

ASBESTOS-RELATED DISEASE INDICATORS



May 2014



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Safe Work Australia

Asbestos-related Disease Indicators

May 2014

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Abbreviations

ABS	Australian Bureau of Statistics
ACIM	Australian Cancer Incidence and Mortality Books
AIHW	Australian Institute of Health and Welfare
AMR	Australian Mesothelioma Registry
ASEA	Asbestos Safety and Eradication Agency
CCV	Cancer Council Victoria
ICD	International Classification of Diseases
NCSCCH	National Cancer Statistics Clearing House
NDS	National Data Set for Compensation Based Statistics
NHMD	National Hospital Morbidity Database
NHMRC	National Health and Medical Research Council
NSW	New South Wales
WHC	Workers Health Centre

Report summary

This is the third Safe Work Australia report on *Asbestos-related Disease Indicators*. Although asbestos is associated with a range of diseases, only mesothelioma and asbestosis have been used to describe the extent of asbestos-related disease in Australia in this report. For other diseases (e.g. lung cancer), it is not possible to pinpoint asbestos exposure as the sole cause of the disease and therefore estimate the contribution of asbestos to the prevalence of these diseases. Asbestosis is caused exclusively by asbestos and asbestos is the only known cause of mesothelioma.

This report uses data from a variety of sources including: the Australian Institute of Health and Welfare for the number of new cases of mesothelioma, the number of deaths attributed to mesothelioma and the number of asbestosis-related hospitalisations; the New South Wales Dust Diseases Board and the National Data Set for Compensation-based Statistics for the number of accepted workers' compensation claims for mesothelioma and asbestosis; and the Australian Bureau of Statistics for cause of death data. Although compensated cases of mesothelioma and asbestosis have been accepted as work-related, not all new cases, deaths and hospitalisations linked to asbestos diseases are work-related.

Changes in the nature of occupational exposure

- In the past, exposure to asbestos fibres usually occurred while mining asbestos, manufacturing asbestos containing products or using those products, primarily while constructing buildings.
- Currently, the main source of exposure to asbestos fibres is old buildings undergoing renovation or demolition where building maintenance and demolition workers are employed.

Mesothelioma

- The annual number of new cases of mesothelioma increased from 156 in 1982 to a peak of 674 in 2007. The number of new cases declined slightly to 667 in 2010.
- Mortality data shows the annual number of deaths resulting from mesothelioma increased from 416 in 1997 to 606 in 2011.

Asbestosis

- Between 1998–99 and 2009–10 there were 1394 asbestosis-related hospitalisations, 97 percent of which were of male patients.
- There were 102 accepted asbestosis-related compensation claims in 2011, the lowest number observed since 2002.
- Asbestosis was the underlying cause of 125 deaths in 2011.

Prevention policy

- In December 2011 Safe Work Australia Members and the Ministerial Council approved two Codes of Practice relating to asbestos: *How to Safely Remove Asbestos* (Safe Work Australia 2011a) and *How to Manage and Control Asbestos in the Workplace* (Safe Work Australia 2011b).

Introduction

Asbestos-related diseases are responsible for an increasing number of deaths in Australia. In 2011, the most recent year covered by this publication, 606 deaths were caused by mesothelioma and 125 deaths were caused by asbestosis. The number of deaths caused by lung cancer and other diseases possibly related to asbestos exposure is unknown.

In most cases mesothelioma and asbestosis deaths are the direct result of work-related exposure to asbestos fibres up to 40 years ago. Asbestos is a mineral rock made up of masses of tiny fibres and occurs in a number of forms, three of which were used commercially in Australia. They are amosite, crocidolite and chrysotile.

Asbestos was mined in Australia for over 100 years until it ceased in 1983. The domestic production, combined with asbestos imports, gave rise to Australia having the world's highest per-capita use of asbestos in the 1950s (Leigh & Driscoll 2002). This high rate of usage reflected the very useful thermal and mechanical properties of the material. Asbestos had extensive use in a multitude of domestic and industrial products, particularly in fibre-cement products like pipes, wall panels, and roof sheeting. The use and importation of all forms of asbestos (with a few very specialised exceptions) was prohibited in Australia from December 2003.

When asbestos is mined or processed or when asbestos-based products are sanded, sawn or drilled, it can form a fine airborne dust made up of tiny fibres. These fibres are easily breathed into the lungs where they can become embedded. Due to the small size and elongated shape of the fibres, they can resist the lungs' natural cleaning process and may cause serious health problems in later years. In particular, the fibres can work their way through the lungs' tissues and into the pleura—the membrane surrounding the lungs.

In addition to mesothelioma and asbestosis, asbestos has been linked to other diseases including lung cancer, laryngeal cancer and ovarian cancer (IARC 2012). Unlike mesothelioma and asbestosis, however, it is not possible to pinpoint asbestos exposure as the sole cause of these diseases and thereby estimate the contribution of asbestos to their prevalence. Therefore, only mesothelioma and asbestosis have been used to provide indicators of asbestos-related diseases in this report.

Besides this report, Safe Work Australia has undertaken a number of initiatives to better monitor and improve the understanding of asbestos-related diseases.

These include:

- The publication of the *Mesothelioma in Australia* report: a detailed examination of diagnosis and deaths data collected by cancer registries and the Australian Bureau of Statistics (ABS).
- The establishment of the Australian Mesothelioma Registry (AMR), which replaces the Australian Mesothelioma *Register* that operated from 1986 to 2007. The AMR was launched in April 2010 and is funded by Safe Work Australia and Comcare and managed by a consortium led by the Cancer Institute of New South Wales. The AMR publishes annual statistical reports about mesothelioma patients' exposure to asbestos and incidence and mortality statistics.
- Research examining exposure to asbestos among construction workers and their attitudes, perceptions and behaviours relating to asbestos (*Asbestos Exposure and Compliance Study of Construction and Maintenance Workers*, January 2010).

1

Asbestos-related diseases

Exposure to asbestos

Asbestos has been used for thousands of years in pottery, fabrics and other artefacts. During the Industrial Revolution in the nineteenth century, it was used extensively for its insulation and fire retardant qualities (Greillier & Astoul 2008). The association between asbestos and respiratory illness among asbestos workers was suspected by the medical profession as early as the beginning of the twentieth century. The health risks posed by asbestos fibres were scientifically confirmed in the early twentieth century (NHMRC 2013).

