
ASBESTOS: THE SCIENTIFIC FACTS & CHALLENGES



21ST AUGUST 2021 (EDITED 15 OCT)

Asbestos Awareness Australia



Asbestos Awareness Australia Ltd is a registered not-for-profit company limited by guarantee, is a registered charity, and has endorsement from the Australian Taxation Office as a gift deductible recipient

Contents

Health Outcomes	3
Asbestosis	4
Mesothelioma	4
Lung cancer	5
Diagnoses and Deaths from Asbestos-Related Diseases	5
Mesothelioma	5
Lung Cancer	6
Other Asbestos-Related Diseases	6
Sources of Asbestos Exposure	6
Legacy Asbestos	7
Safe Levels of Exposure	8
Occupational & Non-Occupational Exposures	9
Home Renovations	10
Generally Accepted Facts	12
Background Facts	12
Asbestosis	13
Mesothelioma	14
Lung Cancer	16
Occupational Exposure	17
Non-Occupational or Environmental Exposure	18
Exposure During Home Renovations	19
Females Diagnosed with Asbestos-related Diseases	20
Uncertainties & Unknowns	21
Our Summary & Views	22
Asbestos Awareness Australia Ltd	25

[N]ot only was the medical profession's reaction to the asbestos hazard often feeble, but scientists have also been among the industry's most strident defenders. There are two reasons why that was so: corporate suppression and intimidation meant that criticism of the industry came at a price ... and the convergence of the economic, political and social interests of the scientific establishment and commerce.¹

This paper summarises the science on asbestos-related diseases, with a primary focus on health outcomes and sources of exposure.

As with most areas of public health and disease, there are generally accepted scientific facts about asbestos-related diseases, as well as areas of uncertainty and unknowns.

Health Outcomes

Asbestos is carcinogenic and exposure to its fibres causes and contributes to mass loss of life in Australia and elsewhere.² There are two types of asbestos; serpentine and amphibole.³ Chrysotile (or white asbestos) falls within the serpentine group and accounts for more than 90 percent of asbestos usage globally.⁴

All types of asbestos can cause illnesses that are incurable and fatal. Diseases caused by exposure to asbestos include asbestosis, asbestos-related lung cancer,⁵

¹ Jock McCulloch and Geoffrey Tweedale, *Defending the Indefensible: The Global Asbestos Industry and its Fight for Survival* (2008, Oxford University Press, Oxford) 119 "Defending the Indefensible".

² See 'Global and Regional Burden of Cancer in 2016 Arising from Occupational Exposure to Selected Carcinogens: A Systematic Analysis for the Global Burden of Disease Study 2016' (2020) 77 *Occupational and Environmental Medicine* 151, 152. The Global Burden of Disease study estimated total deaths worldwide in 2016 from occupational asbestos exposure at 218,827 (including 181,450 deaths from lung cancer, 27,612 deaths from mesothelioma, 6022 deaths from ovarian cancer, and 3743 deaths from larynx cancer). Notably, this study estimate excludes deaths from non-occupational sources.

³ *Defending the Indefensible* 2

⁴ *Defending the Indefensible* 3.

⁵ At present, lung cancer is the form of cancer linked to the highest number of fatalities a year in Australia, with close to 9,000 deaths during 2019. See Australian Government, Cancer Australia, 'Lung Cancer Statistics' at <https://lung->

mesothelioma, larynx cancer and ovarian cancer.⁶ Among these health conditions, those associated with the most human fatalities are asbestosis, mesothelioma, and lung cancer.

Asbestosis

Asbestosis is a chronic lung disease caused exclusively by inhalation of asbestos fibres and results in the formation of scar tissue in the lungs around inflammation caused by asbestos fibres.⁷ While asbestosis is not fatal, it can trigger respiratory or cardiac failure and or can lead to subsequent diagnoses of mesothelioma or asbestos-related lung cancer.⁸ There is currently no cure for asbestosis.⁹

Mesothelioma

Mesothelioma (also called malignant mesothelioma) most often occurs when abnormal cells in the tissue that line or surrounds the lungs (the pleura) grow in an uncontrolled way. This form of cancer is called pleural mesothelioma. This is not the same as lung cancer, which starts inside the lungs.¹⁰

Mesothelioma can also arise in the cells that line the abdomen (the peritoneum); the cells that surround the heart (the pericardium); and the cells that cover the testicles.

Mesothelioma tumour cells may be epithelioid, sarcomatoid (fibrous) or mixed (biphasic).¹¹

[cancer.canceraustralia.gov.au/statistics](https://www.cancer.gov.au/statistics). See also Australian Government, Australian Institute of Health and Welfare, 'Cancer in Australia 2019' (Cancer 18 Series no 119. Cat no CAN 123, Canberra: AIHW) 96.

⁶ T Driscoll, D Nelson, K Steenland, James Leigh, M Concha-Barrientos, M Fingerhut and A Pruss-Ustun, 'The Global Burden of Disease Due to Occupational Carcinogens' (2005) 48 *American Journal of Industrial Medicine* 419.

⁷ Safe Work Australia, *Asbestos-Related Disease Indicators* (August 2012) v. SafeWork Australia is the federal body that oversees the handling of asbestos in Australian workplaces.

⁸ Safe Work Australia, *Asbestos-Related Disease Indicators* (August 2012) 2. For example, Bernie Banton suffered initially from asbestosis but was subsequently diagnosed with mesothelioma.

⁹ St Vincent's Hospital Lung Health, 'Asbestosis' at <https://www.svhlunghealth.com.au/conditions/asbestosis>.

¹⁰ Australian Government Cancer Australia, 'What is Mesothelioma?' at <https://www.cancer.org.au/cancer-information/types-of-cancer/mesothelioma>.

¹¹ Australian Government, Cancer Australia, 'Mesothelioma Cancer' viewed 17 July 2021 at <https://www.canceraustralia.gov.au/affected-cancer/cancer-types/mesothelioma-cancer/types-mesothelioma>.

Lung cancer

Lung cancer occurs when abnormal cells in the lung grow in an uncontrolled way. It often spreads (metastasises) to other parts of the body before the cancer is detected in the lungs.

While smoking is the primary risk factor for lung cancer, exposure to asbestos exacerbates the risks significantly and is an interacting factor.¹²

Diagnoses and Deaths from Asbestos-Related Diseases

The Asbestos Safety and Eradication Agency “ASEA” estimate around 4,000 Australians die each year from asbestos-related diseases,¹³ but provide no details on the makeup of this statistic. **For example, it is not clear whether this estimate includes fatalities arising from exposure in non-occupational settings. If not, it is understated.**

In any event, this scale of deaths from asbestos-related diseases in Australia is exponentially greater than most households believe. Our survey of more than 43,000 households found that most Australians think the number of deaths from these diseases is less than 50 each year.¹⁴

Mesothelioma

Mesothelioma is a notifiable diseases in Australia and the number of recorded diagnoses is published each year. There is a time lag between notifications and publication of the official statistics, so the diagnoses for prior years are commonly adjusted upwards overtime. Allowing for such adjustments, Cancer Australia

¹² I J Selikoff, EC Hammond and J Churg, ‘Asbestos Exposure, Smoking, and Neoplasia’ (1968) 204 *Journal of the American Medical Association* 106. While smoking is the largest risk factor for lung cancer, exposure to asbestos is an interacting risk factor that increases the risk of lung cancer exponentially. For a more recent medical outline on the interactions between smoking and asbestos exposure as contributors to lung cancer, see Sonya Klebe, James Leigh, Douglas Henderson and Markku Nurminen, ‘Asbestos, Smoking and Lung Cancer: An Update’ (2020) 17 *International Journal of Environmental Research and Public Health* 258.

