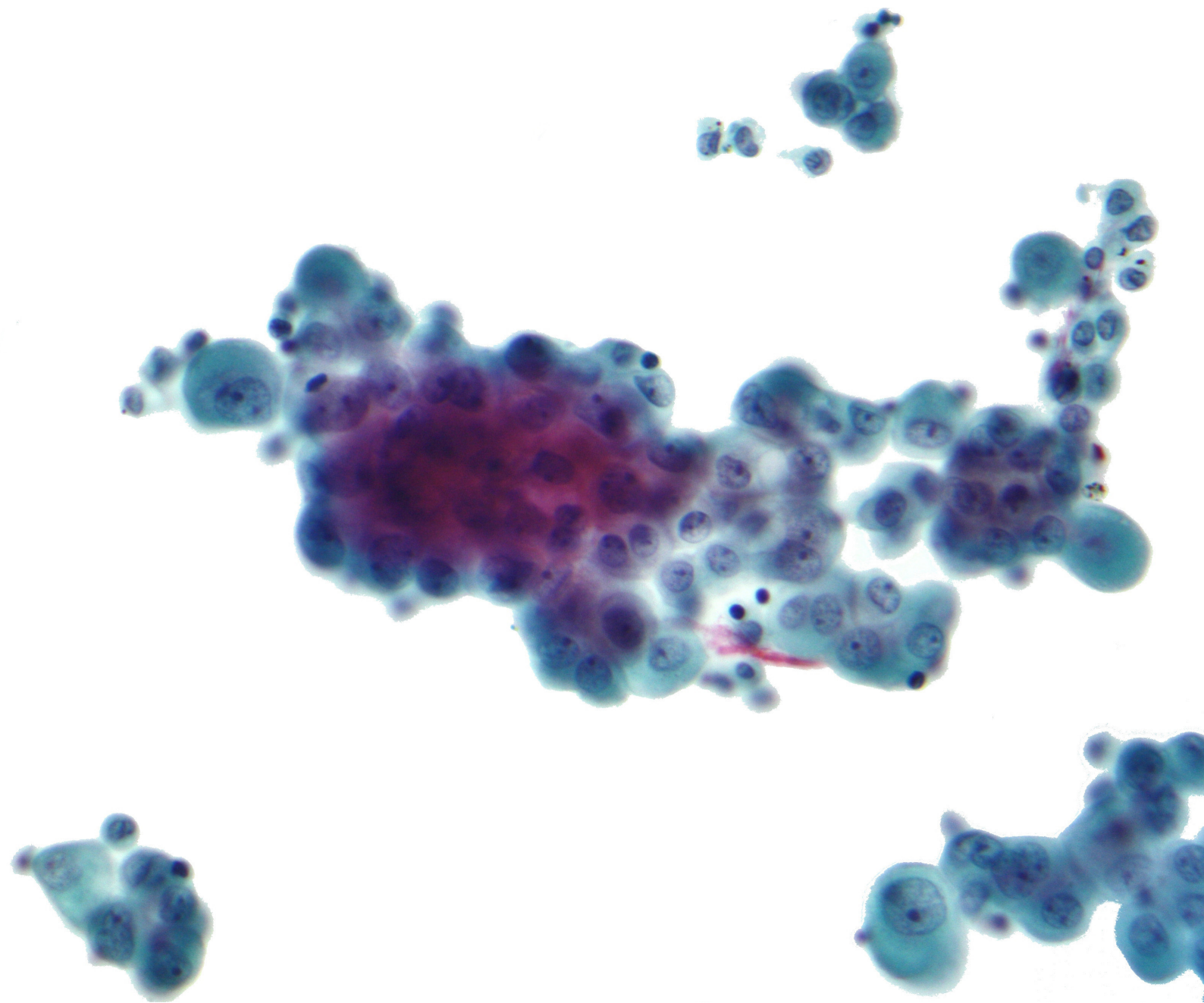


australian
mesothelioma
registry



3rd Annual Report
Mesothelioma in Australia 2013

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- Asbestos Diseases Research Institute
- Workers' Compensation Dust Diseases Board of New South Wales
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- Queensland Cancer Registry

The authors would like to thank the state and territory cancer registries for the provision of incidence and mortality data, and for undertaking patient recruitment for the asbestos exposure data collection. The Australian Institute of Health and Welfare (AIHW) are also acknowledged for conducting linkage of AMR data to the National Death Index (NDI).

Abbreviations and acronyms

ABS	Australian Bureau of Statistics
ACD	Australian Cancer Database
ACM	asbestos-containing material
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
AMR	Australian Mesothelioma Registry
ANZSCO	Australian and New Zealand Standard Classification of Occupations
HRF	Hunter Research Foundation
JSM	job-specific module
MonCOEH	Monash Centre for Occupational and Environmental Health
NDI	National Death Index
N.E.C.	not elsewhere classified
NOHSC	National Occupational Health and Safety Commission
n.p.	not published
NSW	New South Wales
NT	Northern Territory
OccIDEAS	Occupational Integrated Database Exposure Assessment System
Qld	Queensland
SA	South Australia
Tas	Tasmania
TWA	time-weighted average
Vic	Victoria
WA	Western Australia

Executive summary

The Australian Mesothelioma Registry (AMR) became operational in 2011 and contains information about people diagnosed with mesothelioma in Australia from 1 July 2010.

The AMR also has a voluntary component that enables the collection of asbestos exposure information directly from people who have mesothelioma.

Number of new cases

As at 31 May 2014, the AMR had received 575 notifications of people newly diagnosed with mesothelioma between 1 January and 31 December 2013. Of these people, 465 were males and 110 were females, and the majority (80.0%) were aged 65 years or over at the time of diagnosis. The annual age-specific incidence rates of mesothelioma peaked at 7.5 per 100,000 in females 80–84 years of age and 42.3 per 100,000 in males 80–84 years of age.

For 2013 diagnoses, the most common subtype of mesothelioma was the epithelioid subtype (46.8%). The most common location was the pleura (93.9%).

An additional 33 people with mesothelioma were notified to the AMR following the publication of the AMR's 2012 report. This has increased the previously reported number of diagnoses for 2012 from 619 to 652. A similar increase is likely to be seen in the reported number of patients diagnosed in 2013.

Age-standardised incidence rates

The age-standardised mesothelioma incidence rate in 2013 for males and females combined was 2.2 cases per 100,000 person-years.

The male age-standardised incidence rate declined between 2012 and 2013, from 4.6 per 100,000 to 3.9 per 100,000, while the female age-standardised incidence rate remained at 0.8 per 100,000.

Number of deaths

At 31 May 2014, 218 (37.9%) mesothelioma patients diagnosed in 2013 were recorded as having died. Where cause of death was known, 89.4% were recorded as being due to mesothelioma.

Asbestos exposure

The AMR's data on asbestos exposure are based on the estimated exposure profiles of people with mesothelioma diagnosed since 1 July 2010.