Changes in the nature of occupational exposure

To prevent further exposure to asbestos fibres and asbestos containing materials, national, state and territory governments have developed and imposed strict regulations on its use and handling (see 'Prevention policy' on page 11 for further information).

The end of asbestos mining in Australia in the early 1980s and the national ban on asbestos production, importation and use in December 2003 brought about a change in the way workers were and still are exposed to asbestos. In the past, exposure to asbestos fibres usually occurred while mining asbestos, manufacturing asbestos containing products or using those products, primarily while constructing buildings.

Currently, the main source of exposure to asbestos fibres are old buildings undergoing renovation or demolition where building maintenance and demolition workers are employed. Home owners renovating their own homes are also at risk of exposure to asbestos fibres. This is an outcome of the heavy reliance on asbestos products in buildings during the 1950s, 1960s and 1970s (Safe Work Australia 2013a). Asbestos containing materials were used as thermal insulation for pipes, ducts in buildings, plant and furnaces, ceilings and wall cavities. Asbestos cement sheets and roofing were also used extensively.

Occupations

The burden of asbestos-related disease in occupations associated with asbestos mining in Australia should diminish in the longer term because of the cessation of asbestos mining in 1983. However, the widespread use of asbestos in construction and manufacturing until the 1990s may mean there will be more as yet undiagnosed cases of asbestos-related diseases among workers from these two industries.

Between 1986 and 2007, the Australian Mesothelioma Register collected and monitored data on the number of new cases of mesothelioma and past exposure to asbestos. The register shows that in the past workers with the highest rates of mesothelioma were those who had worked in occupations associated with asbestos mining or dust forming operations such as handling, sawing, sanding, grinding, drilling, turning or general maintenance and renovation. Specific occupations recording high numbers of exposed workers included: Carpenters & joiners; Wittenoom workers; Builders & builders' labourers; Navy & merchant navy workers; Railway workers; Boiler makers (cleaners, attendants, installers and welders); and Power station workers.

The National Data Set for Compensation-based Statistics (NDS) contains information from 2000–01 onwards on workers' compensation claims that involve work-related disease. Between 2008–09 and 2010–11p, the NDS data shows 63 percent of compensated mesothelioma claims were made by Tradespersons & related workers and Labourers & related workers.

Over the three-year period, occupation groups with higher than average rates of compensated mesothelioma claims included: Carpentry & joinery tradespersons; Electricians; Freight & furniture handlers; Metal fitters & machinists; and Construction & plumbers assistants.

Over the same period, 73 percent of compensated asbestosis claims were made by Tradespersons & related workers and Labourers & related workers. Occupation groups with higher than average rates of compensated asbestosis claims included: Freight & furniture handlers; Carpentry & joinery tradespersons; Electricians; Metal fitters & machinists; and Sea transport professionals.

Onset of asbestos-related disease

Extent of exposure

Asbestosis and other asbestos-related diseases usually only occur following lengthy periods of exposure to high levels of asbestos fibres. Mesothelioma, on the other hand, can develop from short or lengthy periods of low or high concentrations of asbestos, although exposure to asbestos fibres does not make the development of the disease inevitable.

Onset of disease

It can take up to 40 years or more after initial asbestos exposure for disease caused by asbestos to become evident. Each asbestos-related disease differs in the extent of exposure to asbestos fibres and time between exposure and the onset of disease.

- **Benign pleural disease** takes at least seven years to develop following exposure to asbestos fibres and is only evident on chest x-rays. It generally causes no symptoms and does not require any treatment other than cessation of smoking and regular check-ups with a health professional.
- **Asbestosis** usually takes around 10 years or more to develop following heavy and prolonged exposure to asbestos (NHMRC 2013) before the disease advances to a stage where symptoms become apparent. Although it is a chronic rather than a fatal disease, it is a serious condition that can lead to death from other causes such as respiratory or cardiac failure. Ongoing medical treatment is necessary to maintain good quality of life and to reduce the burden it places on the body's vital organs. People with asbestosis have a greater risk of developing lung cancer or mesothelioma than other people who have been exposed to asbestos fibres.
- **Lung cancer** can take 20 years or more to develop and asbestos is only one of many agents linked to its development (WHC 2011). It is reported to occur only following levels of exposure similar to those for asbestosis and is strongly associated with workplace exposure to asbestos fibres (Queensland Health 2002). It is much more likely to occur in people who smoke and/or who have asbestosis (CCV 2011).
- **Mesothelioma** has the longest latency of any asbestos-related disease, usually taking between 20 and 40 years or more to develop. Symptoms of the disease usually only become evident when the disease has progressed to an advanced stage when treatment is ineffective and necessarily focussed on maintaining good quality of life for as long as possible.

2 Mesothelioma

The condition

Mesothelioma is a fatal cancer of the mesothelium—the membrane lining that protects vital organs such as the lungs, heart and abdomen. The mesothelium is made up of two layers of membrane containing a lubricating fluid that allows the organs to move within the chest (for example, contraction and expansion of the lungs). The disease is strongly associated with asbestos and can usually be traced back to past exposure to asbestos fibres, particularly to amphibole (blue and brown) asbestos (CCV 2011; Leigh & Driscoll 2002).

Although the time between exposure to asbestos and the onset of mesothelioma is usually between 20 and 40 years, once the disease develops it spreads very rapidly and generally before symptoms become apparent. Therefore, early diagnosis and treatment are very difficult (NHMRC 2013). This rapid onset usually results in a survival period following diagnosis of only 6 to 18 months. However, the development of an early diagnostic test using an electronic nose to help detect mesothelioma in its early stages, when it is potentially treatable, may increase survival in future (Chapman et al. 2012).

There are three main types of mesothelioma and these are named according to where the cancer occurs in the body—mesothelioma of the pleura (chest), peritoneum (abdomen) and pericardium (heart). Pleural mesothelioma is the most common form (representing 93 percent of cases of mesothelioma since 1982), followed by peritoneal and pericardial. Mesothelioma can also develop in other parts of the body such as the reproductive organs, but these types are more uncommon.

