Position statement: Occupational Lung Disease in Australia

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About Lung Foundation Australia

Lung Foundation Australia is Australia's leading lung health peak body and national charity. Founded in 1990, we have become the trusted point-of-call for the one in three Australians living with a lung disease, including lung cancer.

We work to ensure lung health is a priority for all, from promoting lung health and early diagnosis, advocating for policy change, programs, and research investment, raising awareness about the symptoms and prevalence of lung disease, and championing equitable access to treatment and care. To support those living with a lung disease we deliver information and support services and facilitate access to peer support and exercise maintenance programs.

As a patient representative charity, we have partnered with patients, health professionals, researchers, medical organisations, and the Australian community to drive reform in the delivery of health services in Australia to benefit more than 7 million Australians impacted by lung disease and prevent even more Australians from developing lung disease.

Key messages

- Occupational lung disease (also known as work-related lung disease) includes a wide variety of lung conditions which are caused by breathing in hazardous agents in the work environment.
- Occupational lung diseases are an under-recognised and preventable cause of respiratory ill health in Australia.
- Current and former workers across many occupations and industries are at risk of occupational lung disease - particularly those with experience working in construction and trades, tunnelling, mining and quarrying, manufacturing, maritime workers, agriculture, and stone benchtop fabrication and installation.
- Lung Foundation Australia believe that everyone has the right to work in an environment free from harm.
- Lung Foundation Australia supports The National Occupational Respiratory Disease Registry (the Registry) which was made operational on the 22nd of May 2024. The aim of the registry is to capture and share data on workplace exposures and the number of occupational respiratory diseases in Australia. This will ultimately help to reduce, eliminate and improve the understanding of preventable occupational respiratory diseases.
- Lung Foundation Australia recommends that the Registry expands its mandatory reporting from Silicosis alone to other occupational respiratory diseases.
- Lung Foundation Australia supports the Engineered Stone Decision Regulatory Impact Statement recommendation to prohibit the use of all engineered stone.
- Lung Foundation Australia makes recommendations under the following six priority areas:
    1. Workplace risk reduction aligned to the Hierarchy of Controls.
    2. Education and awareness.
    3. Health monitoring, screening, and surveillance.
    4. Consistent and cross-jurisdictional governance.
    5. Research and development.
    6. Provide support to those with an occupational lung disease.

Summary

There are many hazardous agents, including dust, fumes, and gases, found in the work environment, that when breathed in, can cause lung conditions known as occupational lung diseases. Occupational lung diseases contribute to 13.6 million disability adjusted life years (in 2016) and present a largely avoidable burden to the Australian economy through increased costs for the healthcare system, income replacement, lost productivity, and workers' compensation payments. This position statement outlines Lung Foundation Australia's stance on the leading causes of occupational lung disease. In this Statement we present a summary of what occupational lung disease is, what impact these diseases have on an individual's health and wellbeing, current applicable legislation and standards, and our policy recommendations to reduce the impacts of occupational lung diseases. We also make a number of recommendations to protect workers from occupational lung diseases. Lung Foundation Australia will continue to advocate for these recommendations at a State/Territory and Federal level and monitor emerging trends and evidence in support of protecting workers' lung health.

What are Occupational Lung Diseases?

The term occupational lung disease (also known as work-related lung diseases) covers a wide variety of different lung conditions which are caused by breathing in dust, fumes, gases, and other hazardous agents in the work environment. These diseases vary greatly in their nature, depending on the hazardous agent and protective measures implemented to reduce or manage a worker's exposure. They may be acute or chronic, malignant or non-malignant, or infectious.

Anyone who is exposed to a hazardous agent/s at work is at risk of developing an occupational lung disease. It may not only be people working directly with hazardous agents, but also employees who are exposed by working near hazardous agents, such as administration staff. The risk of developing an occupational lung disease may continue even after exposure to the hazardous agent ends, as some types of these diseases may take years to develop. This is known as a long latency period. Certain industries such as agriculture, building and construction, and mining have long been known to contribute to the development of occupational lung disease. However, the burden of occupational lung disease is prone to change over time, due to the continuous introduction of new products to market with potential unknown effects on lung health.