Of the 387 people (308 males and 79 females) with mesothelioma who completed the asbestos exposure questionnaire, 350 (90.4% representing 279 males and 71 females) also completed the telephone interview.

Of the 350 who were interviewed:

- 213 (60.9%) respondents (208 males and 5 females) were found to have 'possible' or 'probable' occupational asbestos exposure
- 137 (39.1%) respondents provided no information to suggest they had occupational exposure. Of those, 114 people (54 males and 60 females) were found to have asbestos exposure in non-occupational contexts and 23 people provided no information to suggest they had asbestos exposure above background levels in either occupational or non-occupational spheres.

The assessments consider only the probability of asbestos exposure and the estimated level of exposure, but do not provide information about the duration, intensity or frequency of exposure, if exposure had occurred.

1. Introduction

Purpose

This is the third report of the Australian Mesothelioma Registry (AMR), a national registry that became operational in 2011. The AMR contains information about people diagnosed with mesothelioma in Australia from 1 July 2010 onwards. This report primarily presents data for the period from 1 January 2013 to 31 December 2013. Selected data for the 2011 and 2012 calendar years are also shown in Appendix B to help understand patterns of change in mesothelioma incidence and mortality.

Background

Asbestos is a well-established occupational carcinogen. The term 'asbestos' refers to a group of naturally occurring fibrous silicate minerals that are composed of fibres that do not readily break down within the human body and are resistant to fire and chemical corrosion. Asbestos fibres are so small that they are invisible to the naked eye and can be inhaled into the lungs.

Until the mid-1980s, Australia was a producer of asbestos and one of the world's highest users per capita of asbestos (Leigh et al. 2002). Asbestos-containing materials (ACMs) were used extensively in Australia due to their qualities of durability, and fire and chemical resistance. Examples of ACMs include insulation and flooring materials, wall and roof sheeting, brake linings, paints, rope, gas mask filters, oven insulation, fire proofing, pipes and lagging (Foster 1997).

Until the 1970s, ACMs were used extensively in construction (including residential homes), industrial plants and equipment, ship-building, train locomotives and motor vehicles. General use of asbestos in gaskets and brakes was only discontinued on 31 December 2003, when the use and importation of all forms of asbestos was prohibited in Australia. Some exemptions were granted for specialised use in the Australian armed forces. The legacy is a large amount of asbestos in buildings and other infrastructure, and thousands of different products containing asbestos are still in use today. Many homes built in Australia before the late 1980s contain some ACMs.

Asbestos exposure can cause cancers such as lung cancer (in interaction with tobacco smoking) and is the predominant cause of mesothelioma, an aggressive form of cancer that arises in the mesothelium – the membranous tissue that surrounds the heart, lungs, gastrointestinal and urogenital organs, and lines the chest and abdominal cavities. The mechanism by which asbestos causes cancer is only partly understood. Mesothelioma has been linked to both occupational and non-occupational exposure to asbestos; occupational exposure having been the most important source of exposure up to the present time.

Australia has one of the highest incidence rates of malignant mesothelioma in the world. The incidence of mesothelioma increased in Australia from at least 1982, when data on new cases first became available nationally (Safe Work Australia 2013), but a potential plateau in the number of new diagnoses between 2007 and 2010 is apparent (AIHW 2014). There is currently no cure for mesothelioma and the progression of the disease is usually rapid. Average life expectancy from diagnosis to death is nine months, and even with aggressive treatment, few people survive longer than two years.

The AMR

Since 2011, the AMR has collected new cases of mesothelioma diagnosed from 1 July 2010 in Australia. The Registry replaces the Australian Mesothelioma Register managed by the National Occupational Health and Safety Commission (NOHSC). In 1998, the voluntary notification of new cases to the Register by state and territory registries declined when new state and territory privacy

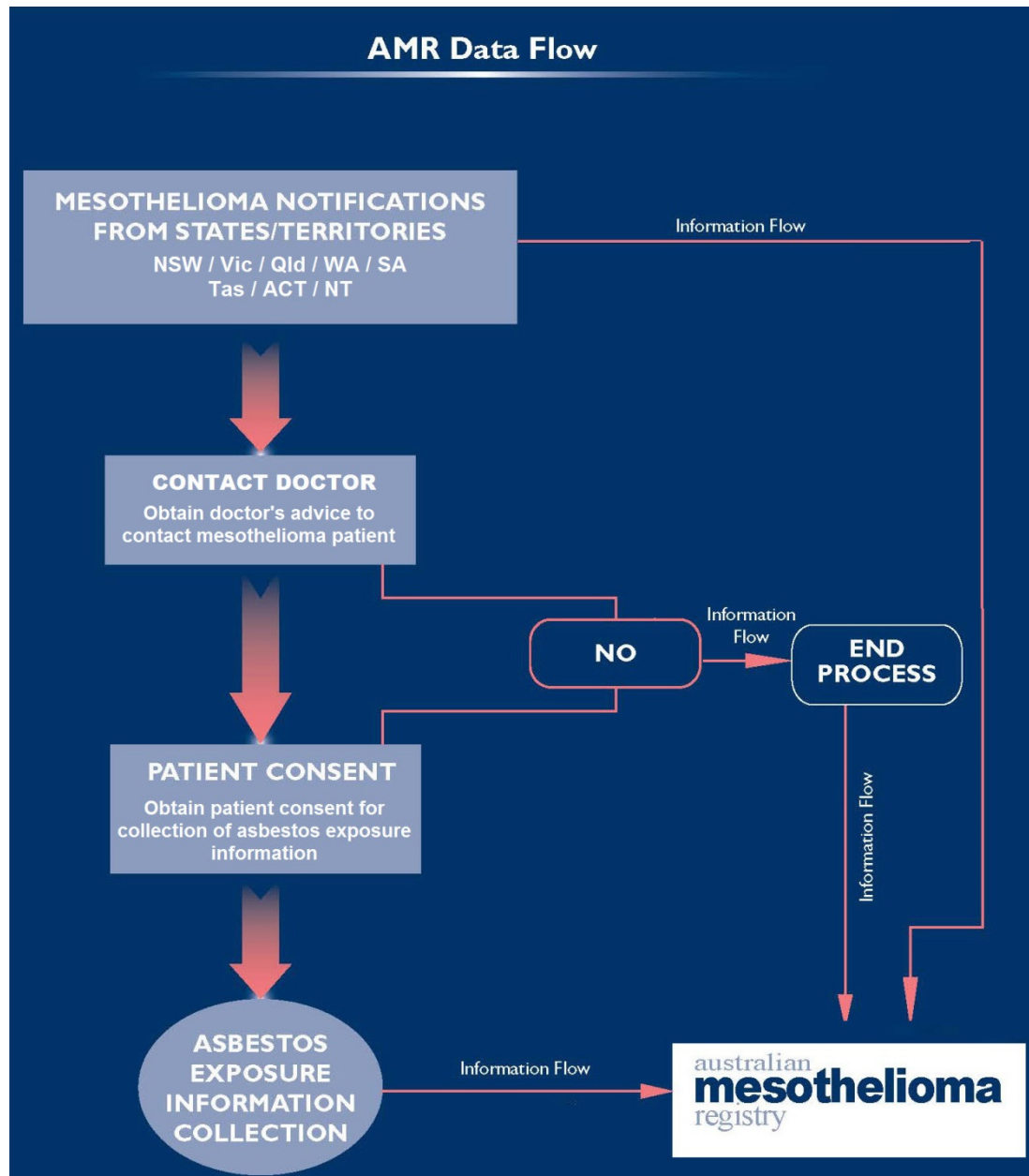
legislation was enacted. As a result, the incidence of mesothelioma was dramatically under-reported and the reporting of asbestos exposure information dropped to less than 50% of new cases reported. Due to incompleteness of data, published reports ceased in 2004 and the Register was suspended in December 2007.