¹³ Asbestos Safety and Eradication Agency, ‘Asbestos Health Risks’ viewed 16 May 2021 at <https://www.asbestossafety.gov.au/asbestos-health-risks-and-exposure/asbestos-health-risks>.

¹⁴ See Asbestos Awareness Australia Ltd, *Community Awareness & Knowledge of Asbestos Threats & Consequences* (May 2021).

estimates more than 830 people were diagnosed with mesothelioma in 2020.¹⁵ This is a record level of diagnoses, with an especially large increase in the number of female cases.

The processes used to determine the mesothelioma death counts published in the Australian Mesothelioma Registry “AMR” reports are unknown. Given the average survival period following a diagnosis is only 11 months,¹⁶ these statistics should be close to the levels of diagnoses.

Lung Cancer

A body of medical studies investigate the ratio of cases of lung cancer deaths caused by exposure to asbestos compared to mesothelioma fatalities. These study findings vary, with ratios spanning 2.0 to 6.6 times.¹⁷ Assuming 830 of the 4,000 deaths estimated by the ASEA are from mesothelioma, the remaining fatalities may include 1,660-3,320 deaths from lung cancer (based on a ratio of 2-4 asbestos-related lung cancer deaths for each mesothelioma fatality).

Other Asbestos-Related Diseases

Any remaining deaths included with the ASEA estimate likely relate to asbestosis and asbestos-related larynx cancer and ovarian cancer. Evidence on the number of deaths from these diseases in Australia is lacking.

Sources of Asbestos Exposure

Asbestos exposure is the only known cause of asbestosis and mesothelioma in Australia.¹⁸ Asbestos-related diseases are therefore preventable by avoiding

¹⁵ Australian Government, Cancer Australia, ‘Mesothelioma in Australia Statistics’ viewed 23 June 2021 at <https://mesothelioma-cancer.canceraustralia.gov.au/statistics>.

¹⁶ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2018* 1 “Mesothelioma 2018”.

¹⁷ See, eg, T Driscoll, D Nelson, K Steenland, James Leigh, M Concha-Barrientos, M Fingerhut and A Pruss-Ustun, ‘The Global Burden of Disease Due to Occupational Carcinogens’ (2005) 48 *American Journal of Industrial Medicine* 419.

¹⁸ Safe Work Australia, *Asbestos-Related Disease Indicators* (August 2012) v. See also T Driscoll, D Nelson, K Steenland, James Leigh, M Concha-Barrientos, M Fingerhut and A Pruss-Ustun, ‘The Global Burden of Disease Due to Occupational Carcinogens’ (2005) 48 *American Journal of Industrial Medicine* 419. The authors state that ‘malignant mesothelioma is virtually only caused by exposure to asbestos.’

exposure to asbestos fibres and dust.¹⁹

Asbestos fibres are non-discriminatory, and people diagnosed with asbestos-related diseases include males and females from all socioeconomic segments of the population.²⁰

Legacy Asbestos

While asbestos is a naturally occurring material, it only poses a risk to health in its natural form when removed or mined from under the ground, and the range of locations where underground asbestos potentially presents a risk across Australia is very limited.²¹

In contrast, products containing asbestos that were manufactured and sold by James Hardie Industries Ltd “James Hardie”, CSR Ltd “CSR” and others, and that are now inbuilt within government, commercial and residential properties across Australia, present a real and substantive risk to human life. Legacy asbestos in Australia is contained within literally thousands of different building and industrial products, including, for example, cement sheeting, roofs, and insulation. These products deteriorate or break down over time, and or can be disturbed during maintenance, renovation, or removal.²²

¹⁹ T Driscoll, D Nelson, K Steenland, James Leigh, M Concha-Barrientos, M Fingerhut and A Pruss-Ustun, ‘The Global Burden of Disease Due to Occupational Carcinogens’ (2005) 48 *American Journal of Industrial Medicine* 419. The authors conclude that work-related cancers are largely preventable. See also World Health Organization, ‘WHO Calls for Prevention of Cancer through Healthy Workplaces’ (Media release 27 April 2007).

²⁰ See, eg, *Defending the Indefensible* 222-223; *Asbestos Cost* 35. Past and present sufferers of asbestos-related diseases include judges, lawyers, architects, doctors and other professionals, state governors and cabinet ministers, and academics.

²¹ See, eg, NSW SafeWork, ‘Naturally Occurring Asbestos FAQs’ viewed 27 July 2021 at <https://www.safework.nsw.gov.au/resource-library/asbestos-publications/naturally-occurring-asbestos/naturally-occurring-asbestos-faqs2>. This website indicates that less than 1% of the land surface of NSW is estimated to have the potential for naturally occurring asbestos within 10 metres of the land surface.

²² See, eg, Corie Gray, Renee Carey and Alison Reid, ‘Current and Future Risks of Asbestos Exposure in the Australian Community’ (2016) 22 *International Journal of Occupational and Environmental Health* 292, 295; Peter Franklin and Alison Reid, ‘The Ongoing Problem of Asbestos In Situ’ in Lenore Layman and Gail Phillips (eds), *Asbestos in Australia* (Monash University Publishing, 2019) 265-268 “Asbestos in Australia”.

Safe Levels of Exposure

Scientists acknowledged in the 1960s that there is no safe level of exposure to asbestos. They indicated that the only safe level of exposure to asbestos is nil, with any exposure presenting certain and known risks.²³ These facts were confirmed by the the World Health Organization and International Agency for Research on Cancer in 1976 / 1977.²⁴

Many published medical sources since the 1960s reference and or discuss mesothelioma cases following exposure for brief periods and or low intensity dust levels.²⁵ For example, in 1964, a landmark article by Selikoff et al highlighted cases of asbestos-related deaths from mesothelioma, asbestosis, lung cancer, (and other forms of cancer) in insulation workers with relatively light and intermittent exposure to asbestos. The authors concluded that the possibility of environmental exposure to asbestos had long been known and suggested many other types of tradespersons would likely suffer similar outcomes.²⁶

In 1967, an article in the *Archives of Environmental Health* noted that 'the occupational exposure of insulation workers or textile workers were certainly many thousands times higher than those of neighbourhood cases or family contacts.'²⁷

An article published in the *Medical Journal of Australia* in 1968 warned of the development of mesothelioma after minor exposure to asbestos.²⁸

²³ *Amaca Pty Ltd v Werfel* [2020] SASCFC 125 [120] "Werfel Case" citing (1965) 132 *Annals of New York Academy of Sciences* 21-22.

²⁴ International Agency for Research on Cancer, 'Asbestos' (1977) 14 Monographs on the Evaluation of Carcinogen Risks of Chemicals to Man. See also International Agency for Research on Cancer, 'Asbestos. An Overall Evaluation of Carcinogenicity' (1987) IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans, suppl 7. Lyon, France: 106-116; World Health Organization, Elimination of Asbestos-Related Disease, (2006, Geneva) viewed 20 June 2020 at https://apps.who.int/iris/bitstream/handle/10665/69479/WHO_SDE_OEH_06.03_eng.pdf;sequence=1.

²⁵ See, eg, Werfel Case [125].

²⁶ I J Selikoff, J Churg and E Cuyler Hammond, 'Asbestos Exposure and Neoplasia' (1964) 188 *Journal of the American Medical Association* 22.

²⁷ Werfel Case [128] citing J Lieben and H Pistawka, 'Mesothelioma and Asbestos Exposure' (1967) 14 *Archives of Environmental Health* 559.

