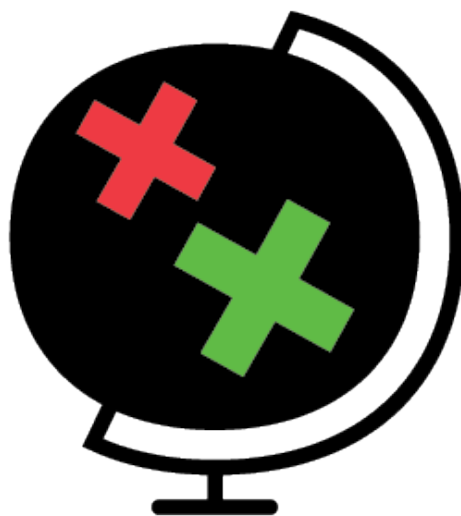


# FACTS ABOUT CHRYBOTILE ASBESTOS

HUMAN HEALTH TRAGEDY & ECONOMIC DISASTER

An Information Resource for Policy Dialogue



PREPARED BY

**Union Aid Abroad APHEDA**

The global justice organisation of the Australian union movement



# CONTENTS

Preface	2
What is chrysotile asbestos and what products is it used in?	3
Why is chrysotile asbestos a problem for human health and who is most at risk?	3
How big is the health impact globally of asbestos?	5
Which countries are still producing, using and trading in it?	6
Which countries have banned asbestos?	7
Does banning asbestos conflict with trade rules under the WTO?	7
Asbestos is not a 'cheap' building material and transitioning to non-asbestos alternatives is possible without negatively affecting the economy	7
Can asbestos be 'used safely' as stated by asbestos exporting countries and some asbestos using companies?	9
Chrysotile asbestos and the Rotterdam Convention	10
Lobbying and misinformation from the chrysotile asbestos industry	10
Evidence from Australia regarding chrysotile asbestos	11
How can countries eliminate asbestos related diseases?	12
References and End Notes	13

# PREFACE

I have much pleasure in commending this important resource on chrysotile asbestos.

The Australian Asbestos Safety and Eradication Agency was established on 1 July 2013 to provide a national focus on asbestos issues which goes beyond workplace safety to encompass environmental and public health concerns.

Our experience has shown how important it is to have a reliable and robust evidence-base to tackle the elimination of asbestos-related disease in Australia. This journey commenced in 2010 with the Asbestos Management Review whose report in 2012 led to the establishment of a stand-alone agency to coordinate all aspects of asbestos safety and eradication in Australia.

Since 2003, the Australian Government has prohibited the importation of goods that contain all types of asbestos.

Exposure to asbestos remains a serious problem for Australia – for all our governments, local, state and national, for our health care sector and more importantly for the families of asbestos-related disease sufferers who live with the consequences of exposure every day of their lives. The latest estimate of asbestos disease burden in Australia remains at 4,000 deaths per year.

The *National Strategic Plan for Asbestos Management and Awareness 2014-18* has provided Australia with the evidence-base across six strategies to now move onto the next more proactive phase of the plan.

We are aware of attempts by some in the asbestos industry to misinform governments and policy makers in Asia and elsewhere about the toxic nature of chrysotile asbestos and attempting to place disease blame on other types of asbestos. This is completely untrue and should not be allowed to delay important action on stopping the use of chrysotile asbestos by any country.

Australia will continue to be an international voice in the global campaign against asbestos hazards and against the continuing use of all types of asbestos – something this factual resource on chrysotile asbestos adds to significantly.



Peter Tighe  
Chief Executive Officer

Australian Government Asbestos Safety  
and Eradication Agency



## What is chrysotile asbestos and what products is it used in?

Asbestos is a naturally occurring silicate mineral fibre. Chrysotile asbestos, or white asbestos, is one of 6 types of asbestos. Chrysotile asbestos is the only form of asbestos still mined and traded commercially. It has constituted 95% of all asbestos marketed over the past century.<sup>1</sup> Chrysotile asbestos has been used in the past for a wide range of products including within the construction industry, automotive and textile industries. These uses continue in some countries today.

For countries that have not yet banned asbestos and asbestos containing products, the most common products that may contain asbestos include:

Construction material - Asbestos Cement  
Roofing materials (corrugated and flat sheet) –  
Siding and flooring – Asbestos Cement Pipes

Friction material - Car brake pads and clutch linings – Insulation for ducts, pipes, tanks –  
Gaskets

Adhesive and sealant materials - Fire hoses, heat resistant gloves, electrical wire cover, etc.

## Why is chrysotile asbestos a problem for human health and who is most at risk?

It's a problem because chrysotile asbestos exposure causes a range of cancers and other diseases in humans. Exposure occurs primarily through breathing the microscopic fibres into the lungs.

Chrysotile asbestos is the leading cause of asbestos related diseases (ARD's) in the world today. Asbestos exposure accounts for nearly half of the total burden of all occupationally caused carcinogens.<sup>2</sup> Chrysotile asbestos has the same carcinogenic properties no matter which country it is from.

For many decades, scientific evidence has been clear that exposure to any asbestos fibres in the home or in the workplace or outdoor environment can cause asbestosis, lung cancer, mesothelioma and cancers of the larynx and ovary.<sup>3</sup> The WHO is clear that there is no safe level of exposure.