The new AMR collects information about cases of mesothelioma to:

- accurately measure the incidence of mesothelioma in Australia for the purposes of
 - monitoring changes in the incidence of mesothelioma following the ban on all uses of asbestos
 - identifying increases in the incidence of mesothelioma that may result from ongoing or possibly increasing non-workplace exposure to asbestos already in the wider environment (the postulated third wave), or exposure to a new hazard entering the occupational or general environment
 - identifying the groups of workers most at risk of exposure to asbestos so that future exposures can be prevented.
- permit periodic assessment of mesothelioma survival to ascertain whether changes in care for mesothelioma are resulting in measurable improvements in survival
- document the asbestos or other exposure experience of people newly diagnosed with mesothelioma as a form of surveillance for new or increasing sources of exposure to asbestos or other carcinogenic fibres
- provide a resource for research into the causes and control of mesothelioma and to assist the development of policies to best deal with the asbestos still present in our environment.

The AMR collects asbestos exposure information via a postal questionnaire and telephone interview from eligible, consenting patients. The flow chart in Figure 1.1 shows the AMR's process of obtaining mesothelioma notifications and asbestos exposure data.

Figure 1.1: AMR data flow



Notifications

Notifications refer to the cases of mesothelioma provided to the AMR by the state and territory cancer registries. Cancer registries are notified of all cases of cancer diagnosed in residents living in their jurisdiction. For the AMR, mesothelioma cases are 'fast-tracked' by each state and territory; that is, these records are given priority and are processed and coded as quickly as possible. The state and territory cancer registries submit notifications to the AMR on a regular basis. Notified records include demographic information and details of the diagnosis and death.

Asbestos exposure information

Once a notification of mesothelioma is received, the state or territory cancer registry contacts the patient's clinician to confirm whether their patient meets the eligibility criteria for participation. Eligibility criteria include confirmation of mesothelioma diagnosis on or after 1 July 2010, and that the patient is well enough to be contacted about their exposure to asbestos. Following this, the state and territory cancer registries contact the patient.

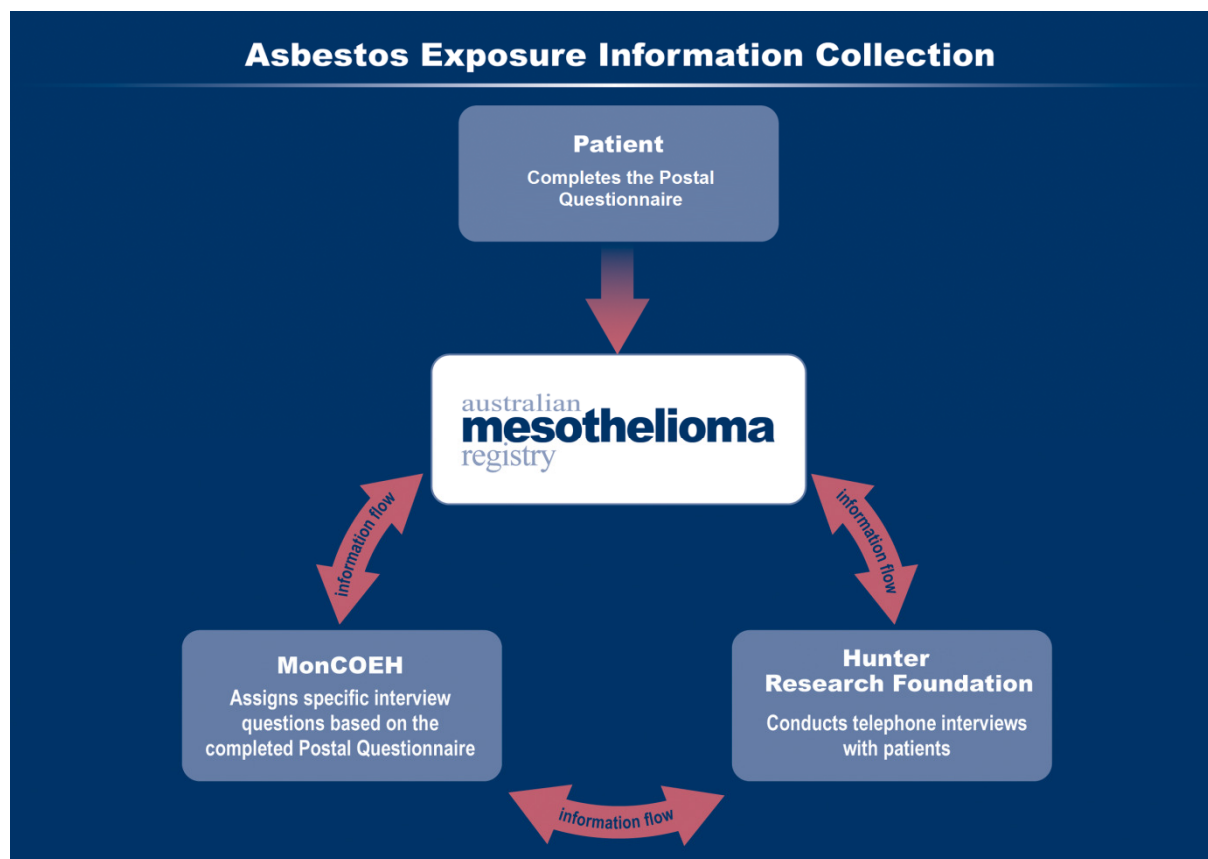
Patients are able to self-notify directly to the AMR. In this case, the AMR sends an information pack directly to the patient and the clinician is not contacted. Self-notifying patients are not included in the AMR unless a notification is received from the respective state or territory cancer registry to confirm their mesothelioma diagnosis.

Asbestos exposure information is obtained from consenting mesothelioma patients through a postal questionnaire and telephone interview (Figure 1.2). In the postal questionnaire, patients list their residence, school and occupation histories. Patients are also asked about their family history of mesothelioma. Patients' residence and occupation information is systematically compiled through an online assessment tool called OccIDEAS (Occupational Integrated Database Exposure Assessment System). The Monash Centre for Occupational and Environmental Health (MonCOEH) uses information from the postal questionnaire to assign relevant telephone interview questions for each person.