New cases

Australia has one of the highest incidence rates of mesothelioma in the world. This can largely be attributed to the extensive use of all types of asbestos fibres in various settings in the past (Leigh & Driscoll 2002).

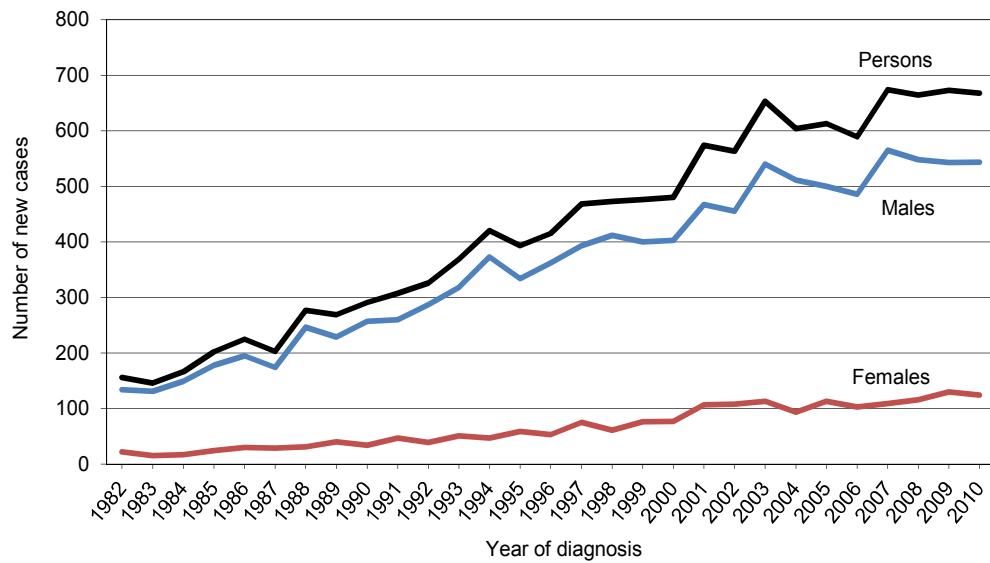
Despite the comparatively high rates of diagnosis and death, mesothelioma is still a relatively rare condition, accounting for 0.6 percent of all cancers diagnosed in Australia in 2009. Mesothelioma is a disease that most often occurs among older people, mainly because of the long latency period between exposure to asbestos and the development of the disease. However, there were 27 cases of mesothelioma diagnosed in people aged under 30 between 1982 and 2010. Men are more likely to be diagnosed with mesothelioma than women and have accounted for 84 percent of cases since 1982.

The number of new cases peaked at 674 in 2007

Figure 1 presents data from the Australian Institute of Health and Welfare (AIHW), which shows an upward trend in the total number of new cases of mesothelioma diagnosed, increasing from 156 in 1982 to a peak of 674 in 2007. The number of new cases decreased slightly to 667 in 2010.

The AMR provides the most recent mesothelioma incidence data, which are derived from notifications of new cases by jurisdictional cancer registries. The AMR data shows the number of new cases of mesothelioma was 639 in 2011 and 619 in 2012 (AMR 2013). However, the number of new cases in 2012 is likely to increase because some mesothelioma diagnoses from that year may yet to be reported (AMR 2013).

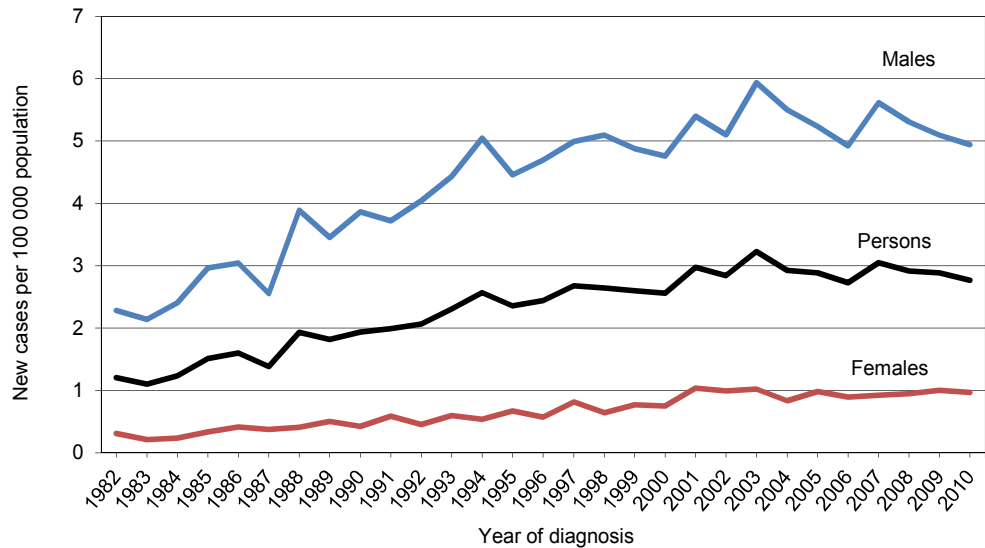
Figure 1 New cases of mesothelioma: year of diagnosis by sex, 1982 to 2010



Source: AIHW Australian Cancer Incidence and Mortality Books (compiled by AIHW from data supplied by state and territory cancer registries).

Figure 2 shows the age-standardised incidence of new cases of mesothelioma (per 100 000 population) over the period 1982 to 2010. The overall incidence rate increased over the period from a low of 1.1 new cases per 100 000 population in 1983 to a maximum of 3.2 in 2003. Since that date, the rate has fallen to 2.8 in 2010.