²⁸ Werfel Case [131]. Underlining added by authors for emphasis.

Occupational & Non-Occupational Exposures

The history of asbestos-related diseases is commonly described as arising in three waves.

1. The first wave of claims came from people directly involved in asbestos mining and the manufacture of asbestos-related materials.
2. The second wave of claims includes tradespeople working with materials containing asbestos, as well as persons in close contact, such as those washing clothes with asbestos fibres on them or children playing in asbestos dust.
3. The third wave of claims includes people exposed peripherally to asbestos products, including through home renovations or maintenance.²⁹

The linkages between asbestos exposure and sufferers of asbestos-related diseases within the first and second wave categories are well acknowledged in both medical and legal spheres in Australia and internationally.³⁰ Scientific evidence demonstrating that exposure to asbestos leading to a diagnosis of an asbestos related disease can, and does, arise in non-occupational or environmental settings is also longstanding.

For example, Wagner et al highlighted mesothelioma cases caused by environmental exposure in South Africa in 1960,³¹ Newhouse and Thompson identified

²⁹ See, eg, PJ Landrigan, 'The Third Wave of Asbestos Disease: Exposure to Asbestos in Place. Public Health Control. Introduction.' (1991) 643 *Annals of the New York Academy of Sciences* xv-xvi; Arthur W Musk, Nicholas H de Klerk and Anna Nowak, 'Asbestos Exposure: Challenges for Clinicians' (2016) 204 *Medical Journal of Australia* 48.

³⁰ See, eg, J Hansen, NH de Klerk, JL Eccles, AW Musk and MS Hobbs, 'Malignant Mesothelioma after Environmental Exposure to Blue Asbestos' (1993) 54 *International Journal of Cancer* 578; J Hansen, NH de Klerk, JL Eccles, AW Musk and MS Hobbs, 'Environmental Exposure to Crocidolite and Mesothelioma Exposure-Response Relationships' (1998) 157 *American Journal of Respiratory and Critical Care Medicine* 69; J Hansen, NH de Klerk, JL Eccles, AW Musk and MS Hobbs, 'Individual Exposure Levels in People Environmentally Exposed to Crocidolite' (1997) 12 *Applied Occupational and Environmental Hygiene* 485; A Reid, G Berry, J Heyworth, NH de Klerk and AW Musk, 'Cancer Incidence Among Women and Girls Environmental and Occupationally Exposed to Blue Asbestos at Wittenoom, Western Australia' (2008) 122 *International Journal of Cancer* 2337; A Reid, G Berry, J Heyworth, NH de Klerk and AW Musk, 'Predicted Mortality from Malignant Mesothelioma Among Women Exposed to Blue Asbestos at Wittenoom, Western Australia' (2019) 66 *Occupational Environmental Medicine* 169

³¹ JC Wagner, CA Sleggs, and P Marchand, 'Diffuse Pleural Mesothelioma and Asbestos Exposure in the North Western Cape Province' (1960) 17 *British Journal of Industrial Medicine* 260. Eleven of the 30 cases studied by Wagner had not worked with asbestos and arose from non-occupational sources of exposure. The industry tried to prevent publication of these results because they were viewed as a "bombshell": Asbestos House 49.

mesothelioma cases linked to household exposure in London in 1965,³² and Lieben and Pistawka discussed mesothelioma cases linked to non-occupational exposures in the United States in 1967.³³

While some scientists, officials and lawyers continue to deny or downplay the evidence (or significance) of third wave sufferers, available evidence on the risks of harmful exposure to legacy asbestos in Australian homes is, in our view, close to irrefutable.

Home Renovations

Within the non-occupational exposure risk category, expert warnings on incidences of mesothelioma linked to home renovations have been documented since the 1960s.³⁴ For example, an article in the *British Medical Journal* in 1967 observed that 'there is a vast number of "do-it-yourself" enthusiasts who may be exposed intermittently to highly concentrated asbestos dust'.³⁵ The authors note that in some cases, extremely short exposures have been reported.³⁶

Warnings from public health scholars and clinicians published within academic sources on the dangers of exposure during home renovations have increased markedly in Australia over the last decade.³⁷ For example:

³² ML Newhouse and H Thompson, 'Mesothelioma of Pleura and Peritoneum Following Exposure to Asbestos in the London Area' (1965) 22 *British Journal of Industrial Medicine* 261.

³³ See, eg, J Lieben and H Pistawka, 'Mesothelioma and Asbestos Exposure' (1967) 14 *Archives of Environmental Health* 559.

³⁴ See, eg, Werfel Case [125] citing 'Asbestosis' (1967) 5557 *British Medical Journal* 62, 62-63.

³⁵ See, eg, Werfel Case [125] citing 'Asbestosis' (1967) 5557 *British Medical Journal* 62, 62-63.

³⁶ See, eg, Werfel Case [125]. Underlining added by authors for emphasis.

³⁷ See, eg, NJ Olsen, PJ Franklin, A Reid, NH de Klerk, TJ Threlfall, K Shilkin and B Musk, 'Increasing Incidence of Malignant Mesothelioma After Exposure to Asbestos During Home Maintenance and Renovation' (2011) 195 *Medical Journal of Australia* 271; Eun-Kee Park, Deborah Yates, Rebecca Hyland and Anthony Johnson, 'Asbestos Exposure During Home Renovation in New South Wales' (2013) 199 *Medical Journal of Australia* 410; Corie Gray, Renee Carey and Alison Reid, 'Current and Future Risks of Asbestos Exposure in the Australian Community' (2016) 22 *International Journal of Occupational and Environmental Health* 292; Peter Franklin and Alison Reid, 'The Ongoing Problem of Asbestos In Situ' in Asbestos in Australia 261. See also Gary Marsh, Alexander Riordan, Kara Keeton and Stacy Benson, 'Non-Occupational Exposure to Asbestos and Risk of Pleural Mesothelioma: Review and Meta-Analysis' (2017) 74 *Occupational Environmental Medicine* 838; Renyi Xu, Frances Barg, Edward Emmett, Douglas Wiebe and Wei-Ting Hwang, 'Association Between Mesothelioma and Non-Occupational Asbestos Exposure: Systematic Review and Meta-Analysis' (2018) 17.90 *Environmental Health* 1.

- Franklin and Reid confirm that ‘of all the current exposures, renovations and removal are the most likely to be associated with the disease.’³⁸
- Olsen et al conclude that instances of malignant mesothelioma after exposure to asbestos during home renovations are an increasing problem in Western Australia and are likely to continue to be because of the many homes that still contain asbestos building products. Olsen et al call for active steps to be taken to prevent asbestos-related disease in the residential sector.³⁹
- Park et al also conclude that active steps need to be taken to prevent asbestos-related disease in the residential sector.⁴⁰
- Similarly, Gray et al conclude that future cases of asbestos related diseases and mortality can only be prevented by stringent regulation and careful maintenance and removal of existing *in situ* asbestos across the country.⁴¹
- More broadly, Leigh, Driscoll and others note ‘a reluctance to recognize the causal significance of low occupational and non-occupational exposures and a tendency to ignore or discredit the warnings of scientists.’⁴² They also confirm that ‘nearly all human mesothelioma cases result from asbestos ... exposures

³⁸ Peter Franklin and Alison Reid, ‘The Ongoing Problem of Asbestos *In Situ*’ in *Asbestos in Australia* 261. There is evidence that home renovation activities can result in short term high concentrations of asbestos fibres, especially when power tools are used. Such exposure can then be exacerbated by ongoing asbestos dust from major renovations. See, eg, M Greenberg and TA Lloyd Davis, ‘Mesothelioma Register 1967-68’ (1974) 31 *British Journal of Industrial Medicine* 91; Monash University, ‘Measurement of Asbestos Fibres Released During Removal Works in a Variety of DIY Settings’ (Commissioned by the Asbestos Safety and Eradication Agency, March 2016); Peter Franklin and Alison Reid, ‘The Ongoing Problem of Asbestos *In Situ*’ in *Asbestos in Australia* 263-264; SK Brown, ‘Asbestos’ in JD Spengler, JM Samet and JF McCarthy eds, *Indoor Air Quality Handbook* (New York, McGraw-Hill Professional, 2001). Home renovations can occur over many months (and sometimes years). Homeowners and others can be exposed by sleeping and living in rooms with asbestos dust, by DIY work, either alone or alongside professional tradespersons, and during renovation supervision activities.