Following the postal questionnaire, a telephone interview is conducted. Based on the individual's responses to the postal questionnaire, specific questions are asked in the interview to assess their potential for having been exposed to asbestos. This means the telephone interview is tailored to the participant. The Hunter Research Foundation (HRF) conducts the telephone interviews.

The information collected is used by MonCOEH staff to assess and assign values to each patient's lifetime asbestos exposure. Further information about the asbestos exposure assessments can be found in Appendix A.

Figure 1.2: AMR asbestos exposure information collection



This report

This is the third report presenting data collected from the AMR, including mesothelioma notifications and asbestos exposure information. This report primarily presents data for patients diagnosed during the calendar year 1 January 2013–31 December 2013.

Since the AMR's 2011 data were first published (AMR 2012), an additional 51 people diagnosed with mesothelioma in 2011 have been notified to the AMR. Since the 2012 report was published (AMR 2013), 33 new cases have been notified for that year. Possible reasons for the extended time between diagnosis and notification include delays in:

- confirmation of diagnosis
- notification by pathology laboratories to cancer registries
- the cancer registry process (e.g. periodic shortage of experienced staff, time taken to code complex cases).

The reported incidence and mortality figures are based on the data recorded at the time of extraction from the AMR. Extraction dates and methods used may differ across AMR publications. Table A1 shows the differences in AMR reports published between 2012 and 2014.

The report includes the following additional sections:

2. Incidence
3. Mortality
4. Asbestos exposure.

Appendix A details methods used for collating and reporting the data. Appendix B contains additional data, including tables underlying the figures and data for 2011 and 2012.

2. Incidence

Number of cases

In total, 575 people diagnosed with mesothelioma from 1 January 2013 to 31 December 2013 had been notified to the AMR at 31 May 2014 (Table 2.1). This compares with 619 cases reported for 2012 at 30 June 2013.

Table 2.1: People in Australia newly diagnosed with mesothelioma by sex and six-month period, 2013

	1 January– 30 June 2013	1 July– 31 December 2013	Total
Males	245	220	465
Females	48	62	110
Persons	293	282	575

Since the previous publication (AMR 2013), there have been additional notifications of people diagnosed with mesothelioma reported to the AMR: 24 for 2011 (3.8% increase), and 33 for 2012 (5.3% increase). A similar increase is anticipated in the reported number of patients diagnosed in 2013.

Table 2.2 shows the number of males and females newly diagnosed with mesothelioma by state and territory for the year 2013. The incidence rate for males and females combined was 2.2 per 100,000 person-years overall and ranged from 1.8 in both New South Wales and Victoria, to 3.9 in Western Australia. The rate for males was higher than for females in all jurisdictions and overall (3.9 and 0.8, respectively).

The incidence rate age-standardised to the World Standard Population (Segi 1960) was 1.2 per 100,000 (Table A4). This is the figure that should be used when comparing incidence rates in Australia to those in other countries.

The overall 2013 age-standardised mesothelioma incidence rates differed minimally from those in 2011 and 2012 (Table A5).

Table 2.2: New cases of mesothelioma and age-standardised incidence rates by sex and state and territory, 2013

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number									
Males	129	91	100	80	49	n.p.	<5	4	465
Females	29	32	23	15	7	<5	<5	—	110
Persons	158	123	123	95	56	9	7	4	575
Rate per 100,000 person-years^(a)									
Males	3.2	3.0	4.5	8.3	4.3	n.p.	n.p.	n.p.	3.9
Females	0.6	0.9	0.9	1.4	n.p.	n.p.	n.p.	—	0.8
Persons	1.8	1.8	2.6	3.9	2.5	n.p.	n.p.	n.p.	2.2

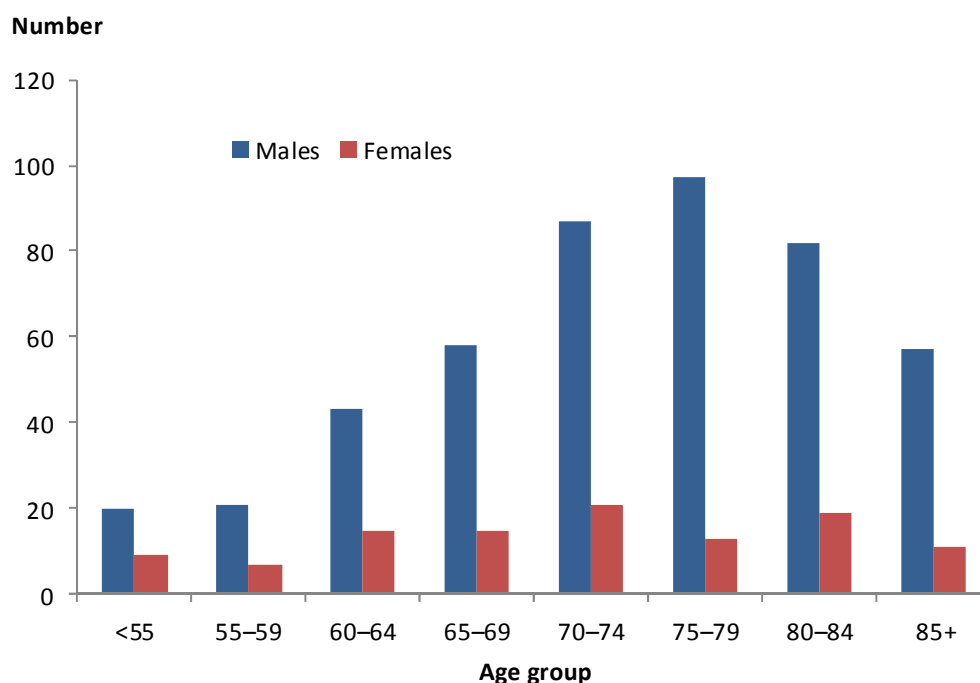
(a) Directly age-standardised using the 2001 Australian standard population.

n.p. Not published due to small numbers.

Age at diagnosis for patients diagnosed in 2013 ranged from 27 to 96 years. The largest proportions were in the age groups ranging from 70 years to 84 years (Table A6).

Figure 2.1 shows the distribution by age and sex of new cases of mesothelioma diagnosed in 2013. There were 465 males diagnosed with mesothelioma (see Table 2.1) with the largest numbers in the 75–79 year age group (97 patients) (Table A7). The 110 females diagnosed with mesothelioma were more evenly spread across age groups.