Figure 2 New cases of mesothelioma: age-standardised incidence rate by sex, 1982 to 2010



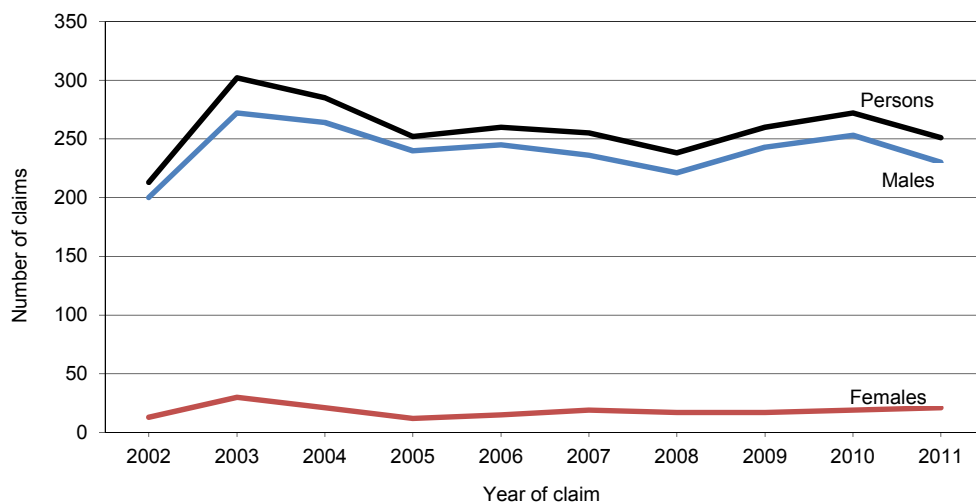
Note: Age-standardisation is a method used to improve comparability of data over time.

Source: AIHW Australian Cancer Incidence and Mortality Books (compiled by AIHW from data supplied by state and territory cancer registries).

Figure 3 shows the combined number of claims for mesothelioma compensated by the New South Wales (NSW) Dust Diseases Board and state, territory and Commonwealth workers' compensation schemes from 2002 to 2011p. The number of compensated claims decreased from 272 in 2010 to 251 in 2011p, but has remained relatively stable over the 10-year period with an average of 259 claims compensated each year. Compensated claims for females have remained stable at an average of 18 each year.

There were 251 compensated claims for mesothelioma in 2011

Figure 3 Compensated mesothelioma claims: number by sex, 2002 to 2011p



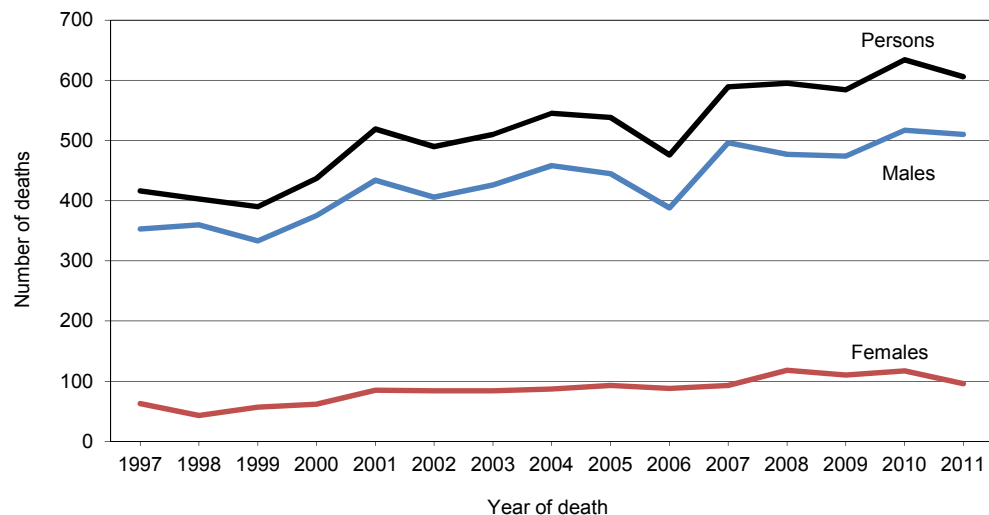
Note: Workers' compensation data for 2011 are preliminary.
Sources: NSW Dust Diseases Board and NDS.

Deaths

Between 1997 and 2011, 83 percent of mesothelioma deaths were of males

Figure 4 shows that the overall number of deaths resulting from mesothelioma has increased since 1997 and peaked at 634 in 2010. Since 2010, the number of registered deaths has fallen to 606 (2011). Most of the decedents are male; over the 15-year period, 83 percent of mesothelioma deaths were of males. This is consistent with males making up 84 percent of new diagnoses of mesothelioma.

Figure 4 Deaths due to mesothelioma: year of death by sex, 1997 to 2011^(a)



(a) Data for 2011 are based on year of registration, not year of death. Data for 2009 and earlier are final while data for both 2010 and 2011 may be further revised.

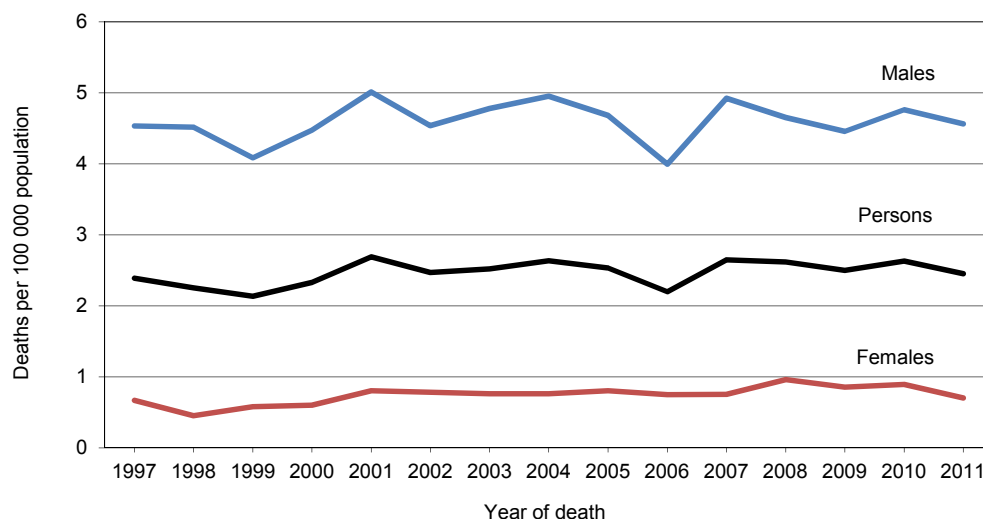
Note: Data on the number of mesothelioma deaths are only available from 1997 when the World Health Organisation International Classification of Diseases (ICD) allocated mesothelioma a unique code (it had previously been grouped with other cancers of the pleura). In contrast, the number of new cases of mesothelioma diagnosed each year is available from 1982 because it is a disease notifiable by legislation to state and territory cancer registries who release this data to AIHW.