³⁹ NJ Olsen, PJ Franklin, A Reid, NH de Klerk, TJ Threlfall, K Shilkin and B Musk, ‘Increasing Incidence of Malignant Mesothelioma After Exposure to Asbestos During Home Maintenance and Renovation’ (2011) 195 *Medical Journal of Australia* 271. The authors won the best original research award by the Medical Journal of Australia for this paper.

⁴⁰ Eun-Kee Park, Deborah Yates, Rebecca Hyland and Anthony Johnson, ‘Asbestos Exposure During Home Renovation in New South Wales’ (2013) 199 *Medical Journal of Australia* 410. The Park et al study investigated possible exposures of Australians undertaking home renovations in NSW during the first half of 2008, with participants randomly selected from the NSW electoral roll. Park et al acknowledge the preference of measured actual exposure rather than self-reported exposure, but nonetheless conclude that active steps need to be taken to prevent asbestos related disease in the residential sector.

⁴¹ Corie Gray, Renee Carey and Alison Reid, ‘Current and Future Risks of Asbestos Exposure in the Australian Community’ (2016) 22 *International Journal of Occupational and Environmental Health* 292, 295.

⁴² James Leigh and Tim Driscoll, ‘Malignant Mesothelioma in Australia, 1945-2002’ (2003) 9 *International Journal of Occupational and Environmental Health* 206, 213.

which may be of very small magnitude.’⁴³

- Reid concludes that ‘exposure to asbestos from the general environment, at levels lower than incurred occupationally, has had a catastrophic effect.’⁴⁴

These warnings from independent experts are strongly supported by the plaintiff compensation claims data. More than half of the successful mesothelioma claims made through the Asbestos Injuries Compensation Fund (AICF) during the period 2008-2019 are defined by KPMG (the auditor and actuary of the fund) as arising from home renovation or domestic sources.⁴⁵ These claims encompass professional tradespersons, DIY renovators, and other domestic cases, and the periods of exposure of these claimants vary from long to short.⁴⁶ This AICF data is significant, as the mesothelioma claims paid by the fund in 2019 equated to around 60 percent of the notified mesothelioma diagnoses in Australia.⁴⁷

The KPMG data involving exposure during home renovations may be underrepresented because these claims are especially difficult to demonstrate legally. To succeed, a sufferer must prove the specific location and timing of likely exposure and the manufacturer of the product(s) containing asbestos. This is not always possible when a person has engaged in multiple home renovations and or has left the relevant property.

Generally Accepted Facts

Background Facts

- **Australia was the highest per capita user of asbestos-related products**

⁴³ James Leigh and Tim Driscoll, ‘Malignant Mesothelioma in Australia, 1945-2002’ (2003) 9 *International Journal of Occupational and Environmental Health* 206, 213.

⁴⁴ Alison Reid, ‘Health Outcomes of the Women and Children Who Lived at Wittenoom’ in *Asbestos in Australia* 180.

⁴⁵ KPMG, *Valuation of Asbestos Related Disease Liabilities of Former James Hardie Industries Ltd Entities to be Met by the Asbestos Injuries Compensation Fund* (19 May 2020) 27-28.

⁴⁶ KPMG, *Valuation of Asbestos Related Disease Liabilities of Former James Hardie Industries Ltd Entities to be Met by the Asbestos Injuries Compensation Fund* (19 May 2020) 27-28. The KPMG statistics exclude cases settled by other schemes and uncompensated victims.

⁴⁷ Total mesothelioma claims though the AICF reached a record 430 in 2019 and diagnoses recorded by the Australian Mesothelioma Registry during a similar period were 724: Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (published August 2020).

worldwide from the 1940s to the 1970s.⁴⁸

- **The World Health Organization describes asbestos exposure deaths as known and preventable and warns countries that if they do not stop using asbestos, they face an epidemic of cancer in coming years.**⁴⁹
- **The areas and amounts of naturally occurring asbestos in Australia that present potential risks to the public are very limited.**⁵⁰
- **In contrast, the areas and amounts of asbestos containing materials within public, commercial and residential properties that potentially pose a public health risk are vast.**⁵¹
- **Few Australians have never been exposed to asbestos, so cases with no apparent or known exposures likely involve unrecognised (or forgotten) exposures.**⁵²

Asbestosis

- **Medical scholars highlighted the links between asbestos exposure and asbestosis as early as 1900, with increasing studies published during the 1920s and 1930s (internationally and in Australia).**⁵³
- **The occurrence of asbestosis outside of asbestos industry workers was highlighted in the medical literature in the 1960s.**⁵⁴

⁴⁸ See, eg, *Defending the Indefensible* 30; NSW Government: Cabinet Office, *Report of the Special Commission of Inquiry into the Medical Research and Compensation Foundation* (September 2004) Annexure J 117.

⁴⁹ World Health Organization, 'WHO Calls for Prevention of Cancer through Healthy Workplaces' (Media Release 27 April 2007).

⁵⁰ See, eg, NSW SafeWork, 'Naturally Occurring Asbestos FAQs' viewed 1 December 2020 at

<https://www.safework.nsw.gov.au/resource-library/asbestos-publications/naturally-occurring-asbestos/naturally-occurring-asbestos-faqs2>.

⁵¹ See, eg, N van Zandwick, Glen Reid and A Frank, 'Asbestos-Related Cancers: the "Hidden Killer" Remains a Global Threat' (2020) 20 *Expert Review of Anticancer Therapy* 271, 271.

⁵² See, eg, B Musk, L Gordon, H Alfonso, A Reid, N Olsen, R Mina, P Franklin, S Peters, F Brims, J Hui and N de Klerk, 'Risk Factors for Malignant Mesothelioma in People with No Known Exposure to Asbestos' (2017) 6 *American Journal of Industrial Medicine* 432.

⁵³ See, eg, Morris Greenberg, 'Knowledge of the Health Hazard of Asbestos Prior to the Merewether and Price Report of 1930' (1995) 7 *Social History of Medicine* 493; Christy Barlow, Jennifer Sahmel, Dennis Paustenbach and John Henshaw, 'History of Knowledge and Evolution of Occupational and Regulatory Aspects of Asbestos Exposure Science: 1900-1975' (2017) 47 *Critical Reviews in Toxicology* 286; WE Cooke, 'Fibrosis of the Lungs due to the Inhalation of Asbestos Dust' (1924) 2 *British Medical Journal* 147. See also JV Sparks, 'Pulmonary Asbestosis' (1932) 15 *Medical Journal of Australia* 388.

⁵⁴ See, eg, IJ Selikoff, J Churg and EC Hammond, 'The Occurrence of Asbestosis Among Insulation Workers in the United States' (1965a) 132 *Annual New York Academy of Science* 139.