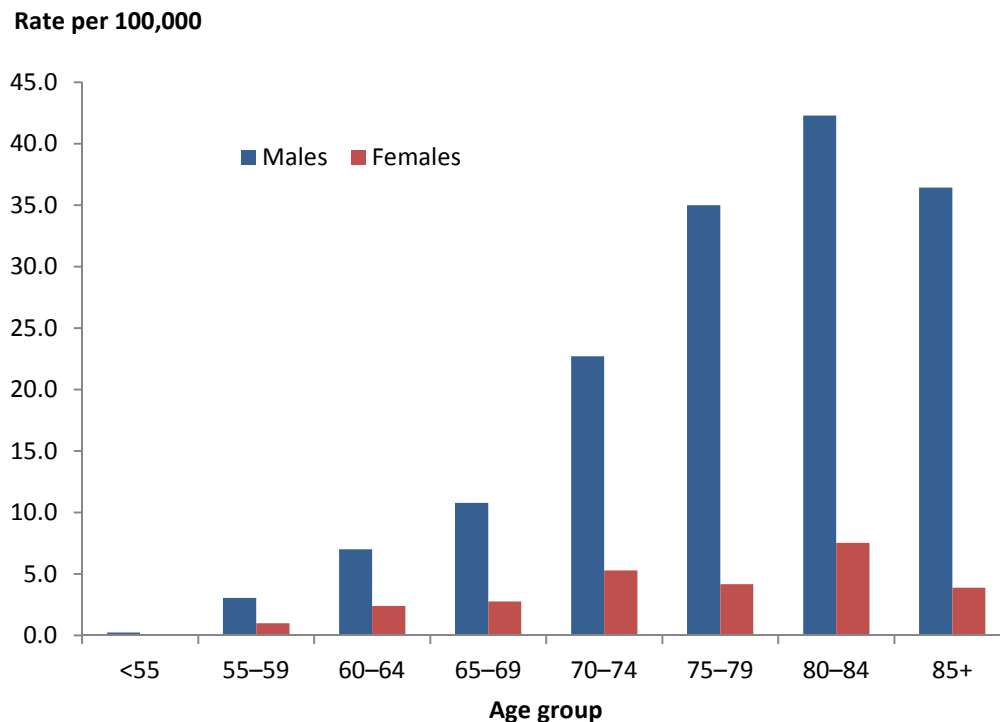
Figure 2.1: New cases of mesothelioma by age group and sex, 2013



Source: Table A7.

Age-specific incidence rates of mesothelioma (Figure 2.2) generally increased with age. The rates were highest at 42.3 per 100,000 among males aged 80–84 years, and 7.5 per 100,000 females aged 80–84 years (Table A7).

Figure 2.2: Age-specific incidence rates of mesothelioma by sex, 2013



Source: Table A7.

Diagnosis information

In 2013, epithelioid mesothelioma was the most common subtype (46.8%) of mesothelioma notified to the cancer registries. Sarcomatoid mesothelioma, which includes desmoplastic mesothelioma, accounted for 12.7%. Biphasic mesothelioma, where a combination of epithelioid and sarcomatoid cells are present, represented 12.2%, while unspecified types of malignant mesothelioma accounted for 28.3% of cases (Table 2.3). The tumour location was the pleura for 93.9% of patients (Table 2.4).

Table 2.3: New cases of mesothelioma by histological type, 2013

Type of mesothelioma	Number	Per cent
Epithelioid	269	46.8
Sarcomatoid ^(a)	73	12.7
Biphasic	70	12.2
Malignant – not otherwise specified	163	28.3
Total	575	100.0

(a) Includes desmoplastic mesothelioma.

Table 2.4: New cases of mesothelioma by location of tumour, 2013

Tumour location	Number	Per cent
Pleura ^(a)	540	93.9
Peritoneum ^(b)	34	5.9
Other	1	0.2
Total	575	100.0

(a) Includes pericardium, pleura and mediastinum.

(b) Includes peritoneum and specified parts of peritoneum.

Table 2.5 presents laterality information, excluding 13 cases for non-paired organs where this was not applicable. Only one of the reported tumours was bilateral.

Table 2.5: New cases of mesothelioma by laterality (where applicable), 2013

Laterality	Number	Per cent
Right	196	34.9
Left	178	31.7
Bilateral	1	0.2
Not stated	187	33.3
Total	562	100.0

The most common basis for diagnosis was histology (90.6%). There were no cases for this period where diagnosis was based on the death certificate only (Table 2.6). National death data for 2013 have not yet been received by all cancer registries; therefore, the total number of mesothelioma deaths reported here is likely to be an underestimate. It is expected that at least 3–4% of all incident mesothelioma cases will ultimately be ‘diagnosed’ by death certificate only.

Table 2.6: New cases of mesothelioma by best basis of diagnosis, 2013

Best basis	Number	Per cent
Death certificate only	—	—
Clinical, no investigation ^(a)	2	0.3
Clinical investigation ^(b)	11	1.9
Specific tumour markers	—	—
Cytology	41	7.1
Histology ^(c)	521	90.6
Total	575	100.0

(a) Diagnosis made before death, but without any of the remaining types of information listed.

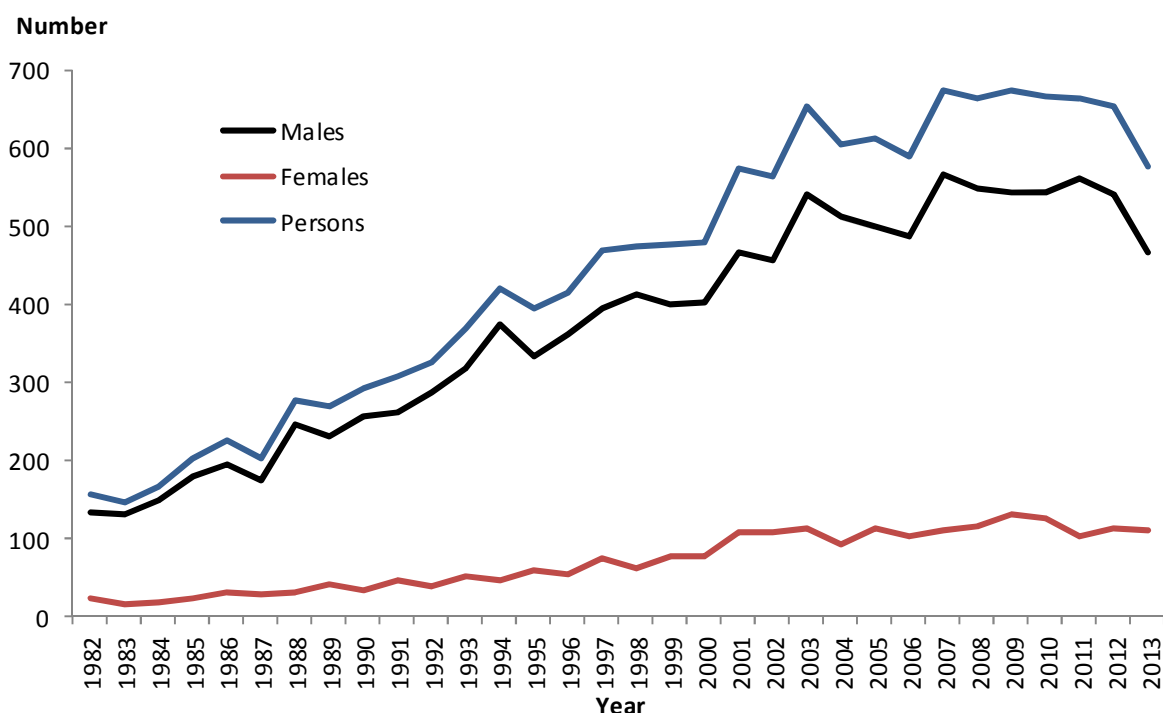
(b) All diagnostic techniques, including x-ray, endoscopy, imaging, ultrasound, exploratory surgery and autopsy, without a tissue diagnosis.