Table 1 lists the more common occupational lung diseases and the hazardous agents associated with them. There are several main types of occupational lung diseases, including:

- Pneumoconiosis, the general term for lung fibrosis, or lung scarring, caused by inhalation of dust. Examples include asbestosis, silicosis, and coal worker's pneumoconiosis.
- Lung cancers and mesothelioma.
- Occupational lung infections, viral or bacterial infections that are caused by work conditions or practices. Examples include pneumonia and tuberculosis.
- Hypersensitivity pneumonitis, a lung condition caused by an immune response/reaction to an inhaled dust or a substance, often referred to as an allergen, resulting in lung inflammation. Examples include farmer's lung and miller's lung.
- Work-related asthma, caused by inhaling dust, fumes, gases or other potentially hazardous agents while at work, making the airways inflamed and irritable.
- Chronic Obstructive Pulmonary Disease (COPD) causes narrowing of the bronchial tubes in the lungs making it difficult to breathe.

Hazardous agents associated with occupational lung diseases can include dusts, gases, fumes, smoke, mists, microorganisms, or vapours. We note that this is not an exhaustive list of occupational lung diseases and/or hazardous agents.

Table 1. Occupational hazards and associated lung diseases.

Occupational Lung Disease	Definition	Hazardous agent typically associated with disease
Asbestosis	Asbestos fibres lodge in the lung tissue, causing inflammation and scarring in the lungs. Some people can live a long time with asbestosis, but for others, the disease may progress at a faster rate. People who have asbestosis are at an increased risk of lung cancer. Symptoms do not usually develop until many years after exposure to asbestos, in some cases up to 10 to 30 years after exposure has occurred.	Asbestos fibres - Asbestos is a group of naturally occurring minerals. They were popular in building products from 1940-1987. In Australia, around 1 in 3 homes contain asbestos products which are most commonly found in roofing, walls, and vinyl, carpet and tile underlay. The World Health Organization's International Agency for Research on Cancer (IARC) categorises asbestos as a class 1 carcinogen.
Mesothelioma	A type of cancer that affects the mesothelium, a thin tissue membrane covering internal organs of the body. 90% of all mesotheliomas are pleural – affecting the mesothelium around the lungs. However, some can occur in the abdomen (known as abdominal mesothelioma) and very rarely, elsewhere.	
Silicosis	inflammation which over time, leads to scarring of the lung tissue. This causes stiffening of the lungs, which can make it difficult to breathe. Exposure to silica dust can also cause: ▪ COPD ▪ Lung cancer ▪ Scleroderma and other autoimmune conditions ▪ An increased risk of infections such as tuberculosis and fungal diseases.	Silica dust - Silica dust is generated when silica-containing materials are cut, crushed, drilled, ground, polished, sanded, sawed, or disturbed with force. The IARC categorises silica as a class 1 carcinogen.
Coal worker's pneumoconiosis (or black lung disease)	A reaction in the lungs, including inflammation, which can lead to scar tissue or small masses of tissue forming. In instances of heavy coal dust exposure, it can develop into Progressive Massive Fibrosis, where there are large areas of scar tissue in the lungs.	Coal dust - Anyone working with or around coal could be at risk, this includes in the mining and tunnelling industries.
Diffuse dust-related fibrosis (or diffuse dust fibrosis or coal mine dust-related diffuse fibrosis)	A type of Pneumoconiosis - a reaction in the lungs, including inflammation, which can lead to scar tissue or small masses of tissue forming.	
Mixed-dust pneumoconiosis	A type of Pneumoconiosis - as above.	Exposure to more than one hazardous dust.
Aluminosis (or aluminium lung)	A type of Pneumoconiosis - as above.	Aluminium-bearing dust - Workers may be exposed to aluminium during bauxite refining, aluminium casting, and production of waterproofing materials, fireworks, ceramics, glass, building materials, and textile dyeing products.