Source: AIHW Australian Cancer Incidence and Mortality Books (compiled by AIHW from data supplied by state and territory cancer registries).

The age-standardised death rate has remained relatively stable over 15 years

Figure 5 shows the overall age-standardised rate of death due to mesothelioma has remained relatively stable over the 15 years for which data are available. Over the period, the standardised rate has ranged between a minimum of 2.1 deaths per 100 000 in 1999 and a maximum of 2.7 in 2001. The standardised rate in 2011 was 2.5 deaths per 100 000 population.

Figure 5 Deaths due to mesothelioma: age-standardised mortality rate by sex, 1997 to 2011^(a)



(a) Data for 2011 are based on year of registration, not year of death. Data for 2009 and earlier are final while data for both 2010 and 2011 may be further revised.

Note: Age-standardisation is a method used to improve comparability of data over time.

Source: AIHW Australian Cancer Incidence and Mortality Books (compiled by AIHW from data supplied by state and territory cancer registries).

Data sources

All cases of cancer in Australia (except basal cell and squamous cell carcinomas of the skin) are notifiable by legislation to state and territory cancer registries. These registries report to the National Cancer Statistics Clearing House (NCSCH), which is operated by the AIHW in collaboration with the Australasian Association of Cancer Registries.

The cause of every Australian death is certified by a medical practitioner and recorded on a death certificate. Death certificates are required by state and territory registrars of births, deaths and marriages under jurisdiction-specific legislation. On behalf of the registrars, these data are assembled, coded to the underlying cause of death, and released by the ABS. The data are released to the AIHW and published on the AIHW website.

The NSW Dust Diseases Board records the number of compensation claims for mesothelioma in NSW. Although representing only one state, NSW accounts for around one-third of the Australian population and may be considered an important resource for estimating the incidence of asbestosis in Australia.

The NDS contains workers' compensation data that are received annually from Australian workers' compensation authorities.

3 Asbestosis

The condition

Asbestosis is a chronic lung disease caused by the inhalation of large numbers of asbestos fibres over an extended period. Symptoms of the disease typically appear about 10 years after initial exposure to asbestos fibres, a much shorter latency period than for mesothelioma. However, unlike the rapid development of mesothelioma after onset, asbestosis is a disease that progresses slowly.

Asbestosis is characterised by the formation of scar tissue (fibrosis) around inflammation caused by asbestos fibres lodged deep within the lungs. As the disease progresses, the scarred lung tissue hardens, making it increasingly difficult for the lungs to expand and contract, consequently making it more difficult to breathe. This leads to shortness of breath on exertion, or a dry cough or chest pain. As the disease progresses, this becomes more extreme, even when not exercising (WHC 2011).

There is no cure for asbestosis, only treatment to relieve the symptoms. Although asbestosis does not usually directly cause death, it may be the underlying cause of death in people diagnosed with the condition because the reduced lung function places great stress on the body's vital organs. Many deaths among people diagnosed with asbestosis are caused by respiratory or cardiac failure. In addition, people with asbestosis also have a greater likelihood of developing lung cancer or mesothelioma.

New cases

Unlike mesothelioma, asbestosis is not a notifiable disease so the number of new cases diagnosed each year is unknown. This report uses the number of asbestosis-related hospitalisations, the number of compensation claims for asbestosis accepted by the NSW Dust Diseases Board and the number of accepted workers' compensation claims for asbestosis as indicators for the prevalence of the disease in the community. Although compensated cases of asbestosis have been accepted as work-related, hospitalisations for asbestosis are not necessarily work-related. However, the degree of exposure to asbestos fibres necessary for asbestosis to develop was usually only found in workplace environments.

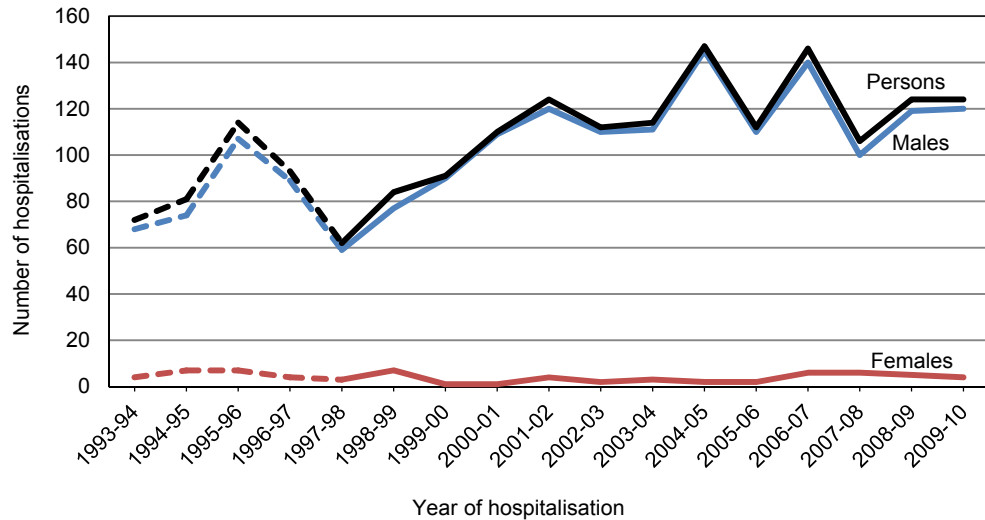
Figure 6 shows the number of hospitalisations attributed to asbestosis has varied over the period 1993–94 to 2009–10. However, care should be taken when interpreting the data because they include people who may have been admitted to hospital more than once. Asbestosis often leads to other serious conditions so people with the disease may be admitted to hospital for other illnesses not coded as related to asbestosis.