(c) Includes histology of metastasis, primary tumour or not otherwise specified.

Trends over time

There are limitations with reporting mesothelioma trends due to the lack of time series data in the AMR at this stage. However, Figures 2.3 and 2.4 present trends in mesothelioma incidence using available data from two sources: the Australian Cancer Database (ACD) (AIHW 2014) for 1982–2010, and the AMR for 2011–2013. To date, the highest overall number of new cases has been reported for 2007 (674) and 2009 (673). It is important to note that the apparent decline seen in recent years may be due to delays in notifications of mesothelioma cases to the AMR, rather than a real decline in incidence.

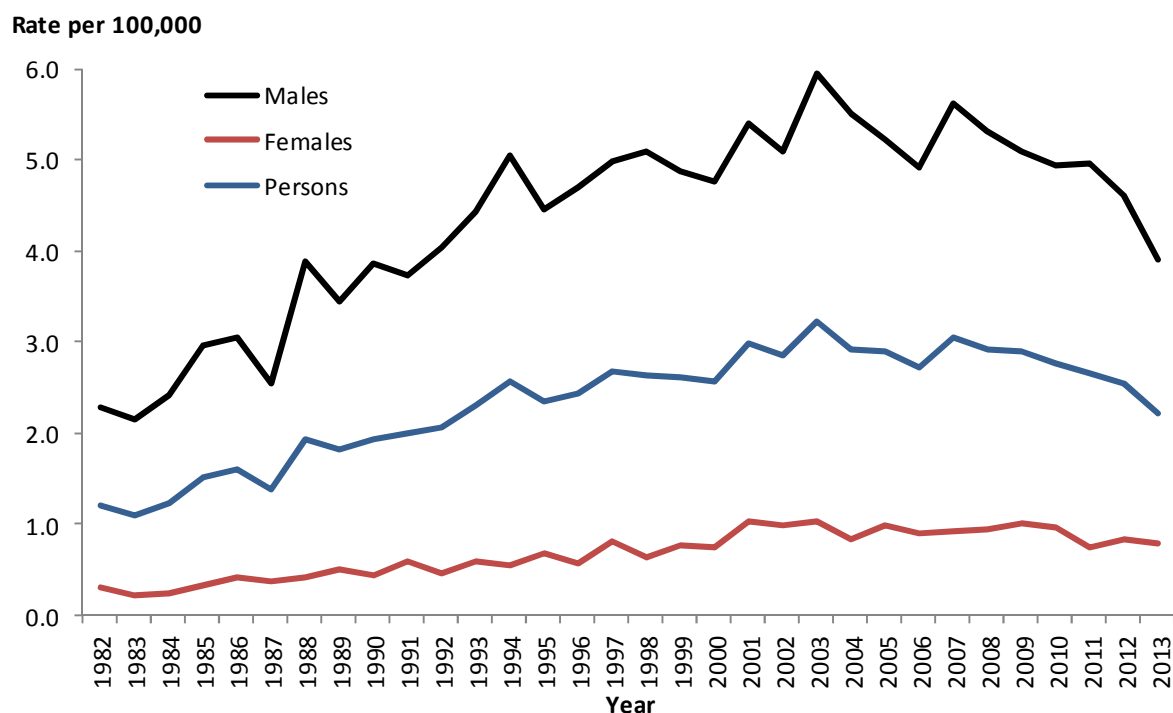
Figure 2.3: New cases of mesothelioma by year of diagnosis and sex, 1982 to 2013



Source: Table A8.

Using the same sources, age-standardised incidence rates show some fluctuation, although a general increase occurred to 2003, when the overall rate was 3.2 per 100,000. This rate has remained between 2.7 and 3.0 per 100,000 from 2004 to 2013 (Figure 2.4).

Figure 2.4: Age-standardised incidence rates of mesothelioma by year of diagnosis and sex, 1982 to 2013



Source: Table A8.

3. Mortality

Mortality figures are obtained using data linkage of AMR cases to the National Death Index (NDI). Where NDI data are not available, date and cause of death information from state and territory cancer registry data are reported (see Appendix A).

Number of deaths

Of the 575 people diagnosed with mesothelioma in 2013 and notified to the AMR, there were 218 (37.9%) deaths nationally (Table 3.1).

Table 3.1: Deaths of people diagnosed with mesothelioma in 2013 by state and territory

Deaths	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number	61	45	45	31	28	<5	<5	<5	218
Per cent of patients diagnosed	38.6	36.6	36.6	32.6	50.0	n.p.	n.p.	n.p.	37.9

Note: Includes death information from the NDI where available, otherwise from state/territory cancer registries.

n.p. Not published due to small numbers.

Since the publication of the last AMR report (AMR 2013), there has been a 30.9% increase in the number of deaths of people diagnosed with mesothelioma in 2011 from 437 to 572. Likewise, there was a 62.8% increase in deaths from 290 to 472 for people diagnosed in 2012 (Table A9). The 2013 death figures are expected to increase in a similar way in subsequent editions of this report as death information becomes available for all relevant cases.

Cause of death

No cause of death information was available from the NDI for 2013 cases. Cause of death information from state and territory cancer registries was available for 47 of the 218 (21.6 %) deaths recorded in this period. Where cause of death was known, mesothelioma was the cause of death in 89.4% of cases (in five cases, mesothelioma was not listed as the cause of death).

Table 3.2: Cause of death known for people diagnosed with mesothelioma in 2013

Cause of death	Number	Per cent
Mesothelioma	42	89.4
Not mesothelioma	5	10.6
Total	47	100.0

Note: Death information from state/territory cancer registries.

Cause of death from either the NDI or state and territory cancer registries was available for 287 of the 572 (50.2%) deaths recorded for people diagnosed with mesothelioma in 2011, and for 125 of the 472 (26.5%) deaths recorded for people diagnosed in 2012 (Tables A8 and A9). Cause of death information is not yet available for the majority of deaths of people diagnosed in 2012 and 2013, as cases are yet to be coded.

There are as yet insufficient data from the AMR to report trends in mortality and survival or to provide future projections of incidence and mortality.