'There is no evidence of a threshold for the carcinogenic effect of both chrysotile and amphibole forms of asbestos and that increased cancer risks have been observed in populations exposed to very low levels, the most efficient way to eliminate asbestos-related diseases is to stop using all types of asbestos.'<sup>4</sup>

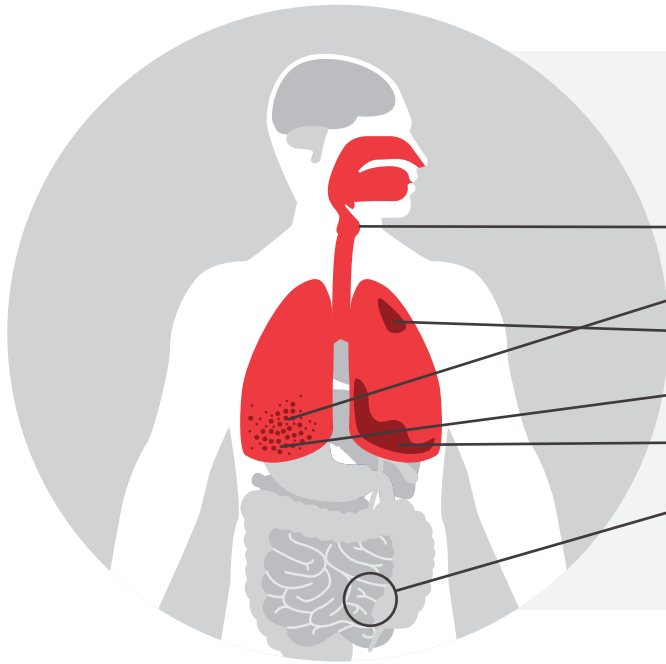
The international evidence on the direct link between exposure to chrysotile asbestos and a range of cancers is overwhelming and well documented by the International Agency for Research on Cancer.<sup>5</sup>

'There is sufficient evidence in humans for the carcinogenicity of all forms of asbestos (chrysotile, crocidolite, amosite, tremolite, actinolite and anthophyllite)'

- IARC Monographs on Asbestos<sup>6</sup>

Those most at risk from deadly asbestos exposures are workers engaged in the process of asbestos mining and asbestos processing, and those exposed to asbestos products in the construction, demolition or asbestos removal sectors. However, toxic exposures may also occur as a result of environmental or domestic exposure to asbestos; people at risk via these routes include those who live near asbestos mining or manufacturing sites, people whose family members work in the asbestos industry<sup>7</sup> or consumers who buy products that contain asbestos, if those products are broken or weathered.

The great majority of mesotheliomas are due to asbestos exposure. About 80% of mesothelioma



## Basic Facts: Asbestos Related Diseases (ARDs)

- Larynx Cancer
- Asbestosis
- Lung Cancer
- Pleural Thickening / Pleural Plaques
- Pleura Mesothelioma
- Peritoneal Mesothelioma
- Ovarian Cancer

patients have had some occupational exposure to asbestos, and therefore a careful occupational and environmental history should be taken.<sup>8</sup>

While exposure to asbestos fibre is a direct cause of lung cancer, it has also been shown that smokers who are exposed to asbestos fibres are much more likely to contract lung cancer; the heavier the smoking burden and the asbestos exposure, the greater the health risk.<sup>9</sup> The synergistic effect of tobacco smoking and asbestos consumption will result in increased cancer levels in decades to come in Asian countries, many of which have both high smoking incidences and high asbestos consumption levels.

Microscopic asbestos fibres are dangerous when released into the air when asbestos-containing roofing tiles or other asbestos containing products deteriorate, are renovated, demolished or damaged, such as in a natural or man-made disaster.<sup>10</sup> For this reason, the World Bank Group, humanitarian organizations and the United Nations High Commissioner for Refugees have recommended that asbestos-containing materials including asbestos-cement building products should not be used in disaster relief.<sup>11</sup>

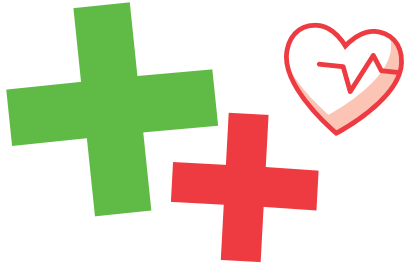
The cancers and other diseases associated with asbestos can take several decades to develop after exposure to the fibre. For countries in Asia

that have only in recent decades consumed asbestos this will result in a future cancer epidemic, unless action is taken to stop use as soon as possible.

Medical surveillance of workers in the asbestos industry is, in many countries, only carried out while they are working. While it is sometimes possible to diagnose the presence of ARDs such as asbestosis, mesothelioma or lung cancer while amongst employed personnel, these diseases amongst many more workers only become manifest after retirement or after they have left employment in the at-risk sector.

*'In order to prevent the epidemic of asbestos-related diseases from being repeated among workers and communities in the developing world, ceasing the use of new asbestos is essential'*

- Helsinki Declaration, 2014<sup>12</sup>



## How big is the health impact globally of asbestos?

Estimates from WHO in 2004 put the annual deaths from asbestos related disease at 107,000.<sup>13</sup> The global burden of deaths attributable to asbestos has been estimated by The Global Burden of Disease study in 2017 at over 222,000 persons annually in 2016.<sup>14</sup> Europe and USA currently carries the majority of the global asbestos-related disease burden as a consequence of heavy asbestos consumption during earlier decades.<sup>15</sup>

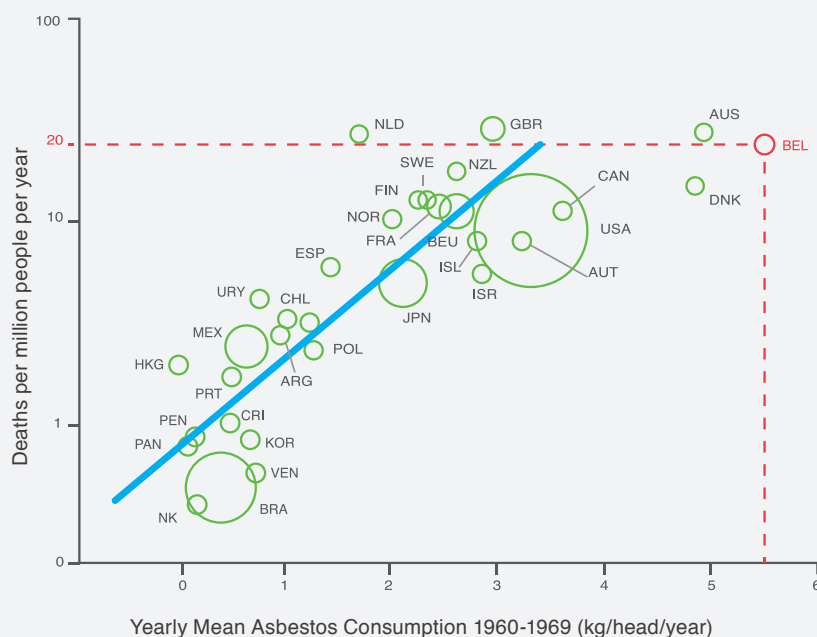
However the estimates for Asia are also already alarming, and set to increase in line with more recent consumption. For example, the estimates for ARD deaths in Vietnam for 2016 are 2,000 persons, for Thailand 1,556, Indonesia 984, Australia 4,048 and China 20,940.<sup>16</sup>