-
- **While asbestosis is a notifiable disease in Australia, our researchers were unable to find publicly available statistics on the diagnoses and death counts.**

Mesothelioma

- **Australia has the highest per capita levels of mesothelioma in the world.⁵⁵**
- **The latency period⁵⁶ for mesothelioma is 10-50 years.⁵⁷**
- **Most of the pertinent medical knowledge about mesothelioma was published in the 1960s, including the facts that it can occur from low dosages and brief periods of exposure.⁵⁸**
- **Medical researchers confirm that ‘few common cancers have such a direct causal relation with an exposure to a defined carcinogen as mesothelioma has with asbestos exposure – even lung cancer with cigarette smoking’.⁵⁹**
- **Unlike most other diseases, mesothelioma is not associated with smoking or any personal responsibility issues. Most, if not all, mesothelioma sufferers did nothing to contribute to their deaths.**
- **Mesothelioma is incurable and there are no effective long-term treatments.⁶⁰**
- **Mesothelioma has been described by a medical professor as ‘the most terrible cancer known, in which the decline is the most spectacular, the most cruel’.⁶¹**
- **Mesothelioma is a notifiable disease in Australia and diagnoses have been**

⁵⁵ Defending the Indefensible 10.

⁵⁶ Typically defined as the period of exposure from the average exposure date to the time of a diagnosis.

⁵⁷ See Werfel Case [129]. The example of 14-year-old boy diagnosed with mesothelioma suggests the latency period can be as short as ten years. It is unlikely that this boy was exposed before the age of four.

⁵⁸ See, eg, JC Wagner, CA Sleggs, and P Marchand, ‘Diffuse Pleural Mesothelioma and Asbestos Exposure in the Northwestern Cape Province’ (1960) 17 *British Journal of Industrial Medicine* 260; ML Newhouse and H Thompson, ‘Mesothelioma of Pleura and Peritoneum Following Exposure to Asbestos in the London Area’ (1965) 22 *British Journal of Industrial Medicine* 261; J Lieben and H Pistawka, ‘Mesothelioma and Asbestos Exposure’ (1967) 14 *Archives of Environmental Health* 559. See also AW Musk, ‘Milestones in the Knowledge and Treatment of Asbestos Related Diseases’ in *Asbestos in Australia* 137; JC McNulty, ‘Malignant Pleural Mesothelioma in an Asbestos Worker’ (1962) 2 *Medical Journal of Australia* 953.

⁵⁹ BWS Robinson, AW Musk and RA Lake, ‘Malignant Mesothelioma’ (30 July 2005) 366 *The Lancet* 397.

⁶⁰ There are no drugs to treat mesothelioma ‘once a diagnosis is confirmed, much less one that will prevent its development once someone has been exposed to asbestos dust.’: Diseases Contracted Through Home Renovations and Indirect Exposure’ *smh.com.au* (24 November 2017) citing Professor Ken Takahashi, director of the Asbestos Diseases Research Institute.

⁶¹ See also A Vircondelet, *Mortel Aminate* (1998, A. Carriere, France) 15. Vircondelet is a French medical professor.

formally recorded since 1982.⁶²

- **The five-year survival rate for mesothelioma in Australia is 5-6 percent, the lowest such rate among the cancer types recorded by the Australian Institute of Health and Welfare.⁶³ This survival rate has barely moved over the last thirty years.⁶⁴**
- **Multiple published medical sources suggest around 20,000 Australians have died from mesothelioma since 1945.⁶⁵**
- **The recorded mesothelioma diagnoses in Australia rose rapidly from 125 in 1982 to around 700 to 800 in 2012.⁶⁶**
- **From 2012-2019, annual mesothelioma diagnoses and deaths were in the 700-800 range.⁶⁷**
- **Cancer Australia estimates that notified diagnoses of mesothelioma in 2020 will be around 834. If accurate, this level of diagnoses will be 15 percent higher than the reported statistic by the AMR for 2019, and will exceed all prior equivalent levels.⁶⁸**
- **The Cancer Australia 2020 estimate includes record mesothelioma diagnoses for both males and females.⁶⁹**
- **The ages of people dying from mesothelioma in Australia span from 19 to 101,**

⁶² See Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (published August 2020).

⁶³ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2018* 1. See also Australian Government, Australian Institute of Health and Welfare, 'Cancer in Australia 2019' (Cancer 18 Series no 119. Cat no CAN 123, Canberra: AIHW) 78.

⁶⁴ See, eg, Australian Government, Australian Institute of Health and Welfare, *Cancer Data in Australia 2020: Table 3a Survival Summary* (June 2020). The 5-year survival rate improved from 5.5 in 1986 to 6.3 percent in 2016.

⁶⁵ See J Leigh, P Davison, L Hendrie, and D Berry, 'Malignant Mesothelioma in Australia: 1945-2000' (2002) 41 *American Journal of Industrial Medicine* 188; James Leigh and Tim Driscoll, 'Malignant Mesothelioma in Australia, 1945-2002' (2003) 9 *International Journal of Occupational and Environmental Health* 206; M Soeberg, D Vallance, V Keena, Ken Takahashi and J Leigh, 'Australia's Ongoing Legacy of Asbestos: Significant Challenges Remain Even After Complete Banning of Asbestos Almost Fifteen Years Ago' (2018) 15 *International Journal of Environmental Research & Public Health* 383, 382; Asbestos Disease Research Institute, *2019 Annual Report* 6.

⁶⁶ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2018*.

⁶⁷ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (Published August 2020).

⁶⁸ Australian Government, Cancer Australia, 'Mesothelioma in Australia Statistics' viewed 23 June 2021 at <https://mesothelioma-cancer.canceraustralia.gov.au/statistics>.

⁶⁹ Australian Government, Cancer Australia, 'Mesothelioma in Australia Statistics' viewed 23 June 2021 at <https://mesothelioma-cancer.canceraustralia.gov.au/statistics>.

with an average age of diagnosis of 75 in 2019.⁷⁰

- **Outside of Australia, there are recorded incidences of people as young as 14 with mesothelioma.**⁷¹
- **People are dying from mesothelioma in all Australian States and Territories.**⁷²
- **The ‘floating fibres [of asbestos] do not respect job classifications.’⁷³ The backgrounds of people that have died, or are dying, from mesothelioma in Australia are diverse, and include people from all socioeconomic and educational categories.**⁷⁴

Lung Cancer

- **Linkages between asbestos and lung cancer were acknowledged by medical scholars in the 1930s to 1950s.**⁷⁵
- **Asbestos is a contributing and exacerbating risk factor for lung cancer. In 1964, a study by Selikoff et al showed that asbestos workers who smoked had ninety times the risk of developing an asbestos related cancer than non-smokers with no exposure to asbestos.**⁷⁶
- **An updated study on the linkages between asbestos, smoking and lung cancer concludes that any ‘asbestos exposure, even in heavy smokers, contributes to causation’.**⁷⁷
- **A body of medical studies investigate the ratio of cases of lung cancer deaths caused by exposure to asbestos compared to mesothelioma fatalities. These**

⁷⁰ See, eg, Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2018*; Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (Published August 2020).

⁷¹ Werfel Case [130].

⁷² Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (Published August 2020) 6.

⁷³ I J Selikoff, J Churg and E Cuyler Hammond, ‘Asbestos Exposure and Neoplasia’ (1964) 188 *Journal of the American Medical Association* 91, 95.