Males represent 97 percent of asbestosis-related hospitalisations

The number of hospitalisations ranged from a minimum of 62 in 1997–98 to a maximum of 147 in 2004–05. The rise and fall in numbers each year is consistent with chance variation when reporting small numbers. Asbestosis is a disease that predominantly affects men because it was usually men who worked in those occupations exposed to high levels of asbestos fibres. Over the period 1998–99 to 2009–10, there were 1394 asbestosis-related hospitalisations, 97 percent of which were of male patients.

The decline from 1995–96 to 1997–98 coincided with a change in the way diseases were coded internationally (see ‘Explanatory notes’ on page 13 for further information). The changes to the coding of diseases and the associated switch from manual to automated coding are likely to have been factors in the decline. In addition, changes and advances in the treatment of asbestosis, such as home-based treatment with oxygen, may have also reduced the overall number of hospitalisations related to asbestosis.

Figure 6 Hospitalisations for asbestosis: number by sex, 1993–94 to 2009–10



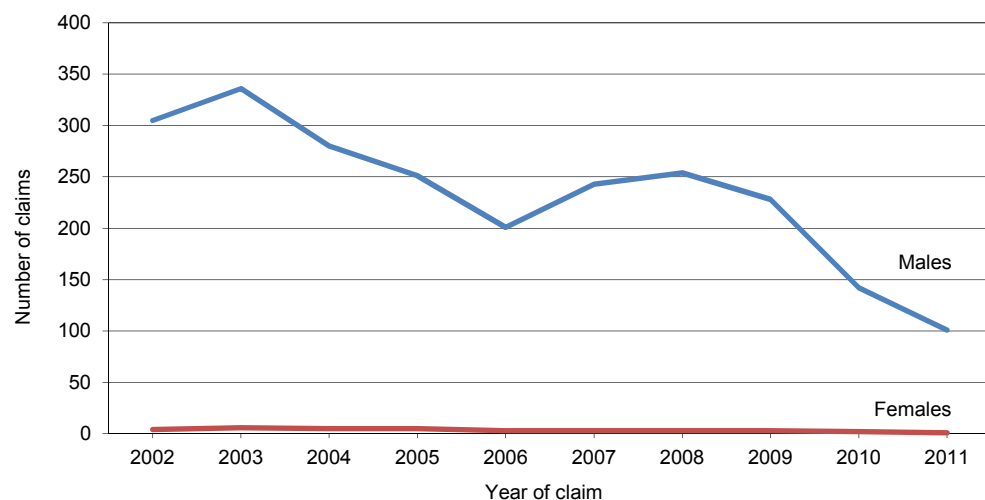
Note: The dotted line indicates data were coded under ICD9 system while the solid line indicates data were coded under ICD10-AM system.

Source: AIHW National Hospital Morbidity Database.

Male asbestosis-related compensations fell from 336 in 2003 to 101 in 2011

Data from the NSW Dust Diseases Board and the state, territory and Commonwealth workers’ compensation schemes (the NDS) have been combined to produce another measure of the prevalence of asbestosis in Australia. Figure 7 shows the number of male asbestosis-related compensations decreased from 336 in 2003 to 101 in 2011p, the lowest number recorded over the period. Between 2002 and 2011p, fewer than 10 female asbestosis-related compensations were recorded each year.

Figure 7 Compensated claims for asbestosis: number by sex, 2002 to 2011p



Note: Workers’ compensation data for 2011 are preliminary.

Sources: NSW Dust Diseases Board and NDS.

Deaths

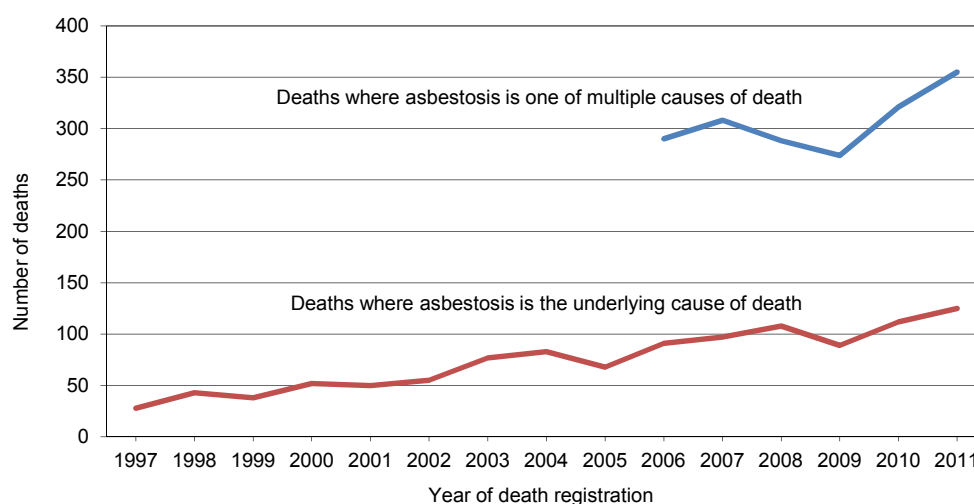
Asbestosis caused
125 deaths in 2011

The ABS reports underlying causes of death and multiple causes of death. An underlying cause is the “disease or injury which initiated the train of morbid events leading directly to death” and “multiple causes are all causes and conditions reported on the death certificate that contributed to, were associated with, or were the underlying cause of the death” (ABS 2013).

In 2011, asbestosis was recorded as one of multiple causes of death in 355 cases and the underlying cause of death in around one-third (125) of those cases. These data reflect a common characteristic of asbestosis—sufferers do not usually die of the disease itself, but of other serious conditions triggered by the disease.

Figure 8 shows an upward trend in the number of deaths where asbestosis was the underlying cause, increasing from 28 in 1997 to a peak of 125 in 2011. Likewise, there appears to be an increase in the number of deaths where asbestosis is one of multiple causes of death.

Figure 8 Asbestosis-related deaths: 1997 to 2011



Note: Data where asbestosis was recorded as one of multiple causes of death are only available from 2006.

Source: ABS Causes of Death data.