The graph above shows the strong link between a countries consumption of asbestos in the 1960s and the occurrence of asbestos disease 30 years later.<sup>17</sup>

The harmful effects of occupational exposure to asbestos were first noted by factory inspectors in Europe over a century ago, and the first medical research on the hazards of asbestos dust appeared in the British Medical Journal in 1924.<sup>18</sup>

The vast majority of countries in the world either have formally banned the use of all types of asbestos, including chrysotile asbestos, or no longer use it because of its deadly legacy for workers and communities.

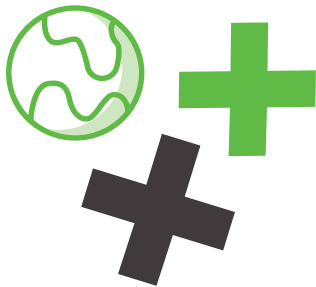
## Global Experience : Clear evidence that National Asbestos Consumption is directly linked to Mesothelioma Deaths.



Source: Lancet 2007

'As a legacy of past use of asbestos, the number of cases of asbestos-related diseases continues to climb every year across Canada and in many other industrialised countries. Consequently, the countries that used asbestos in the past, such as Canada, the United States (US), Australia, and throughout Europe, have either adopted a legal ban, or have virtually ceased using asbestos altogether'

- Joint Policy Committee of the Societies of Epidemiology, 2012<sup>19</sup>



### Which countries are still producing, using and trading in it?

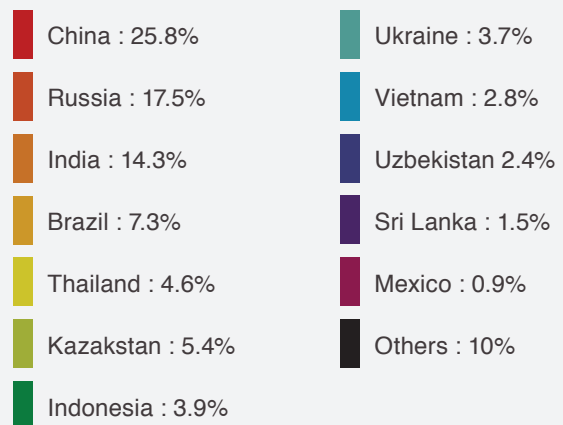
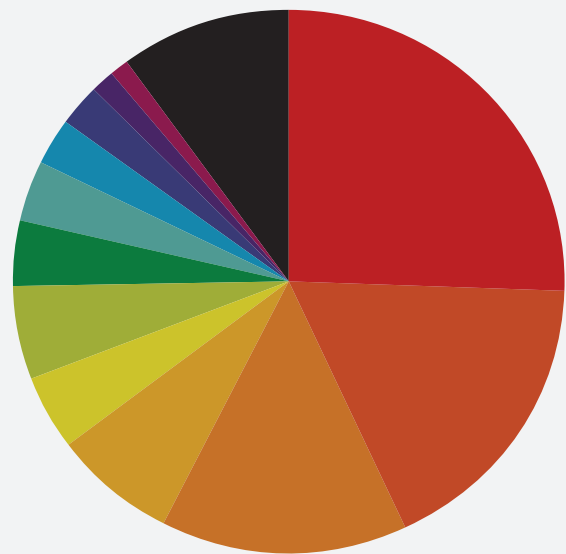
Global use of chrysotile asbestos has more than halved since its peak of 4.8 million tonnes in the 1980's to around 1.5 to 2 million metric tons per year more recently as more than 60 countries adopted national asbestos bans.<sup>20</sup>

Fewer than 15% of the 195 countries belonging to the UN used more than 1,000 tons of chrysotile asbestos in 2015. In that year, just seven countries in the world used more than 50,000 tons (i.e. China, Russia, India, Brazil, Indonesia, Vietnam and Uzbekistan).<sup>21</sup>

Asbestos is mined on a large-scale in just 3 remaining countries in 2018 with mines in Russia, China and Kazakhstan. Russia and Kazakhstan now supply most asbestos for export.

Asia is now the last major region consuming chrysotile asbestos, accounting for more than

### Top 12 Asbestos Consuming Countries



Source: US Geological Survey

75% of the world's annual consumption.<sup>22</sup> Canada and Brazil had been major exporters until they stopped exporting or announced bans on chrysotile asbestos in 2016 and 2017 respectively.

In 2017, just four countries were producing asbestos with total output dropping to 1.3 million tonnes according to the United States Geological Survey. This is also the last year Brazil will appear as a producer following their ban in November 2017.