⁷⁴ See, eg, *Defending the Indefensible* 222-223. See also *Asbestos Cost* 35. Published sources indicate that people who have died or been diagnosed with mesothelioma include plumbers, carpenters, electricians, state governors, federal parliamentarians, judges, veterinarians, architects, academic professors, surgeons, and financial services providers.

⁷⁵ See, eg, R Doll, ‘Mortality from Lung Cancer in Asbestos Workers’ (1955) 12 *British Journal of Industrial Medicine* 81.

⁷⁶ I J Selikoff, EC Hammond and J Churg, ‘Asbestos Exposure, Smoking, and Neoplasia’ (1968) 204 *Journal of the American Medical Association* 106.

⁷⁷ Sonya Klebe, James Leigh, Douglas Henderson and Markku Nurminen, ‘Asbestos, Smoking and Lung Cancer: An Update’ (2020) 17 *International Journal of Environmental Research and Public Health* 258, 258.

study findings vary, with ratios spanning 2.0 to 6.6 times.⁷⁸ Applying these study ratios, the estimated deaths from asbestos-related lung cancer in Australia since 1945 ranges from 40,000 to 132,000.⁷⁹

- **Close to 9,000 people die from lung cancer each year in Australia.⁸⁰ The published medical ratios suggest around 3,000 of these deaths involve asbestos exposure.⁸¹**
- **The actual number of deaths in Australia from asbestos related lung cancer is unknown. Lung cancer deaths are not generally investigated and the causal interactions between asbestos and other factors are complex.⁸²**
- **The average five-year survival rate of lung cancer in Australia is around 19 percent.⁸³ This survival rate has improved by an absolute eight percent over the last thirty years.⁸⁴**

Occupational Exposure

- **Existing and past sufferers of asbestosis, mesothelioma and asbestos-related lung cancer in Australia were exposed, and continue to be exposed, from occupational sources (including males and females).⁸⁵ Occupational exposure to asbestos arises when the primary source of exposure leading to a diagnosis**

⁷⁸ V McCormack, J Peto, G Byrnes, K Straif and P Boffetta, 'Estimating the Asbestos Related Lung Cancer Burden from Mesothelioma Mortality' (2012) 106 *British Journal of Cancer* 575; James Leigh and Tim Driscoll, 'Malignant Mesothelioma in Australia, 1945-2002' (2003) 9 *International Journal of Occupational and Environmental Health* 206; AD LaMontagne, CE Hunter, D Vallance and AJ Holloway, 'Asbestos-related disease in Australia: Looking Forward and Looking Back' (2008) 18 *New Solutions* 361.

⁷⁹ See Asbestos Awareness Australia Ltd, *Asbestos-Related Burdens: Lives Lost* (July 2021).

⁸⁰ Australian Government, Cancer Australia, 'Lung Cancer in Australia Statistics' viewed 17 July 2021 at <https://www.canceraustralia.gov.au/affected-cancer/cancer-types/lung-cancer/lung-cancer-australia-statistics>.

⁸¹ The ASEA estimates 4,000 deaths in Australia each year from asbestos-related diseases. See also 'Global and Regional Burden of Cancer in 2016 Arising from Occupational Exposure to Selected Carcinogens: A Systematic Analysis for the Global Burden of Disease Study 2016' (2020) 77 *Occupational and Environmental Medicine* 151, 152.

⁸² See N van Zandwick, Glen Reid and A Frank, 'Asbestos-Related Cancers: The "Hidden Killer" Remains a Global Threat' (2020) 20 *Expert Review of Anticancer Therapy* 271.

⁸³ See, eg, Australian Government, Australian Institute of Health and Welfare, *Cancer Data in Australia 2020: Table 3a Survival Summary* (June 2020). The 5-year survival rate improved from 5.5 in 1986 to 6.3 percent in 2016; Australian Government, Cancer Australia, 'Lung Cancer in Australia Statistics' viewed 22 September 2020 at <https://www.canceraustralia.gov.au/affected-cancer/cancer-types/lung-cancer/statistics>.

⁸⁴ See, eg, Australian Government, Australian Institute of Health and Welfare, *Cancer Data in Australia 2020: Table 3a Survival Summary* (June 2020).

⁸⁵ See, eg Australian Government, Australian Institute of Health and Welfare, 'Mesothelioma in Australia 2019' (Published August 2020).

of an asbestos-related disease occurs in a workplace setting.

- **Asbestos has been, and continues to be, the most lethal known occupational carcinogen globally.⁸⁶**
- **Asbestos exposure remains the No.1 cause of work-related deaths in the world.⁸⁷**
- **Asbestos-related diseases have likely been the single largest cause of workplace deaths in Australia over the last decade.⁸⁸**

Non-Occupational or Environmental Exposure

- **Existing and past sufferers of mesothelioma in Australia were exposed, and continue to be exposed, from non-occupational sources (including males and females).⁸⁹ Non-occupational or environmental exposure to asbestos arises when the primary source of exposure leading to a diagnosis of an asbestos-related disease occurs in settings that are not workplaces. Such exposure may arise, for example, during home renovations, or in a school or building site, or linked to commercial or public spaces.**
- **Many participants in the AMR survey provide histories of non-occupational sources of exposure to asbestos. Of the 952 survey participants to 2019, nearly 36 percent were assessed as having no occupational exposure and another 52 percent were found to have both occupational and non-occupational exposures.⁹⁰**

⁸⁶ See T Driscoll, D Nelson, K Steenland, James Leigh, M Concha-Barrientos, M Fingerhut and A Pruss-Ustun, 'The Global Burden of Disease Due to Occupational Carcinogens' (2005) 48 *American Journal of Industrial Medicine* 419. This paper finds that lung cancer and mesothelioma account for the most deaths and disability-adjusted life years (DALYs) caused by workplace exposure to carcinogens.

⁸⁷ See, eg, T Driscoll, D Nelson, K Steenland, James Leigh, M Concha-Barrientos, M Fingerhut and A Pruss-Ustun, 'The Global Burden of Disease Due to Occupational Carcinogens' (2005) 48 *American Journal of Industrial Medicine* 419. See also The Mesothelioma Center (US), 'Asbestos-Related Diseases' viewed 4 August 2021 at <https://www.asbestos.com/mesothelioma/related-diseases/>.

⁸⁸ The number of deaths from mesothelioma each year is around 700-800 (so around 7-8,000 fatalities over the last decade). The Asbestos Safety and Eradication Agency estimates total deaths each year from asbestos-related diseases of 4,000 (approximately 40,000 over ten years). Published sources suggest many of these deaths arose from occupational sources. In contrast, the average death count in Australia each year from accidental fatalities in workplaces is 250.

⁸⁹ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (Published August 2020).

⁹⁰ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (published August 2020) 11.

-
- **Medical studies find excess risks of mesothelioma in neighbourhoods, domestic settings, and homes.⁹¹ Marsh et al conclude that mesothelioma risks from non-occupational asbestos exposure are consistent with the fibre-type potency response observed in occupational settings.⁹²**

Exposure During Home Renovations

- **Published material from public health scholars and clinicians confirms that the greatest risks of exposure to legacy asbestos occurs when buildings are renovated or demolished.⁹³**
- **Warnings from public health scholars and clinicians within academic sources on the risks of exposure during home renovations leading to mesothelioma have increased markedly over the last decade.⁹⁴**
- **In contrast, warnings in Australia from public health officials at both federal and state levels remain equivocal, dated, and poorly disseminated.⁹⁵**
- **Many participants in the AMR survey provide histories of home renovation experiences. The most common contexts in which these occurred were the undertaking of major home renovations that involved asbestos products (more than 50 percent), and living in a house undergoing renovations (39 percent).⁹⁶**
- **More than 52 percent of the settled mesothelioma claims with the Asbestos Injuries Compensation Fund from 2008-2019 involved home renovations, with**

⁹¹ Gary Marsh, Alexander Riordan, Kara Keeton and Stacy Benson, 'Non-Occupational Exposure to Asbestos and Risk of Pleural Mesothelioma: Review and Meta-Analysis' (2017) 74 *Occupational Environmental Medicine* 838; Renyi Xu, Frances Barg, Edward Emmett, Douglas Wiebe and Wei-Ting Hwang, 'Association Between Mesothelioma and Non-Occupational Asbestos Exposure: Systematic Review and Meta-Analysis' (2018) 17.90 *Environmental Health* 1.