Berylliosis (or chronic beryllium disease)	A type of Pneumoconiosis - as above.	Beryllium dusts or vapours - Beryllium is a metallic element used in many industries, including electronics, high-technology ceramics, metals extraction, and dental alloy preparation.
Byssinosis (or brown lung disease)	A type of Pneumoconiosis - as above.	Dust from vegetable fibres - Vegetables such as flax, hemp or cotton.
Hard metal pneumoconiosis (or hard metal lung disease)	A type of Pneumoconiosis - as above.	Dust from hard metals - hard metals such as tungsten, tungsten carbide and cobalt.
Talcosis	A type of Pneumoconiosis - as above.	Talc dust e.g. working with talc during its production or industrial use.
Welder's lung	A type of Pneumoconiosis - as above.	Welding fumes (e.g., iron dust, oxidized metals such as Aluminium, cobalt, copper, etc.)- The IARC categorises welding fumes as a class 1 carcinogen.
Bird fancier's lung	A type of hypersensitivity pneumonitis - an immune response/reaction to an inhaled substance resulting in lung inflammation.	Bird feathers and droppings.
Bagassosis	A type of hypersensitivity pneumonitis – as above.	Mouldy sugar cane.
Farmer's lung	A type of hypersensitivity pneumonitis - as above.	Mould that grows on hay, straw or grain.
Humidifier lung	A type of hypersensitivity pneumonitis - as above.	Fungus growing in humidifiers, air conditioners and heating systems.
Hot tub lung	A type of hypersensitivity pneumonitis - as above.	Bacteria in the water vapour from hot tubs, particularly indoor hot tubs.
Miller's lung	A type of hypersensitivity pneumonitis - as above.	Mouldy grain, flour or dust.
Legionella pneumonia	A lung infection caused by inhaling legionella bacteria.	Legionella bacteria - bacteria found in water systems in an occupational setting and occasionally in other water systems such as evaporative conditioners. It typically affects people involved in maintaining hot water pipes, reservoirs, pumps or fountains and can also spread to the community.
Zoonotic diseases	A lung infection that causes "flu-like" symptoms, and psittacosis, which causes pneumonia.	These typically affect workers who have close contact with animals (Q-fever) or birds (psittacosis).
Pneumonia	A potentially fatal lung infection.	Can be caused by viruses, bacteria or fungi. Pneumococcal pneumonia, is caused by the bacterium Streptococcus pneumoniae, can occur in welders as a result of metal fumes.
Tuberculosis	A bacterial disease that most affects the lungs.	In an occupational setting, the risk is primarily in healthcare workers, but may also occur in people who work in crowded environments, such as in prisons.
Work-related asthma (occupational asthma) or Work-exacerbated asthma - worsening of existing asthma due to occupational factors	A chronic lung disease caused by inflammation and muscle tightening around the airways, which makes it harder to breathe.	Dust, fumes, gases, or other potentially hazardous agents - There are more than 2,000 known substances which can cause work-related asthma, and more are being described every year.

Impacts of Occupational Lung Disease

Occupational lung diseases have a major impact on the health of Australians. Symptoms can vary depending on the type of occupational lung disease. Many occupational lung diseases are progressive and incurable. Depending on the type of hazardous agent a person is exposed to, symptoms may develop immediately or in months, years, or even decades after exposure.

Recently, there has been a re-emergence of silicosis and coal workers' pneumoconiosis from exposure to dusts from cutting engineered stone and from coal mine dust exposure[1,2]. This has been due to inadequacies of hazard recognition and utilisation of appropriate control measures, but also failings of occupational respiratory health surveillance practices[3]. Furthermore, deaths from asbestosis continue to increase[2]. Asbestosis has a long latency period but also continues to pose a risk through the impact of legacy products: approximately one in three buildings in Australia contain asbestos products[4]. Any home built or renovated prior to the ban of asbestos products in December 2003 is likely to contain asbestos products.

Occupational lung disease is under-recognised in Australia, and there is limited data available on disease prevalence. However, international studies have shown that approximately 15% of adult-onset cases of asthma and COPD are related to occupational exposures, and, importantly, 10-30% of cases of lung cancer[5]. One quarter of working people with asthma either have their asthma caused by their work or made worse by their working conditions[2].

Data from the 2016 Global Burden of Disease study revealed that globally, 13.6 million disability adjusted life years (DALYs) from chronic respiratory disease were due to occupational airborne exposures[6]. This includes an estimated 0.58 million DALYs for pneumoconiosis, 2.3 million DALYs for asthma and 10.7 million DALYs for COPD[1]. Regionally, Oceania had one of the highest global rates of death from COPD, asthma, and pneumoconiosis arising from occupational exposures[6]. Australia has a rate of malignant mesothelioma among the highest in the world, and the legacy of past occupational asbestos exposure remains a heavy burden[7].