Country	Metric tons of imported asbestos (2015) <sup>23</sup>
India	318,670
Indonesia	120,458
China	108,895
Vietnam	61,282
Uzbekistan	56,051
Thailand	36,513
Sri Lanka	34,505
Mexico	12,077
Turkmenistan	4,788
Kyrgyzstan	4,451
Malaysia	2,977
Pakistan	2,858
Philippines	1,775
<b>TOP 13 Asbestos Importing Countries:</b>	<b>765,300</b>
<b>TOTAL:</b>	<b>824,557</b>

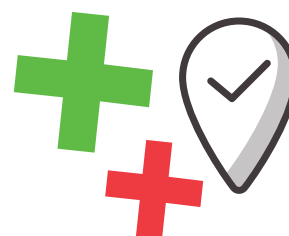
Source: Preliminary Estimates of Global Asbestos Production, Trade, & Consumption in 2016, United States Geological Survey

## What countries have banned asbestos?

Denmark was the first country to ban asbestos in 1972. By the end of 2018 at least 63 countries - including Australia, Japan, South Korea, South Africa, Brazil, and the entire European Union - have banned the use of all forms of asbestos.<sup>24</sup> Canadian legislation banning asbestos is expected in 2018.

## Does banning asbestos conflict with trade rules under the World Trade Organisation?

No it does not. There has already been a test case brought to the WTO in 2001. This was a case brought by Canada against the European Communities over the French asbestos ban. The decision of the WTO was that countries had the



right to ban asbestos “to protect human ... life or health”, within the meaning of Article XX(b) of the GATT 1994”<sup>25</sup>.

## Asbestos is not a ‘cheap’ building material and transitioning to non-asbestos alternatives is possible without negatively affecting the economy of developing and newly industrialising countries

Asbestos is often sold and promoted in Asia on the basis that it is a cheap and durable building



material. Particularly roof sheeting and other asbestos cement products, insulation board, ropes, pipes, floor and wall coverings etc. It is also found in friction products such as gaskets and brake pads. It should be kept in mind that different countries may have different industrial applications.

The “low cost” of asbestos-containing products is cited as an argument from some, as a justification for continuing the use of asbestos, particularly in providing cheap housing material for the poor. The purported “low cost”, fails to consider the asbestos disease burden it causes and the compensation and health care costs for future ARD sufferers, the exposure risks for those living in houses with degrading toxic roofing as well as the future costs of removing and safely disposing of asbestos-containing materials from buildings and other products.

The economic cost of continuing to use asbestos is high. A recent WHO study <sup>26</sup> has estimated annual global health care costs associated with the health effects of asbestos are estimated to be USD 2.4–3.9 billion, excluding the additional costs of pain, suffering and welfare losses. Other costs include remediation and removal costs, particularly for countries moving away from asbestos, as well as compensation costs, which may include significant litigation costs for some countries. Recent research<sup>27</sup> shows no impact on GDP from banning asbestos in any of the more than 60 countries that have banned asbestos already.

Even at local or regional levels, this research shows where there are short- term employment losses from banning, these job losses recover within 2 years.

‘In a regional case study, we compare changes in GDP and employment with changes in asbestos production. Regional-level data revealed a temporary employment decline at the local level that was then reversed.’

‘Country-level data reveal no observable negative effects on gross domestic product (GDP) following an asbestos ban or a decline in consumption or production..... this analysis suggests that producer and consumer countries also would not experience an observable effect on GDP at the country-level from a ban or a decline in consumption and production’.

- International Journal of Environmental Research and Public Health 16 March 2018

The cost of delaying a ban, is however large on the future economy of any country.

*‘When health and remediation costs are factored in, the use of asbestos not only causes a human tragedy, but also an economic disaster. This is the experience in every country where asbestos has been used in the past: health care, compensation, and remediation costs cumulatively reach billions of dollars’.* - Joint Policy Committee of the Societies of Epidemiology, 2012<sup>28</sup>

With so many countries banning asbestos since 1972, there is now considerable research, experience and evidence around quality and price competitive substitute materials. Substitute technology and materials are now available for all previous asbestos containing materials.<sup>29</sup> This means countries banning asbestos now can take advantage of this experience to transition out of asbestos more quickly.

A World Bank study carried out in 2009 found that the direct cost of substituting asbestos building material with a safer alternative was 10-15% greater, a small cost considering the vastly greater indirect costs in human health.<sup>30</sup>

In other countries such as Thailand, prices are comparable, or even cheaper for non-asbestos alternatives <sup>31</sup> according to a survey done by a Thai Consumers group comparing prices in different Provinces of different brands of roof sheet.

There are safer substitutes for asbestos containing products that are already used in Asia and all countries that have banned asbestos.<sup>32</sup>

*'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'* - Collegium Ramazzini, 2015.<sup>33</sup>



### **Can asbestos be 'used safely' as stated by asbestos exporting countries and some asbestos using companies?**

The vast majority of independent scientists and researchers from around the world as well as the ILO and the WHO all reject the argument of 'safe or controlled use' promoted by the asbestos industry. Some researchers and scientists linked to the asbestos industry however argue 'safe use' is possible based on industry-funded research or faulty arguments.

The WHO has also clearly articulated opposition to the 'safe use' argument.

'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'.

- World Health Organisation, 2006<sup>34</sup>

In 2001 the World Trade Organization reported:

'The Panel found too that the efficacy of "controlled use" is particularly doubtful for the building industry and for DIY [do-it-yourself] enthusiasts, which are the most important users of cement-based products containing chrysotile asbestos.' The WTO stated "... we note that the carcinogenicity of chrysotile fibres has been acknowledged for some time by international bodies. This carcinogenicity was confirmed by the experts consulted by the Panel, with respect to both lung cancers and mesotheliomas, even though the experts acknowledged that chrysotile is less likely to cause mesotheliomas than amphiboles. We also note that the experts confirmed that the types of cancer concerned had a mortality rate of close to 100 percent. We therefore consider that we have sufficient evidence that there is in fact a serious carcinogenic risk associated with the inhalation of chrysotile fibres'.