⁹² Gary Marsh, Alexander Riordan, Kara Keeton and Stacy Benson, 'Non-occupational Exposure to Asbestos and Risk of Pleural Mesothelioma: Review and Meta-Analysis' (2017) 74 *Occupational Environmental Medicine* 838, 845.

⁹³ See, eg, Peter Franklin and Alison Reid, 'The Ongoing Problem of Asbestos In Situ' in *Asbestos in Australia* 261.

⁹⁴ See, eg, NJ Olsen, PJ Franklin, A Reid, NH de Klerk, TJ Threlfall, K Shilkin and B Musk, 'Increasing Incidence of Malignant Mesothelioma After Exposure to Asbestos During Home Maintenance and Renovation' (2011) 195 *Medical Journal of Australia* 271; Eun-Kee Park, Deborah Yates, Rebecca Hyland and Anthony Johnson, 'Asbestos Exposure During Home Renovation in New South Wales' (2013) 199 *Medical Journal of Australia* 410; Corie Gray, Renee Carey and Alison Reid, 'Current and Future Risks of Asbestos Exposure in the Australian Community' (2016) 22 *International Journal of Occupational and Environmental Health* 292, 295; Peter Franklin and Alison Reid, 'The Ongoing Problem of Asbestos In Situ' in *Asbestos in Australia* 261.

⁹⁵ Asbestos Awareness Australia Ltd, *Public Health Risk Warnings On Legacy Asbestos* (June 2021).

⁹⁶ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (published August 2020) 14.

the equivalent statistics rising to 60 percent in 2018 and 55 percent in 2019.⁹⁷

- **Most published work from medical researchers in Australia suggests the composition of mesothelioma sufferers in Australia is broadening, with a significant decrease in the pool of men working in factories and mines with asbestos-containing products and a corresponding increase in the number of male and female sufferers with likely harmful exposure during home renovations.⁹⁸ Our researchers found only one published article that describes ‘the scientific evidence for the existence of the hypothesised third wave as limited’.⁹⁹**

Females Diagnosed with Asbestos-related Diseases.

- **Specific research on female sufferers of asbestos-related diseases is scarce.¹⁰⁰**
- **Studies on the environmental exposure of residents in Wittenoom confirm the excess cancer risks of women and children who worked or lived in Wittenoom.¹⁰¹ Reid concludes that ‘exposure to asbestos from the general environment, at levels lower than incurred occupationally, has had a catastrophic effect.’¹⁰²**

⁹⁷ KPMG, *Valuation of Asbestos Related Disease Liabilities of Former James Hardie Industries Ltd Entities to be Met by the Asbestos Injuries Compensation Fund* (19 May 2020) 27-28. KPMG audits and reports annually on the Asbestos Injuries Compensation Fund.

⁹⁸ See, eg, Peter Franklin and Alison Reid, ‘The Ongoing Problem of Asbestos In Situ’ in *Asbestos in Australia* 261; NJ Olsen, PJ Franklin, A Reid, NH de Klerk, TJ Threlfall, K Shilkin and B Musk, ‘Increasing Incidence of Malignant Mesothelioma After Exposure to Asbestos During Home Maintenance and Renovation’ (2011) 195 *Medical Journal of Australia* 271; Eun-Kee Park, Deborah Yates, Rebecca Hyland and Anthony Johnson, ‘Asbestos Exposure During Home Renovation in New South Wales’ (2013) 199 *Medical Journal of Australia* 410. See also Gary Marsh, Alexander Riordan, Kara Keeton and Stacy Benson, ‘Non-Occupational Exposure to Asbestos and Risk of Pleural Mesothelioma: Review and Meta-Analysis’ (2017) 74 *Occupational Environmental Medicine* 838; Renyi Xu, Frances Barg, Edward Emmett, Douglas Wiebe and Wei-Ting Hwang, ‘Association Between Mesothelioma and Non-Occupational Asbestos Exposure: Systematic Review and Meta-Analysis’ (2018) 17.90 *Environmental Health* 1.

⁹⁹ Bruce Armstrong and Tim Driscoll, ‘Mesothelioma in Australia: Cresting the Third Wave’ (2016) 26 *Public Health Research and Practice* 1, 4.

¹⁰⁰ See, eg, V Panou, M Vyberg, C Meristoudis, J Hansen, M Bogsted, O Omland, U Weinreich, and O Roe, ‘Non-Occupational Exposure to Asbestos is the Main Cause of Malignant Mesothelioma in North Jutland, Denmark’ (2019) 45 *Scandinavian Journal of Work, Environment & Health* 82, 82.

¹⁰¹ See, eg, A Reid, G Berry, J Heyworth, NH de Klerk and AW Musk, ‘Predicted Mortality from Malignant Mesothelioma Among Women Exposed to Blue Asbestos at Wittenoom, Western Australia’ (2019) 66 *Occupational Environmental Medicine* 169. See also Alison Reid, ‘Health Outcomes of the Women and Children Who Lived at Wittenoom’ in *Asbestos in Australia* 175, 178-79, 180.

¹⁰² Alison Reid, ‘Health Outcomes of the Women and Children Who Lived at Wittenoom’ in *Asbestos in Australia* 175, 180.

- Among the female participants in the AMR survey to the end of 2019, 93 percent were assessed as having no known or recognised occupational exposure.¹⁰³ Hence, a high proportion of the sufferers with identified home renovation histories and that were assessed as having no probable exposure sources were likely female.¹⁰⁴
- In 2020, a majority of the estimated diagnoses of mesothelioma were still male. However, the Cancer Australia estimate of 185 female diagnoses is a 34 percent increase on the equivalent statistic published in the 2019 AMR report.¹⁰⁵ Reasons for this marked change in the gender balance are unclear.
- There is evidence of gender biased responses to females when seeking diagnoses of, and compensation for, asbestos-related diseases.¹⁰⁶

Uncertainties & Unknowns

- **When will the number of deaths in Australia from asbestos-related diseases peak?** Prior predictions of peaks in the 1990s, 2000s and 2010s were unduly optimistic and significantly so.¹⁰⁷
- **The reasons why some people develop asbestos-related diseases, while others do not. This conundrum applies to many, if not most, diseases. For example, not all smokers develop lung cancer or other smoking related diseases. Similarly, scientists do not understand why only some people contract COVID**

¹⁰³ Australian Government, Australian Institute of Health and Welfare, *Mesothelioma in Australia 2019* (published August 2020) 11.

¹⁰⁴ Australian Government, Australian Institute of Health and Welfare, *'Mesothelioma in Australia 2019'* (Published August 2020).

¹⁰⁵ Australian Government, Australian Institute of Health and Welfare, *'Mesothelioma in Australia 2019'* (Published August 2020).

¹⁰⁶ See, eg, iMig 2021 abstract.