4. Asbestos exposure

This section describes the results of exposure assessment for participants diagnosed from 1 July 2010 onwards. Table 4.1 presents the numbers of people who completed the recruitment process or were in the process of being recruited at 30 April 2014. This table should be interpreted in the context of Table A3 (Appendix A), which outlines the patient recruitment models used by the state and territory cancer registries.

The overall number of people diagnosed since 1 July 2010 who consented to participate in the asbestos exposure assessment was 387 at 30 April 2014. Of these, 350 people (90.4%) completed both the questionnaire and telephone interview components of the assessment (Table 4.1).

Table 4.1: Recruitment for asbestos exposure data collection by year of diagnosis and state and territory, at 30 April 2014

Year of diagnosis	NSW/ACT ^(a)	Vic	Qld	WA	SA	Tas	NT	Total
Consenting patients/Postal questionnaires completed								
2010–2011	37	41	16	12	13	6	1	126
2012	55	32	20	28	5	5	—	145
2013	33	26	13	20	11	2	1	106
2014	2	—	—	3	5	—	—	10
Total	127	99	49	63	34	13	2	387
Interviews conducted								
2010–2011	32	36	15	12	10	5	1	111
2012	53	28	18	26	5	5	—	135
2013	28	25	12	20	9	2	1	97
2014	2	—	—	1	4	—	—	7
Total	115	89	45	59	28	12	2	350

(a) Includes six ACT participants.

Of the 387 participants who completed the postal questionnaire, 22 (5.7%) reported a family member who also had mesothelioma. However, 50 (12.9%) respondents did not answer this question.

The remainder of this section includes information on the individuals who had consented to participate at 30 April 2014 and who completed both a questionnaire and a telephone interview.

Asbestos exposure assessment: overview

The asbestos exposure assessment for each participant was, in the first instance, based on an assessment of each job held by the participant using job-specific modules (JSMs) (see Appendix A for detailed methodology). The occupational and non-occupational asbestos exposures of participants were assessed and classified according to the likelihood the person was exposed to asbestos above background levels. A sequential analysis was conducted whereby non-occupational exposures were only assessed for those participants for whom occupational exposure was found to be unlikely.

It is important to note that the assessment scheme used in this report is based on probability of exposure to asbestos and does not take into account intensity, duration or frequency of exposure. The classification used is a three-level scheme: asbestos exposure ‘probable’, ‘possible’ or ‘unlikely’ (Table 4.2). For jobs assessed as ‘probable’, exposure was further classified by level of exposure (eight-hour time-weighted average (TWA)) (Table 4.2).

For the purpose of this report, where a participant received the same JSM multiple times (i.e. for different jobs in the same field), with different jobs assessed as having different probabilities of exposure, then the highest probability of exposure derived from that JSM for that individual has been reported.

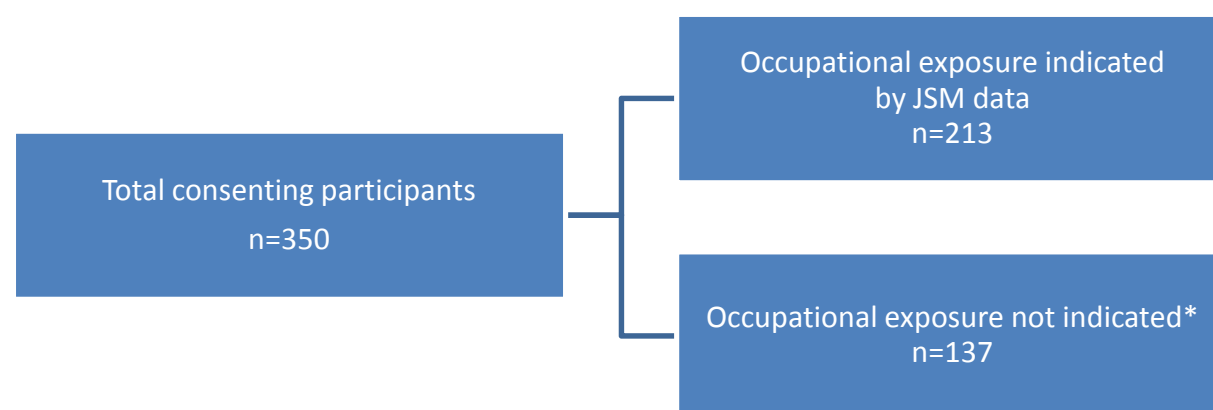
Table 4.2: Classification of assessments of exposure probability and estimated level of exposure – not taking into account frequency/duration of exposure

Level	Description						
Unlikely	No information from JSM interview to indicate exposure, or jobs not allocated JSMs because there was considered to be a low likelihood of exposure.						
Possible	Information, usually from JSM interview, indicated that exposure may have occurred.						
Probable	Convincing information from JSM interview data that exposure was more likely than not. Probable exposures are further classified by estimated maximum level of exposure, as follows: <table> <tr> <td>Probable high</td><td>Maximum exposure greater than 2 fibres/ml (8-hour TWA)</td></tr> <tr> <td>Probable medium</td><td>Maximum exposure 0.1–2.0 fibres/ml (8-hour TWA)</td></tr> <tr> <td>Probable low</td><td>Maximum exposure less than 0.1 fibres/ml (8-hour TWA)</td></tr> </table>	Probable high	Maximum exposure greater than 2 fibres/ml (8-hour TWA)	Probable medium	Maximum exposure 0.1–2.0 fibres/ml (8-hour TWA)	Probable low	Maximum exposure less than 0.1 fibres/ml (8-hour TWA)
Probable high	Maximum exposure greater than 2 fibres/ml (8-hour TWA)						
Probable medium	Maximum exposure 0.1–2.0 fibres/ml (8-hour TWA)						
Probable low	Maximum exposure less than 0.1 fibres/ml (8-hour TWA)						

Note: The same categories of exposure probability have also been used in the assessment of non-occupational exposure.

Figure 4.1 gives an overview of the occupational exposure assessment of the 350 participants who had participated fully in the exposure component at 30 April 2014. Of these, 247 participants completed telephone interviews to collect specific data about occupational asbestos exposure. The remaining 103 participants did not receive any JSMs. (However, these participants did receive the non-occupational module: see below.) These individuals had either never had paid jobs (two participants) or their job history did not include jobs indicative of possible asbestos exposure. Females comprised 60.2% of this group.

Figure 4.1: Occupational exposure assessment summary



Note: JSM = job-specific module

* 'Occupational exposure not indicated' group further evaluated for non-occupational exposure below (see Figure 4.2).

In summary, a total of 213 (60.9%) participants were assessed as having possible or probable occupational asbestos exposure (including five females). Of the 137 assessed as having no indication of occupational exposure, data from the non-occupational exposure module indicated that 114 (54 males and 60 females) had possible or probable non-occupational exposure. No information was found to indicate asbestos exposure in either occupational or non-occupational spheres for 23 participants (6.6%) (Figure 4.2).