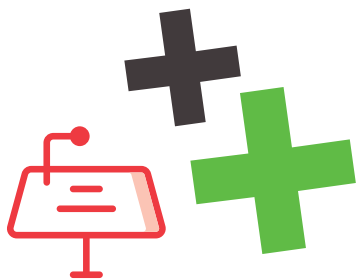
- WTO, 2001<sup>35</sup>

The International Labour Organization (ILO) Asbestos Convention 162 1986, is often misquoted by the asbestos industry to justify the 'safe use' or 'controlled use' of asbestos in the manufacturing process. The ILO was so concerned at this misinformation campaign by

the asbestos industry in 2006 the ILO passed a further Recommendation to make completely clear its position.

‘(a) the elimination of the future use of asbestos and the identification and proper management of asbestos currently in place are the most effective means to protect workers from asbestos exposure and to prevent future asbestos-related diseases and deaths; and (b) the Asbestos Convention, 1986 (No. 162), should not be used to provide a justification for, or endorsement of, the continued use of asbestos’.

- ILO, 2006<sup>36</sup>



## Chrysotile asbestos and the Rotterdam Convention

The Rotterdam Convention is a multinational treaty established in 2004 to provide importing countries the right to prior informed consent before receiving imports of hazardous substances from exporting countries. For over a decade chrysotile asbestos has been recommended for listing onto the hazardous chemical register (Annex III) of the Rotterdam Convention. A panel of independent scientists appointed to the Chemical Review Committee of the Rotterdam Convention has agreed chrysotile asbestos meets all requirements for listing since 2006.

The recommendation to list chrysotile asbestos has therefore been put to every Conference of the Parties (COP) for more than a decade. However, the Rotterdam Convention requires unanimity for a substance to be listed. That is, all countries must agree. In May 2017, as in previous conferences, a small minority of countries with commercial interests in continued asbestos use, including Russia, India, Kazakhstan and Zimbabwe, blocked the listing.

## Lobbying and misinformation from the chrysotile asbestos industry

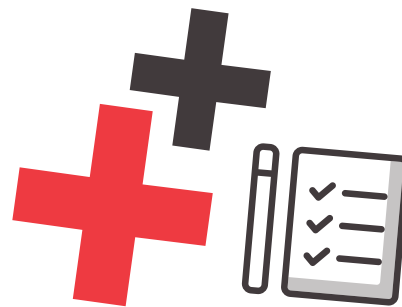
The asbestos lobby often denies that chrysotile asbestos is hazardous to health and seeks to blame asbestos disease on the other types of asbestos.<sup>37</sup> They argue ‘safe or controlled use’ is possible, despite ‘safe use’ of chrysotile asbestos never having been documented.<sup>38</sup> This position is also not supported by any independent scientific institution or reputable research institution. This includes the WHO and the ILO.<sup>39</sup>

Claims from the asbestos industry and a small associated group of researchers, that chrysotile fibers dissolve in the body in 14 days and therefore do not cause asbestos disease, are completely false.<sup>40</sup>

The chrysotile industry uses its own funded research to spread doubt and confusion among policy makers, using a small number of researchers who publish frequently, supporting the industry position. The goal is to delay regulation and banning of chrysotile asbestos in countries that have not yet banned its use.

As has been revealed through a UK Court case in 2017, large sums of money has also been spent on industrial spying by some in the industry, in an attempt to weaken ban asbestos voices in their campaign to ban this deadly product.<sup>41</sup> The use of public relation firms to lobby governments to protect vital chrysotile markets remains routine

The interests of many asbestos mining companies and the industry more generally are represented by the International Chrysotile Association (ICA), which is determined to expand its export of asbestos to the global South, particularly to Asia. The Directors of the ICA have generally been representatives of asbestos mines in Russia, Kazakhstan and Zimbabwe and representatives of asbestos products industries in India and Mexico.



The ICA spends significant funds on publications and promotion of their deadly product. Even governments that export the product continue to falsely maintain on occasion, that chrysotile asbestos is not harmful to health.

‘Similar to the tobacco industry, the asbestos industry has funded and manipulated research to manufacture findings favourable to its own interests. It has set up front organisations claiming to be expert scientific institutes, such as the Canadian Chrysotile Institute, the Russian Chrysotile Institute, and the Brazilian Chrysotile Institute. But, they are, in reality, lobby groups promoting the continued use of asbestos’.

- Joint Policy Committee of the Societies of Epidemiology, 2012<sup>42</sup>

In Asia, the asbestos lobby is also represented by the Chrysotile Information Centre (CIC). According to a CIC briefing paper, the CIC have a regional presence in 8 locations in Asia: Thailand, Vietnam, Malaysia, Cambodia, Sri Lanka, Pakistan, Laos and the Philippines.



## Evidence from Australia regarding chrysotile asbestos

Australia is known to have had the highest per-capita asbestos consumption level of any nation, reaching a peak in the 1970s. Consequently, the country’s current mortality rate for mesothelioma is among the highest in the world. A complete asbestos ban was implemented in 2003. Despite the ban on all types of asbestos, including chrysotile asbestos, in place for over 15 years and on crocidolite for over 40 years, Australia’s incidence of mesothelioma has not yet diminished. The Asbestos Safety and Eradication Agency concludes that in Australia currently up to 4,000 Australians are dying each year from asbestos-related diseases as a result of exposure to chrysotile asbestos.

‘There is clear and unequivocal evidence that the mining of chrysotile asbestos and importation of chrysotile asbestos into Australia has directly caused thousands of asbestos-related deaths over the decades since the 1930s. We are able to trace in our population in most cases of ARD, where and when exposure occurred and what type of asbestos workers and communities were exposed too. We are therefore able to conclude that in Australia currently, up to 4,000 Australians are dying each year from all forms of asbestos-related diseases as a result of exposure to chrysotile asbestos.’

In our view arguments by the asbestos industry that chrysotile is safe to use and does not cause asbestos related diseases is total misinformation and not what the evidence shows in Australia and around the world. From Australia's experience, continued use of chrysotile asbestos will inevitably mean higher rates of cancers in exposed populations in coming decades including lung cancers, mesothelioma, cancer of larynx and intestinal cancers'.  
- Mr Peter Tighe, CEO of Asbestos Safety and Eradication Agency<sup>43</sup>

## How can countries eliminate asbestos related diseases?

There is no evidence of a threshold for the carcinogenic effect of exposure to chrysotile asbestos. As such, a key recommendation from both ILO and WHO is that the most efficient and effective way to prevent asbestos exposure and disease is to stop using all types of asbestos.