¹⁰⁷ See, eg, Matt Peacock, *Killer Company* (Harper Collins Publishers, 2009) 84; Gideon Haigh, *Asbestos House: The Secret History of James Hardie Industries* (Scribe Publishing Pty Ltd, Melbourne, 2006) 279. Peacock notes that industry projections were persistently optimistic, with peaks projected by KPMG to occur by 1990 and subsequently in 2010. Both the Australian Chamber of Commerce and Industry and WorkCover NSW strongly objected to estimates given by Dr Leigh in 1996 of 10,000 new cases of mesothelioma and at least 30,000 new cases of other asbestos related diseases by 2020. WorkCover NSW suggested the Leigh data was 'long regarded by actuarial and insurance experts as a gross overestimation' and cited a study that predicted asbestos related deaths would peak by 2000. In fact, Leigh's estimates were significantly understated. From 1996 to 2018, there were more than 15,000 registered mesothelioma diagnoses in Australia. These diagnoses would closely reflect the number of deaths given the short life expectancy for most mesothelioma sufferers.

19, only some of these people become severely ill, and only some transmit the virus to others.

- **Scientific mechanisms for sufferers of asbestos-related diseases or others to precisely establish or confirm the exact timing, source, and duration of exposure to asbestos (especially those exposed from non-occupational sources).** Medical studies that examine non-occupational sources of exposure to asbestos are difficult to design, assess and verify because the exposure settings (including the timing, duration, and intensity of exposure) are highly variable and specific.¹⁰⁸
- The possible confounding of scientific study results because of background exposure to asbestos. When medical studies measure the excess risks of asbestos-related diseases, the control groups are comprised of people from the general population. Expansive production and use of asbestos-containing materials by James Hardie, CSR and others in the 20th century means that most, if not all Australians have been exposed to asbestos fibres to some extent. Hence, **ongoing levels of exposure across the population (typically called the background or incidental rates of exposure) are reflected in the comparative control data and may confound or mask findings classified by scientists as “excess risks” across the population.**

Our Summary & Views

Scientific evidence on the dangers of asbestos exposure to human health and life, the causal linkages between exposure and asbestos-related diseases, the death counts from these diseases, and the sources and levels of exposure leading to asbestos-related diseases, have been well documented and published in scientific material since the 1960s. Indeed, the science on asbestos-related diseases is clearer in many respects than for many other diseases and areas of public health. Most of this evidence on health outcomes, sources of exposure, and the past and present death counts is largely irrefutable.

¹⁰⁸ Further discussion on this topic is provided in a future paper.

Scientific evidence on deadly exposure to legacy asbestos in homes also extends back to the 1960s. Compensation claims data and plaintiff lawyers confirm that a majority of mesothelioma claims since 2008 relate to exposure within homes. Corresponding warnings from public health researchers and others have increased over the last decade. **Consequently, the facts, evidence, and science that necessitate urgent public health and policy action to save lives from asbestos-related diseases in Australian homes are to hand, and have been to hand, for more than a decade.**

To understand the progress and interpretation of asbestos science and the associated debates properly, scientific findings must be viewed within a broad canvas that encompasses the adjoining commercial, political, legal, and academic influences, and objectives. Such a perspective is essential, because the science of asbestos (and the interpretation and dissemination of this science) has always been, and will continue to be, heavily influenced by commercial and political factors.¹⁰⁹

Some industry and other monied interests continue to portray the science on asbestos-related diseases as uncertain or incomplete. As has occurred since the beginning of the asbestos crisis, these vested interests present their carefully selected versions of the science (often based on unsourced and anonymous assertions) to mask the continuing crisis and especially the mass loss of life.¹¹⁰ As McCulloch and Tweedale note, the asbestos industry never had problems finding physicians and epidemiologists ready to argue that the risk of working with asbestos was acceptable.¹¹¹

During the 20th century, the creation and continuation of the asbestos industry in Australia was repeatedly justified on short term commercial and political grounds,

¹⁰⁹ See, eg, *Defending the Indefensible* 49-83. See also Lundy Braun, Anna Greene, Marc Manseau, Raman Singhal, Sophie Kisting and Nancy Jacobs, 'Scientific Controversy and Asbestos: Making Disease Invisible' (2003) 9 *International Journal of Occupational Health and Environmental Health* 194; M Soeberg, D Vallance, V Keena, Ken Takahashi and J Leigh, 'Australia's Ongoing Legacy of Asbestos: Significant Challenges Remain Even After Complete Banning of Asbestos Almost Fifteen Years Ago' (2018) 15 *International Journal of Environmental Research & Public Health* 383 ; James Huff, 'Industry Influence on Occupational and Environmental Public Health' (2007) 13 *International Journal of Occupational Health and Environmental Health* 107, 107..

¹¹⁰ See, eg *Defending the Indefensible* 265.

¹¹¹ *Defending the Indefensible* 265.

with loss of life viewed by those making these gains as a necessary cost of doing business.¹¹² This pattern continues today. Our research suggests anonymous experts (who can be carefully selected or influenced) are still largely determining the acceptable levels of risk and deaths from exposure to legacy asbestos for the Australian community.¹¹³ **The most tragic aspect of this framework is that science or “pseudo-science” is being used as a smokescreen to block or confuse genuine scientific developments and public health debates that serve the public interest.**

While those with short term financial and political capital to protect can hide in the shadows and dominate the policy debates around asbestos matters, tens of thousands more Australians will continue to die from entirely preventable diseases without repercussion or accountability. For open and robust debate to occur on the science of asbestos:

- All contributors or participants need to be clearly identifiable and required to disclose conflicts of interest or relevant external funding.
- All official material on asbestos matters that claims to be scientifically verifiable needs to provide the detailed sources relied upon.
- All asbestos-related scientific and policy debates need to occur in public forums and not behind closed doors.

To the credit of the scientific community, dedicated persons have highlighted the risks of exposure to asbestos, the dire health outcomes, and the undue influence of commercial interests on asbestos matters throughout the crisis period. These scientists deserve high commendation, but more is needed. To prevent continued mass loss of life to asbestos-related diseases during this century and the next, even stronger voices and actions are needed.

¹¹² See, eg, Peta Spender, ‘Blue Asbestos and Golden Eggs: Evaluating Bankruptcy and Class Actions as Just Responses to Mass Tort Liability’ (2003) 25 *Sydney Law Review* 223, 252.

¹¹³ See, eg, Environment Health Standing Committee, *enHealth, Asbestos: A Guide for Householders and the General Public* (February 2013); Asbestos Awareness Australia Ltd, *Public Health Risk Warnings On Legacy Asbestos* (June 2021). The Guide to Householders is not sourced, its contributors are unnamed (other than the chief medical officer), and its content is protected by copyright.

We urge the scientific community to:

- **Systematically rebut the longstanding misconceptions promulgated by anonymous experts and monied interests as scientifically sound.**
- **Speak openly and unequivocally about the substantive risks of exposure to legacy asbestos, especially in Australian homes.**
- **Demand concrete actions and policy reforms to prevent or minimise future incidences of asbestos-related diseases in Australia.**

Asbestos Awareness Australia Ltd

Asbestos Awareness Australia Ltd is a registered not-for-profit company limited by guarantee, is a registered charity, and has endorsement from the Australian Taxation Office as a gift deductible recipient. The company was set up:

- **To enhance public awareness and knowledge of the dangers of asbestos threats.**
- **To promote measures and policies that prevent or minimise the harms from asbestos-related diseases.**

To achieve these objectives, the company provides public access to widely sourced information on asbestos risks and impacts, including the associated medical, legal, and political debates.