In addition to the death and disability caused by occupational lung diseases, there are substantial impacts on society. Occupational lung diseases present a burden to the Australian economy through increased costs for the healthcare system, income replacement, lost productivity, and workers' compensation payments[8]. From the most recent data available for Australia (2012–13), a conservative estimate suggests work-related injury and disease cost the Australian economy $61.8 billion (4.1% of GDP)[9]. In 2020-21, the health system spending (hospitals, primary health care, and referred medical services) on Asbestosis was $14million, $2million for Silicosis and other pneumoconiosis, and $34million on mesothelioma[10]. As occupational lung diseases are entirely preventable, a large proportion of these costs could be saved through the reduction of exposure to hazardous agents in the workplace[6].

Current legislation and standards

Work health and safety (WHS) in Australia is a shared responsibility between governments, employers, and workers, as set out in the Safe Work Australia Act[11]. Safe Work Australia is an Australian Government statutory agency responsible for developing national policy to improve WHS and workers' compensation arrangements across Australia[12]. It is the responsibility of the government to implement, regulate, and enforce WHS laws and administer workers' compensation schemes in their jurisdictions.

Under the model WHS laws (consisting of the model WHS Act, model WHS Regulations and model Codes of Practice), a person conducting a business or undertaking has a duty to eliminate or manage the risk of occupational lung diseases by[13]:

- Identifying the hazards and assessing the risks
- Managing the risks of occupational lung disease
- Monitoring and reviewing controls implemented for occupational lung disease

Health monitoring is a statutory requirement under WHS laws. Health monitoring is provided by a person conducting a business or undertaking for a worker. It involves using medical tests to monitor and protect a worker's health because of exposure to hazardous agents[14].

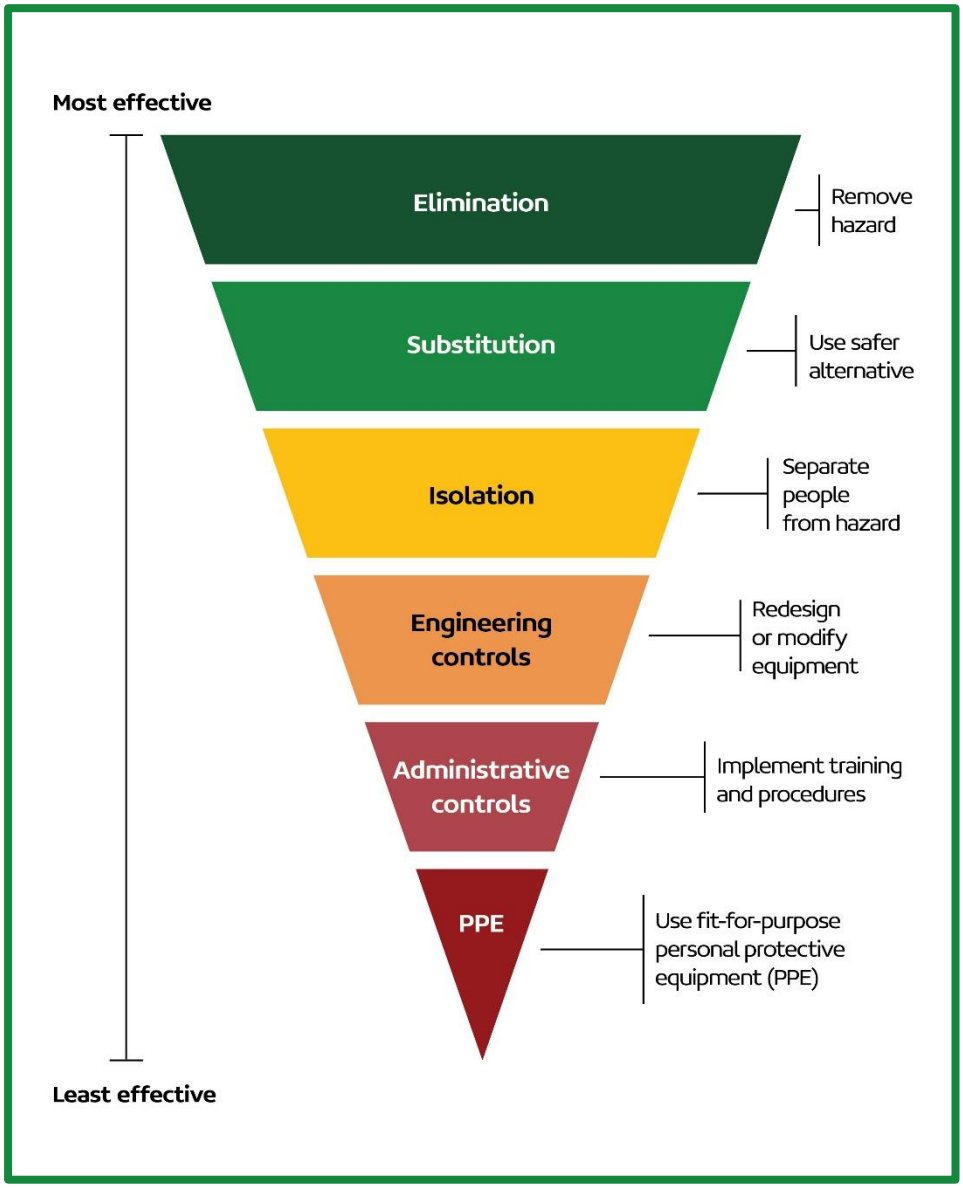
The most effective way to manage the risk of occupational lung disease is to eliminate the hazardous agent/s from the workplace[13]. Where it is not possible to eliminate the hazardous agent/s, the risk must be minimised. The Hierarchy of Controls has long been used as a means of managing the risks of occupational lung disease in Australia (see Figure 1).