Due to the enormous health, economic and environmental burden on countries and individuals caused by asbestos and the continuing use of chrysotile asbestos by some countries, the ILO and WHO have collaborated on developing a national programme for elimination of asbestos related diseases for member states<sup>44</sup>. They jointly recommend that the program should include the development of strategic national policy based on developing a national asbestos profile; awareness raising; capacity building; an institutional framework and a national plan of action for elimination of asbestos-related diseases. The full outline is available at: [http://www.who.int/occupational\\_health/publications/elim\\_asbestos\\_doc\\_en.pdf?ua=1](http://www.who.int/occupational_health/publications/elim_asbestos_doc_en.pdf?ua=1)

In many countries around the world an important element in eliminating asbestos related diseases and stopping the use of asbestos has been awareness raising and advocacy by those most affected by the deadly fibre. This includes

victims of the disease, trade unions, health and environment groups, the medical profession, the media and scientists all working together to promote the overwhelming international evidence to their governments, other policy makers as well as those most at risk of exposure to this deadly product.

The International Commission on Occupational Health (ICOH), the world's leading international scientific society in the field of occupational health with a membership of 2,000 professionals from 93 countries, has also recommended.

'Achieving a worldwide ban on the mining, sale and use of all forms of asbestos and the elimination of asbestos-related diseases will require that physicians and occupational health personnel responsibly and persistently express their concerns, raise awareness and take necessary action regarding the need to prevent asbestos-related diseases. Recognizing the urgent need for coordinated actions'.<sup>45</sup>

For further information please visit WHO or ILO websites:

[http://www.who.int/ipcs/assessment/public\\_health/asbestos/en/](http://www.who.int/ipcs/assessment/public_health/asbestos/en/)

[www.ilo.org/safework/areasofwork/occupational-health/WCMS\\_360580/lang--en/index.htm](http://www.ilo.org/safework/areasofwork/occupational-health/WCMS_360580/lang--en/index.htm)

Review references listed in this booklet or contact: Phillip Hazelton  
[phazelton@apheda.org.au](mailto:phazelton@apheda.org.au)