Data sources

The number of people diagnosed with asbestosis each year is unknown because, unlike mesothelioma, the disease does not have to be notified to jurisdictional authorities. However, there are four data sources that can provide an indication of the prevalence of asbestosis in the general population:

- The AIHW compiles national hospitalisation data on the number of hospital stays where the patient was recorded as having asbestosis.
- The NSW Dust Diseases Board records the number of compensation claims for asbestosis in NSW. Although representing only one state, NSW accounts for around one-third of the Australian population and the NSW Dust Diseases Board is an important resource for estimating the incidence of asbestosis in Australia.
- The ABS Causes of Death data can identify the number of deaths registered in a year where asbestosis was recorded as a cause of death.
- The NDS contains workers' compensation data received annually from Australian workers' compensation authorities.

4 Prevention policy

Bans on the mining, manufacture, sale and use of asbestos and products containing asbestos began in the 1970s and most uses of asbestos were phased out by the mid-1980s. On 31 December 2003, with the introduction of the prohibition on chrysotile asbestos, materials containing all forms of asbestos were no longer able to be imported, manufactured, supplied, stored, transported, sold, used, reused, installed or replaced in Australia (Safe Work Australia 2010b). The prohibition bans all new uses of asbestos, but does not require removal of asbestos products that were in place (in situ) on 31 December 2003. Therefore, some asbestos products are still present and need regulation to ensure management or removal does not result in exposure to airborne asbestos fibres.

The model work health and safety laws were adopted by the Australian Capital Territory, the Commonwealth, New South Wales, Northern Territory and Queensland on 1 January 2012, and South Australia and Tasmania on 1 January 2013 (Safe Work Australia 2013b). Victoria and Western Australia have yet to pass the model legislation. The model regulations for asbestos aim to provide a consistent framework for the minimisation of exposure, the removal of asbestos and the management of remaining asbestos materials in workplaces. The Safe Work Australia website contains further information on the model work health and safety laws.

Despite the ban on the importation of asbestos, some asbestos materials may continue to be imported into the country unintentionally. Importers or retailers who suspect they may have products that contain asbestos are required to inform their state or territory workcover authority immediately. The suspect materials are to be tested by a National Association of Testing Authorities accredited testing facility.

According to the *Model Work Health and Safety Code of Practice—How to Manage and Control Asbestos in the Workplace* (Safe Work Australia 2011b), “although the ultimate goal of this prohibition is for all workplaces to be free of asbestos, it is only when these materials are being replaced or where they present a health risk that non-asbestos alternatives must be used”. Therefore, asbestos products that were in situ on 31 December 2003 may only be replaced by products that do not contain asbestos.

The substantial risk to workers from exposure to asbestos fibres necessitates strict adherence to work health and safety guidelines when working with in-situ asbestos. A Safe Work Australia report titled *Asbestos Exposure and Compliance Study of Construction and Maintenance Workers* (Safe Work Australia 2010a) determined current levels of awareness, compliance with legislation attitudes and levels of exposure to asbestos. The study found although most construction and maintenance tradespersons were aware of the potential health risks of asbestos, this was not accompanied by a knowledge of how to recognise asbestos containing materials. It also found most tradespersons in the study thought they were protecting themselves adequately against exposure, but were not generally complying with safety procedures as well as they believed. The study also found there was inappropriate disposal of asbestos and asbestos-contaminated materials. The results of this report will be used to assist in the development of better strategies to eliminate, or reduce, worker exposure to asbestos. For more information, a copy of the report can be downloaded from the Safe Work Australia website.

The Commonwealth Government established the Asbestos Safety and Eradication Agency (ASEA) to focus on asbestos-related issues at the national level. The formation of the ASEA was one of the recommendations of the *Asbestos Management Review* report, which examined a range of issues relating to asbestos identification, management, storage, disposal and information.

Another recommendation of the *Asbestos Management Review* related to the development of a national strategic plan. The ASEA is consulting with Commonwealth, state and territory stakeholders as well as non-government stakeholders to ensure the goals and outcomes in the plan are realistic and achievable. The plan will be aimed at preventing exposure to asbestos fibres and eradicating asbestos-related diseases in Australia. Once finalised, the plan will be available on the ASEA website.

Along with developing the national strategic plan, the ASEA also undertakes research and awareness activities, which will support the plan, including an examination of current disposal infrastructure and a study of community awareness and attitudes to asbestos.

Further information on asbestos can be found by searching for 'asbestos' on the Safe Work Australia website as well as the relevant contacts listed below.

Contacts

Table 1 List of Australian jurisdictional authorities

Jurisdiction	Contact	Website
Australian Capital Territory	WorkSafe ACT	www.worksafe.act.gov.au/health_safety
National	Comcare	www.comcare.gov.au
	National Offshore Petroleum Safety and Environmental Management Authority	www.nopsema.gov.au
	Seacare	www.seacare.gov.au
New South Wales	NSW Dust Diseases Board	www.ddb.nsw.gov.au
	NSW Workers' Compensation Commission	www.wcc.nsw.gov.au
	WorkCover NSW	www.workcover.nsw.gov.au
Northern Territory	NT WorkSafe	www.worksafe.nt.gov.au
Queensland	Office of Fair and Safe Work Queensland	www.justice.qld.gov.au
	Q-Comp	www.qcomp.com.au
South Australia	SafeWork SA	www.safework.sa.gov.au
	WorkCover SA	www.workcover.com
Tasmania	WorkCover Tasmania	www.workcover.tas.gov.au
	Workplace Standards Tasmania	www.wst.tas.gov.au
Victoria	Victorian WorkCover Authority	www.workcover.vic.gov.au
Western Australia	WorkCover WA	www.workcover.wa.gov.au
	WorkSafe WA	www.worksafe.wa.gov.au

Table 2 List of other relevant agencies

Agency	Website
Asbestos Safety and Eradication Agency	http://asbestossafety.gov.au
Australian Chamber of Commerce and Industry	www.acci.asn.au
Australian Council of Trades Unions	www.actu.asn.au
Australian Industry Group	www.aigroup.com.au
Australian Mesothelioma Registry	www.mesothelioma-australia.com
Safe Work Australia	www.safeworkaustralia.gov.au
Western Australian Mesothelioma Register	www.australianasbestosnetwork.org.au/Medical+Information/Asbestos+Research/Epidemiological+Research/WA+Mesothelioma+Register/default.aspx

Explanatory notes

Several data sources were used in the preparation of this report and they are summarised below:

- Compensation
 - National Data Set for Compensation-based Statistics (NDS)
 - NSW Dust Diseases Board (DDB)
- Australian Institute of Health and Welfare (AIHW)
 - Australian Cancer Incidence and Mortality Books (ACIM)
 - National Hospital Morbidity Database (NHMD), and
- Australian Bureau of Statistics (ABS).