Many hazardous agents have Workplace Exposure Standards which need to be adhered to and some hazardous agents have additional legislation, for example:

- The use of asbestos containing materials has been banned in Australia since 2003.
- The manufacture, supply, processing, and installation of engineered stone products (a product containing high levels of silica) including benchtops, panels, and slabs will be banned in all states and territories starting on July 1, 2024; with some state and territories employing a transitional period.
- Workplace Exposure Standards exist for some airborne contaminants, such as crystalline silica, welding fumes, and isocyanates.

The Australian Government recently made positive steps towards reducing preventable occupational lung diseases by passing legislation to establish the National Occupational Respiratory Disease Registry (the Registry)[15]. The Registry was passed by Australian Parliament on 13 October 2023 and became operational in May 2024. The Registry will capture information on the diagnosis and exposing agent of the occupational lung diseases in Australia. The purpose of the Registry is to reduce and eliminate preventable occupational respiratory diseases through early detection, intervention, and prevention activities.

Figure 1. The Hierarchy of Control measures, image from Lung Foundation Australia.



Lung Foundation Australia recommendations

To protect workers from occupational lung diseases, Lung Foundation Australia has six areas of recommendations: workplace risk reduction; education and awareness; health monitoring, screening, and surveillance; consistent and cross-jurisdictional governance; research and development; and, providing support to those with an occupational lung disease.

1. Workplace risk reduction

Everyone living in Australia has the right to work in an environment free from harm. In line with the Hierarchy of Controls, eliminating exposure or further exposure to the hazardous agent/s is the most effective way to reduce the risk of occupational lung disease. Lung Foundation Australia recommends activities that prevent occupational lung diseases from occurring, such as banning hazardous agents when necessary. In addition to Workplace Exposure Standards which need to be adhered to, we recommend:

- Strengthening WHS measures to give greater protection to workers.
- Supporting employers to effectively manage the risks posed by exposure to hazardous agent/s in the workplace, comply with WHS duties and implement safe systems of work.
- Conducting more audits to determine compliance with existing occupational, health and safety regulations.
- Eliminating exposure to hazardous agent/s in Australian workplaces.
- Ensuring the multi-sector and multidisciplinary workforce required to remove hazardous products in Australia is suitably trained, resourced, and distributed.