## References and Endnotes

1. **USGS, 2013.** Minerals Yearbook: Asbestos. United States Geological Survey [Advance Release], U.S. Department of the Interior. <http://minerals.usgs.gov/minerals/pubs/commodity/asbestos/myb1-2013-asbes.pdf>
- Virta, RL, 2006.** Worldwide asbestos supply and consumption trends from 1900 through 2003: U.S. Geological Survey Circular 1298. <http://pubs.usgs.gov/circ/2006/1298/c1298.pdf>
2. **WHO Fact Sheet Elimination of asbestos-related diseases Aug 2 2017.** <http://www.who.int/mediacentre/factsheets/fs343/en/>
3. **IPCS, 1998.** Environmental Health Criteria 203 – Chrysotile Asbestos. International Programme on Chemical Safety, United Nations Environment Programme, the International Labour Organisation, and the World Health Organization, Geneva; WHO. <http://www.inchem.org/documents/ehc/ehc/ehc203.htm>;
- WTO, 2001.** European Communities-Measures Affecting Asbestos and Asbestos-Containing Products. World Trade Organization. 12 March 2001. [https://www.wto.org/english/tratop\\_e/dispu\\_e/135abr\\_e.pdf](https://www.wto.org/english/tratop_e/dispu_e/135abr_e.pdf),
- IARC, 2012.** International Agency for Research on Cancer. IARC Monographs Volume 100C: Arsenic, Metals, Fibres and Dusts; A Review of Human Carcinogens <http://monographs.iarc.fr/ENG/Monographs/vol100C/mono100C.pdf>;
- WHO, 2014.** Chrysotile Asbestos. World Health Organization. [http://www.who.int/ipcs/assessment/public\\_health/chrysotile\\_asbestos\\_summary.pdf](http://www.who.int/ipcs/assessment/public_health/chrysotile_asbestos_summary.pdf);
- Collegium Ramazzini, 2015.** The Global Health Dimensions of Asbestos and Asbestos-Related Diseases. Castello di Bentivoglio, Via Saliceto, 3, 40010 Bentivoglio, Bologna, Italy.
4. **See document WHO/SDE/OEH/06.03, Elimination of Asbestos-related Diseases, WHO, Geneva, 2006,** available at [http://www.who.int/occupational\\_health/publications/asbestosrelateddiseases.pdf](http://www.who.int/occupational_health/publications/asbestosrelateddiseases.pdf);
- IARC, 1977.** IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man- Asbestos. Vol. 14. International Agency for Research on Cancer, World Health Organization, Lyon, France, pp. 106. <http://monographs.iarc.fr/ENG/Monographs/vol100C/mono100C.pdf>
5. <http://monographs.iarc.fr/ENG/Classification/>
6. **IARC Monographs on Asbestos Vol 2, 1973:** sufficient evidence in humans, sufficient evidence in animals (1) • Vol 14, 1977: sufficient evidence in humans, sufficient evidence in animals (1) • Suppl 7, 1987: sufficient evidence in humans, sufficient evidence in animals, 1 <http://monographs.iarc.fr/>
7. **Ferrante D, Mirabelli D, Tunesi S, et al., 2015.** Pleural mesothelioma and occupational and non-occupational asbestos exposure: a case-control study with quantitative risk assessment. Occup Environ Med, Published Online First: 11 Aug 2015 [doi:10.1136/oemed-2015-102803](https://doi.org/10.1136/oemed-2015-102803) <https://www.ncbi.nlm.nih.gov/pubmed/26265669>
- Stayner LT, 2015.** Para-occupational exposures to asbestos: lessons learned from Casale Monferrato, Italy. Occup Environ Med, Published Online First: [doi:10.1136/oemed-2015-103233](https://doi.org/10.1136/oemed-2015-103233) <https://www.ncbi.nlm.nih.gov/pubmed/26552696>
- Wagner, J.C., Sleggs, C.A., and Marchand, P, 1960.** Diffuse pleural mesothelioma and asbestos exposure in North West Cape Province. Br J Ind Med; 17: 260–271
8. **Journal of Work Environment and Health ‘Asbestos, asbestosis, and cancer, the Helsinki criteria for diagnosis and attribution 2014: recommendations’** by Wolff H, reporter, Vehmas T, reporter, Oksa P, reporter, Rantanen J, reporter, Vainio H.
9. **WHO Fact Sheet Elimination of asbestos-related diseases Aug 2 2017.** <http://www.who.int/mediacentre/factsheets/fs343/en/>
10. **Position Statement on Asbestos from the Joint Policy Committee of the Societies of Epidemiology (JPC-SE), June 4, 2012.** [https://www.ijpc-se.org/documents/03.JPC-SE-Position\\_Statement\\_on\\_Asbestos-June\\_4\\_2012-Full\\_Statement\\_and\\_Appendix\\_A.pdf](https://www.ijpc-se.org/documents/03.JPC-SE-Position_Statement_on_Asbestos-June_4_2012-Full_Statement_and_Appendix_A.pdf)
11. **WBG, 2009.** Good Practice Note: Asbestos: Occupational and Community Health Issues, May, World Bank Group. <http://siteresources.worldbank.org/EXTPOPS/Resources/AsbestosGuidanceNoteFinal.pdf>
- UNHCR, 2005.** Procurement and use of material containing asbestos for UNHCR-funded projects. United Nations High Commissioner for Refugees. Inter-Office Memorandum No. 025/2005. 29 March.
12. **Helsinki Declaration, 2014.** The Helsinki Declaration on Management and Elimination of Asbestos-Related Diseases. Adopted by the International Conference on Monitoring and Surveillance of Asbestos-Related Diseases, 10-13 February 2014, Finnish Institute of Occupational Health and International Commission on Occupational Health Espoo, Finland. [http://www.ttl.fi/en/international/conferences/helsinki\\_asbestos\\_2014/Documents/20%20March%202014%20Final%20Signed%20Declaration%20for%20website.pdf](http://www.ttl.fi/en/international/conferences/helsinki_asbestos_2014/Documents/20%20March%202014%20Final%20Signed%20Declaration%20for%20website.pdf)
13. **WHO International Program on Chemical Safety** [www.who.int/ipcs/assessment/public\\_health/asbestos/en/](http://www.who.int/ipcs/assessment/public_health/asbestos/en/)
14. **IHME Global Burden of Disease** <http://vizhub.healthdata.org/gbd-compare/>
15. **WHO 2014,** Asbestos: use, bans and disease burden in Europe
16. **IHME Global Burden of Disease** <http://vizhub.healthdata.org/gbd-compare/>
17. **Lin-RT, Takahashi K, Karjalainen A, et al.** Ecological association between asbestos-related diseases and historical asbestos consumption: an international analysis. Lancet 2007; 369:844-49
18. **Cooke WE. 1924,** Fibrosis of the lungs due to the inhalation of asbestos dust. BMJ, 1924;2:147.
19. **JPC-SE, 2012.** Position Statement on Asbestos from the Joint Policy Committee of the Societies of Epidemiology (JPC-SE), June 4. [https://www.ijpc-se.org/documents/03.JPC-SE-Position\\_Statement\\_on\\_Asbestos-June\\_4\\_2012-Full\\_Statement\\_and\\_Appendix\\_A.pdf](https://www.ijpc-se.org/documents/03.JPC-SE-Position_Statement_on_Asbestos-June_4_2012-Full_Statement_and_Appendix_A.pdf)