Table 3 Summary of data sources

Condition	Data item	Source
Mesothelioma	Number of new cases of mesothelioma	ACIM
	Age-standardised incidence of mesothelioma	ACIM
	Number of compensated mesothelioma-related claims	NDS & DDB
	Number of deaths attributed to mesothelioma	ACIM
	Age-standardised mesothelioma death rates	ACIM
Asbestosis	Number of compensated asbestosis-related claims	NDS & DDB
	Hospitalisations for asbestosis	NHMD
	Number of deaths attributed to asbestosis	ABS

Compensation

National Data Set for Compensation-based Statistics

The NDS data used in this report comprised all accepted workers' compensation claims lodged in the reference year.

NDS data are based on information received annually from Australian workers' compensation authorities. The data supplied includes both new data for the most recent year available and updated data for the five years prior. Because some claims lodged in the most recent year may not be accepted until the following year, the number of accepted claims reported lodged in the most recent year is likely to increase by about 3 percent when updated.

The NDS is the only national data set that provides information on workers' compensation claims that involve work-related disease. For a claim to be accepted, the workers' compensation authorities require the connection between workplace and disease be made by a medical practitioner. This may lead to considerable under-reporting of occupational disease in the NDS. The reader should also note that claims data are based on date of lodgement of claims which is usually closer to the date of diagnosis than the date of exposure. Further information on the NDS can be found on the Safe Work Australia website.

NSW Dust Diseases Board

The NSW DDB provides statutory, no-fault compensation to NSW workers disabled by dust diseases resulting from exposure to dusts in the workplace. One of the NSW DDB's responsibilities is to maintain a database of "statistical and related data to facilitate actuarial valuations of the liabilities of the Dust Diseases Scheme and research into dust diseases" (NSW DDB 2010).

The NSW DDB provided Safe Work Australia with data on the number of compensated claims awarded to workers disabled by asbestos-related diseases for each calendar year from 2002 to 2011. The NSW DDB data is an important source of data on asbestosis because, apart from NDS data, there is little data available to Safe Work Australia to estimate asbestosis prevalence in Australia.

Common law claims

Not all claims for compensation are made through workers' compensation schemes. Many claims for compensation are pursued through common law courts and an unknown number of these are settled before ever going to trial. Consequently, the number of asbestos-related disease compensation claims reported from the NDS and the NSW DDB in this report does not represent the total number of compensation claims accepted for these diseases in Australia.

Compensation claims may be pursued through the common law process instead of through workers' compensation schemes when, for example:

- greater entitlements are offered than through workers' compensation
- self-employed workers are not covered by workers' compensation
- workers are exposed to asbestos at multiple workplaces
- negligent employers have gone out of business
- self-employed workers seek compensation from manufacturers of asbestos products responsible for their exposure, and
- it can be proven asbestos exposure was the result of negligence by another party.

Australian Institute of Health and Welfare

Australian Cancer Incidence and Mortality

The AIHW ACIM books are interactive Excel workbooks comprising cause-specific Australian cancer incidence and mortality information for the most recent years and historically for some cancer data from 1968. Individual workbooks have been created for selected cancers.

Cancer (except basal cell and squamous cell carcinomas of the skin) is a notifiable disease in all Australian jurisdictions and, by law, data on every cancer diagnosis must be collected and reported to state and territory cancer registries who release this information to the AIHW National Cancer Statistics Clearing House (NCSCH). The ACIM books use data from the NCSCH for the number of new cases of mesothelioma diagnosed each year.

The ABS provides AIHW with the cause of death data contained in the ACIM books. Cause of death data are collected by the state and territory registrars of births, deaths and marriages who then provide this data to the ABS for coding and compilation into national statistics.

The ACIM book for mesothelioma contains incidence data from 1982 to 2010 and mortality data from 1997 to 2011. Data on the number of deaths each year are from 1997 when mesothelioma was allocated a distinct code in the tenth revision of the International Classification of Diseases (ICD)—previously, mesothelioma had been included with other cancers of the pleura.

Deaths information for asbestosis contained in this workbook were sourced electronically from the ABS website.

National Hospital Morbidity Database

The hospitalisation data used in this report were downloaded from the AIHW website's online data cubes. The source of these data is the NHMD. This database, compiled by the AIHW from data supplied by the state and territory health authorities, is a collection of records of admitted public and private hospital patients.

The AIHW NHMD contains diagnosis and treatment information for hospitalisations of admitted patients from almost all public and private hospitals in Australia starting from the financial year 1993–94.

Age-standardised rates

Age-standardisation is a technique used to remove the influence of gradual shifts over time in the age and sex composition of the Australian population on rates calculated using those figures. By applying the age-specific incidence or death rates in each year to a standard population, the expected number of deaths can be calculated and an aggregate, age-standardised rate can be calculated.

Australian Bureau of Statistics

The ABS data used in this report have been obtained from the Causes of Death data published on their website.

In Australia, it has been compulsory since the mid-nineteenth century for information on all deaths to be certified by a medical practitioner and the details conveyed to state and territory registrars of births, deaths and marriages. The registrars release these data to the ABS for determining and coding the underlying (or main cause) and multiple (or contributing) causes of death into national statistics. Causes of death are coded under the ICD system.

World Health Organisation International Classification of Diseases

The ICD is a World Health Organisation maintained classification system used internationally to code causes of death and illness since the early twentieth century. To date, there have been 10 versions of the coding system, with each subsequent version expanding because of medical science's better understanding of diseases. Often, revisions include changes in the coding rules aimed at improving comparability of data within and between countries over time.

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