2. Education and awareness

A lack of awareness of hazardous agents and appropriate control measures can lead to reduced adherence to WHS control measures. Lung Foundation Australia recommends:

- Increasing funding to support the continuation and expansion of awareness campaigns for at risk workers and industries. Lung Foundation Australia have been facilitating a silica prevention campaign since 2023, with funding to continue until 2025. However there is a need for funding to widen this scope and incorporate education campaigns for a wider range of hazardous agents and occupational lung disease.
- Increasing awareness and knowledge of the risks of hazardous agent/s in all sectors.
- Increasing knowledge of safe work practices and compliance with WHS duties.
- The development and delivery of free education programs for employers and employees to support them to identify and mitigate hazards specifically related to exposure in the workplace to dust, gas and fumes. This includes the inclusion of resources to support education in settings such as TAFE and apprenticeships.
- Influencing stakeholder behaviours across the supply chain to reduce exposure to hazardous agent/s and better protect workers.
- Educating health professionals to assist in identification, diagnosis, and management of occupational lung diseases.

3. Health monitoring, screening, and surveillance

Health monitoring and screening is important as it leads to earlier diagnoses which subsequently enables earlier interventions to protect the health of the worker. Continued

health surveillance for workers, even after leaving at-risk industries, is particularly important for occupational lung diseases with a longer latency period e.g. silicosis.

Lung Foundation Australia supports the recommendations of the National Dust Disease Taskforce Final Report[16] that will improve the prevention and early detection of occupational lung diseases, including the Registry.

Lung Foundation Australia further recommends:

- Improving the quality, frequency, coverage, and consistency of health monitoring and surveillance for current and former exposed workers across all state and territories.
- Enhancing evidence-based screening and surveillance to optimise health outcomes for Australian workers.
- Implement and expand the Registry to other occupational respiratory diseases not just silicosis. The following common occupational lung diseases should be included as a priority—Asbestos, Coal worker's pneumoconiosis, COPD, Hypersensitivity pneumonitis, Mesothelioma, Work-related asthma, and occupational lung infections. Over time, we recommend all occupational respiratory diseases found in the Safe Work Australia List of Deemed Diseases in Australia[17] be prescribed and require notification to the Registry on diagnosis
- Exploring the addition of occupational exposure as an inclusion criterion to Australia's targeted National Lung Cancer Screening program.

4. Consistent and cross-jurisdictional governance

A national approach across every state and territory in Australia is recommended to protect workers, regardless of where they live, from exposure to hazardous agents. The establishment of a robust governance mechanism is required across Australia where effective engagement from employers, employees, and representative organisations will be critical to success.

Lung Foundation Australia recommends:

- Establishing a cross-jurisdictional governance mechanism to coordinate and monitor a comprehensive national program of reform and preventative measures, designed to fundamentally address the risks facing workers in industries that generate hazardous agents.
- Driving greater consistency across jurisdictions in WHS policy, practices, behaviours, and information.

5. Research and development

There are still important gaps in knowledge regarding the prevention, management, and epidemiology of many occupational lung diseases.

Lung Foundation Australia recommends:

- Developing a strategic national approach to occupational lung disease prevention research and development, supported by appropriate funding mechanisms.
- Building the evidence base for occupational lung disease prevention as well as the capability of the research sector.

- Enhancing the capabilities of population-level monitoring and surveillance of occupational lung diseases in Australia.
- Translating occupational lung disease knowledge into WHS policy, practices, behaviours and information to better protect workers from exposure to hazardous agent/s.
- Providing subsidies for retooling and retraining displaced workers.
- Gathering more data on the incidence and prevalence of occupational lung diseases.

6. Provide support to those with an occupational lung disease

For those impacted by occupational lung disease we strongly advocate for accessible, confidential, free, and tailored information and support. This includes managing the associated physical and mental health burden and the financial impacts of these diseases. Lung Foundation Australia recommends that:

- Support services available for those living with an occupational lung disease are established to facilitate languages other than English, to support the culturally and linguistically diverse communities working in these at-risk industries.
- The Australian Government has invested in support services for people with silicosis and their carers. For example, Lung Foundation Australia provides free telephone-based nurse and social worker support for people living with silicosis. This type of investment needs to be sustained and expanded to other occupational lung diseases as the impact is broader than silicosis alone.

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