20. **WHO 2014**, Asbestos: use, bans and disease burden in Europe. Takashi Kameda, Ken Takahashi, Rokho Kim, Ying Jiang, Mehrnoosh Movahed, Eun-Kee Park & Jorma Rantanen. <http://www.who.int/bulletin/volumes/92/11/13-132118/en/>
21. **USGS** Estimates of Global Production Trade Consumption of Asbestos 2015
22. **Frank and Joshi 2014**, The Global Spread of Asbestos. *Annals of Global Health*. 80(4), pp. 257–262 <http://dx.doi.org/10.1016/j.aogh.2014.09.016>
23. **Preliminary Estimates of Global Asbestos Production, Trade, & Consumption in 2016, United States Geological Survey**
24. **IBAS, 2017**. Current Asbestos Bans and Restrictions, Compiled by Laurie Kazan-Allen. International Ban Asbestos Secretariat, 2017. [http://www.ibasecretariat.org/alpha\\_ban\\_list.php](http://www.ibasecretariat.org/alpha_ban_list.php)
25. **WTO 'EUROPEAN COMMUNITIES – MEASURES AFFECTING ASBESTOS AND ASBESTOS-CONTAINING PRODUCTS' WT/DS135/AB/R** March 12 2001
26. **Asbestos Economic Assessment of Bans and Declining Production and Consumption**; Lucy P. Allen, Jorge Baez, Mary Elizabeth C. Stern and Frank George 201)
27. **International Journal of Environmental Research and Public Health 16 March 2018**. 'Trends and the Economic Effect of Asbestos Bans and Decline in Asbestos Consumption and Production Worldwide', Lucy P. Allen, Jorge Baez, Mary Elizabeth C. Stern\*, KenTakahashi and Frank George.
28. **Position Statement on Asbestos from the Joint Policy Committee of the Societies of Epidemiology (JPC-SE). June 4, 2012 JPC-SE**
29. [http://www.ibasecretariat.org/bc\\_subst\\_asb\\_cem\\_constr\\_prods.php](http://www.ibasecretariat.org/bc_subst_asb_cem_constr_prods.php)
30. **WBG, 2009**. Good Practice Note: Asbestos: Occupational and Community Health Issues, May, World Bank Group. <http://siteresources.worldbank.org/EXTPOPS/Resources/AsbestosGuidanceNoteFinal.pdf>
31. [www.riskcomthai.org](http://www.riskcomthai.org)
32. **WHO, 2017**. Asbestos Economic Assessment of Bans and Declining Production and Consumption Lucy P. Allen, Jorge Baez, Mary Elizabeth C. Stern and Frank George
33. **Collegium Ramazzini, 2015**. The Global Health Dimensions of Asbestos and Asbestos-Related Diseases. Castello di Bentivoglio, Via Saliceto, 3, 40010 Bentivoglio , Bologna, Italy.
34. **WHO, 2006**. Elimination of Asbestos-related Diseases. World Health Organization. [http://whqlibdoc.who.int/hq/2006/WHO\\_SDE\\_OEH\\_06.03\\_eng.pdf?ua=1](http://whqlibdoc.who.int/hq/2006/WHO_SDE_OEH_06.03_eng.pdf?ua=1)
35. **WTO - EUROPEAN COMMUNITIES – MEASURES AFFECTING ASBESTOS AND ASBESTOS-CONTAINING PRODUCTS 12** March 2001 pp44
36. **ILO Resolution Concerning Asbestos 2006** [http://www.ilo.org/safework/info/standards-and-instruments/WCMS\\_108556/lang--en/index.htm](http://www.ilo.org/safework/info/standards-and-instruments/WCMS_108556/lang--en/index.htm)
37. **Hazards Magazine Special Online Report March 2016** <http://www.hazards.org/asbestos/friendlyfibre.htm>
38. **Statement in Response to Asbestos Industry Efforts to Prevent a Ban on Asbestos in Pakistan** <https://www.tandfonline.com/doi/abs/10.1080/19338244.2013.780807?journalCode=vaeh20>
39. **WHO Chrysotile Asbestos 2014** [http://www.who.int/ipcs/assessment/public\\_health/chrysotile\\_asbestos\\_summary.pdf](http://www.who.int/ipcs/assessment/public_health/chrysotile_asbestos_summary.pdf)
40. **Video clip from Chrysotile Information Centre.** <https://www.youtube.com/user/chrysotileinfo>  
**Richard L. Kradin MD, George Eng MD, | David C. Christiani MD 2017.** *Diffuse peritoneal mesothelioma: A case series of 62 patients including paraoccupational exposures to chrysotile asbestos*  
**Leslie T Stayner, PhD, David A. Dankovic, PhD, and Richard A. Lemen, PhD 1996.** *Occupational Exposure to Chrysotile Asbestos and Cancer Risk: A Review of the Amphibole Hypothesis*  
**Suzuki Y1, Kohyama N. Am J Ind Med. 1991;19(6):701-4.** *Translocation of inhaled asbestos fibers from the lung to other tissues.*  
**Xiaorong Wang,1 Eiji Yano,2 Hong Qiu,1 Ignatius Yu,1 Midori N Courtice,1 L A Tse,1 Sihao Lin,1 Mianzhen Wang 2011.** *A 37-year observation of mortality in Chinese chrysotile asbestos workers.*  
**American Journal of Industrial Medicine, volume 44, number 5, pages 540-557, November 2003.** *Exposing the “myth” of ABC, “anything but chrysotile”: a critique of the Canadian asbestos mining industry and McGill University chrysotile studies*
41. **New Matilda, March 5 2017.** LETHAL LIES: How A Corporate Spy For A Kazakhstan Company Infiltrated The Global Anti-Asbestos Network <https://newmatilda.com/2017/03/05/lethal-lies-how-a-corporate-spy-for-a-kazakhstan-company-infiltrated-the-global-anti-asbestos-network/>
42. **Position Statement on Asbestos from the Joint Policy Committee of the Societies of Epidemiology (JPC-SE). June 4, 2012.**
43. **Tighe, P. 2017.** Statement re Chrysotile Asbestos. August 31 2017
44. **WHO/ILO 2007.** *Outline for the Development of National Programmes for Elimination of Asbestos-Related Diseases* [www.who.int/occupational\\_health/publications/Out\\_NPEAD\\_ENG.pdf](http://www.who.int/occupational_health/publications/Out_NPEAD_ENG.pdf)
45. **ICOH Statement: Global Asbestos Ban and the Elimination of Asbestos-Related Diseases** [http://www.icohweb.org/site\\_new/multimedia/news/pdf/ICOH%20Statement%20on%20global%20asbestos%20ban.pdf](http://www.icohweb.org/site_new/multimedia/news/pdf/ICOH%20Statement%20on%20global%20asbestos%20ban.pdf)

**This booklet is endorsed by the following organisations**



**Australian Government**

**Asbestos Safety and Eradication Agency**



© 2018 Union Aid Abroad APHEDA

Text by: Phillip Hazelton, phazelton@apheda.org.au

Available in English, Bahasa Indonesia, Vietnamese, Lao, Khmer

#### **Acknowledgements**

Union Aid Abroad – APHEDA would like to acknowledge the valuable assistance of the following organisations and individuals in preparing this resource.

Australian Asbestos Safety and Eradication Agency (ASEA) Sydney Australia

Asbestos Disease Research Institute (ADRI) Sydney Australia

Building Workers International (BWI) Global Trade Union

International Ban Asbestos Secretariat (IBAS) UK

Asia Ban Asbestos Network (ABAN) Japan

Prof. Ken Takahashi, Peter Tighe, Nick Miller, Laurie Kazan-Allen, Sugio Furuya, Rory O'Neill, Apolinar Tolentino, Fiona Murie, Edward Miller and Emma Bacon

Supported by the Australian Government.

