and the time weighted average (TWA) to ensure safe and healthful working conditions for workers from the hazards of asbestos.

On the other hand, despite the existence of very complete clinical guidelines, such as the Comprehensive Evidence-Based Care Guide for Pneumoconiosis (Silicosis, Pneumoconiosis and Asbestosis of the Coal Miner) 2006 (GATI-PNEUMO) and the National Plan for the Prevention of Silicosis, Pneumoconiosis and Asbestosis of the Coal Miner 2010-2030 (6.26) in Colombia,^{43,44} we found that a guide with concrete recommendations on medical surveillance, treatment or rehabilitation of these workers is lack-

ing. It should be noted that some documents such as the “norm of the use, management and disposal of asbestos and its wastes” in Argentina, established clinical tests and specific follow-up times for exposed workers, but even so, they do not include guidelines for treatment and rehabilitation in the document.

The Colombian Law was the last to come into force and therefore the most adherent to the WHO/ILO recommendation. Unfortunately, despite being the most complete initiative, it does not contemplate some important aspects that were proposed in the bills previously raised in the country, such as the cooperation of other countries, which have already implemented the ban on asbestos, which could provide advice and technical assistance to Colombia (Bill 45/07 of the Senate of the Republic).³⁶

After reviewing each law, we identified three aspects that we consider opportunities to improve these laws that should be considered now that these Laws have entered into force.

i) The participation of victims and workers in the National Commission for the Substitution of Asbestos should be considered; ii) Governments should start educational campaigns, to prevent people without the necessary knowledge and care from trying to remove these elements, considering that mishandling of asbestos already installed can cause the release of particles from it, thus increasing the risk of exposure; iii) As oncologists, we consider it vitally important that a longer period of health follow-up be considered for workers exposed to asbestos. This is because, as mentioned above, latency periods longer than 30 years have been documented for the development of pathologies secondary to asbestos exposure.¹ In Colombia, a 20-year follow-up period was established.

In addition, we also advise that countries that do not have an asbestos law become aware of the problem and draw on the experience of those countries that already have it, because, as we already explained, there is a long way to go to reach the goal. The resistance of the asbestos industry is guaranteed and regional problems such as insecurity, low health coverage, unemployment and poverty hinder any initiative in general. In this context, we recognize that our research is limited, as it cannot conclude whether the existing laws in the region are having the expected impact in each country. The introduction of epidemiological surveillance systems, such as the mesothelioma registry,⁴⁵ would help to evaluate public health policies on the prevention of asbestos-related diseases in the long period. International collaborations with public health institution that already manage these tools could be useful to increase the awareness about the actual consequences of asbestos exposure.

Conclusions

As of the date of this publication, the production and commercialization of asbestos continues in most of the countries of Latin America and the Caribbean. Only six countries have banned the production of asbestos so far. Although other countries have regulated the use of asbestos. After reviewing each law, we concluded that the newest laws against Asbestos are not necessarily the strongest. Therefore, we recommend that countries that have already banned asbestos consider updating and strengthening their existing laws and develop clinical guidelines for the management, monitoring, and rehabilitation of asbestos-related diseases. Finally, we congratulate the pioneering countries in this initiative, which are setting an example for the rest of the region. However, in our opinion, the challenge of asbestos goes far beyond a prohibition law and requires motivated governments working together with motivated doctors and motivated societies on different levels to solve it.

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