Further details about occupational and non-occupational exposure findings are provided below. It is important to note that the data presented represent the exposure profiles of mesothelioma cases only. Because comparable exposure data from the general population are not available at this time, estimates of the risk of mesothelioma associated with particular exposure circumstances ascertained cannot be made.

Occupational asbestos exposure assessed by job-specific modules (JSMs)

JSMs were allocated to particular jobs that the participant held during their working career for which more information was needed by the exposure assessment team. Jobs with very low probability of exposure were not allocated JSMs, and where a participant had many similar jobs, JSMs were allocated to a representative selection.

Table 4.3 shows how many participants received each of the most commonly used JSMs at least once. A single participant could receive a particular JSM more than once for different jobs, and a single participant could receive JSMs of different types for different jobs. Each single job could only receive one JSM; therefore, the totals in Table 4.3 do not add up to the total number of participants.

The most frequently administered JSM was the Trades module, which was intended to capture asbestos exposures in a wide range of trades and related jobs. Seventy-eight participants were given this module to evaluate construction-related jobs, 28 participants received the Trades JSM for electrician-related jobs, 16 for plumbing-related jobs, 14 for boilermaker and/or welder-related jobs and 55 for other metal/mechanical-related jobs. JSMs for land and water transport-related jobs were given to 56 and 43 participants respectively. The Land Transport module was most frequently used for jobs involving driving or operating other mobile plant and jobs associated with maintenance of land vehicles (including heavy and light road vehicles as well as railway trains or other mobile plant). The Water Transport JSM was most frequently given for shipbuilding and/or maintenance jobs. The 'Asbestos Users N.E.C.' module was intended to capture asbestos exposure in a range of miscellaneous jobs and it was administered to 16 participants. The largest single group given this module were given it for laundry-related jobs. Nineteen participants were given other JSMs.

The Asbestos Mine/Mill JSM was administered to only two participants who reported jobs in the asbestos mining/milling industry (and exposure was assessed as probable and high for these jobs in both cases). No participants reported jobs as dedicated asbestos removalists.

Table 4.3: Job-specific modules (JSMs) assigned to participants by types of jobs

JSM name	Types of jobs covered by this JSM	No. participants allocated this JSM at least once^(a)
Trades	Construction (carpenter, joiner, builder, bricklayer etc.)	78
	Electrician	28
	Plumber	16
	Boilermaker, welder	14
	Other metal & mechanical trades (including fitters, turners, machinists)	55
	Engineer	8
	Telecommunications technician	9
	Other	42
	Total participants given Trades JSM	203
Land Transport	Driver	20
	Mechanic/fitter/panel beater	31
	Other	9
	Total participants given Land Transport JSM	56
Water Transport	Marine engineer/mechanic	11
	Other seagoing jobs (including military navy)	5
	Shipwright/boat builder	20
	Waterside worker/stevedore	6
	Other	4
	Total participants given Water Transport JSM	43
Asbestos Users N.E.C.	Laundry worker	6
	Other	11
	Total participants given Asbestos Users N.E.C. JSM	16
Other JSMs^(b)	Total participants given other JSMs	19

(a) Individuals can be allocated more than one JSM and therefore the totals in this table do not equal the total number of participants. An individual can receive the same JSM several times for different jobs, or can receive different JSMs for different jobs, as appropriate to the individual's job history.

(b) Other JSMs: furnace industry, insulator, asbestos mine/mill, asbestos removalist, automotive component manufacture, cement factory, tip worker and textile manufacture.

Table 4.4 shows how many participants received each of the most commonly reported JSMs and the highest probability/level of exposure estimated for these participants based on the module in question. Given that participants can receive more than one type of JSM, the numbers in this table do not equal the number of participants.

Of those participants who received the Trades JSM, 162 (79.8%) were classified as probably exposed on the basis of the information they provided in response to that module. The majority of these were classified as having high probable exposure. It is important to note that this exposure assessment method ('highest ever') tends to classify individuals as 'high' exposure level so the many 'high' exposure levels in this and subsequent tables should be interpreted with caution. It is also important to note that these findings are for mesothelioma cases, among whom higher levels of exposure are not unexpected. For 25 (12.3%) of the recipients of the Trades JSM, asbestos exposure was considered unlikely based on this JSM. For the majority (71.4%) of those who received the Land

Transport JSM, exposure was considered unlikely based on that JSM and for the majority (72.1%) of those who received the Water Transport JSM, evidence suggested exposure was probable.

Table 4.4: Job-specific module (JSM) exposure assessment results (probability and estimated level of exposure only) by JSM type (for JSMs used sufficiently often for meaningful interpretation)

JSM name	No. participants allocated JSM at least once	Assessed probability of exposure (no. participants)					
		Unlikely	Possible	Probable ^(b)			
				Unknown	Low	Medium	High
Trades	203	25	15	—	2	6	154
Land Transport	56	40	1	—	—	—	15
Water Transport	43	5	7	—	6	—	25
Asbestos Users N.E.C.	16	6	3	1	—	—	6
All other JSMs ^(a)	19	4	3	1	3	2	6

(a) Other JSMs: furnace industry, insulator, asbestos mine/mill, asbestos removalist, automotive component manufacture, cement factory, tip worker and textile manufacture.

(b) These categories refer to the estimated level of asbestos exposure.

Table 4.5 shows the assessed exposure probability and level for the 203 participants who received the Trades JSM, by the most common job types reported by these participants. The majority of individuals given the Trades JSM for construction, electrical, plumbing, metal trades or other trade-related jobs were classified as having had probable asbestos exposure.

Table 4.5: Trades JSM exposure assessment results (probability and estimated level of exposure only) for largest categories of job titles

Job title	No. participants allocated this JSM at least once	Assessed probability of exposure (no. participants for whom asbestos exposure was assessed)				
		Unlikely	Possible	Probable ^(a)		
				Low	Medium	High
Construction (carpenter, joiner, builder, bricklayer etc)	78	8	3	—	—	67
Electrician	28	6	4	—	—	18
Plumber	16	2	1	1	1	11
Boilermaker, welder	14	—	—	—	—	14
Other metal & mechanical trades (including fitters, turners, machinists)	55	9	6	1	2	37
Engineer	8	3	1	—	—	4
Telecommunications technician	9	5	2	—	—	2
Other	42	15	4	—	3	20
Total participants given Trades JSM	203					

(a) These categories refer to the estimated level of asbestos exposure.

Non-occupational exposure

All participants received a common questionnaire module to assess their non-occupational exposure regardless of occupational history and irrespective of whether JSMs were also administered to that individual. Information from the non-occupational module was used to assess exposure probability for each participant in the same way as occupational exposure probability was assessed ('probable', 'possible' or 'unlikely'), but only for participants where no occupational exposure was considered possible or probable.

For 137 participants, no evidence of occupational asbestos exposure was detected using the AMR exposure assessment methodology. Of those without evidence of occupational exposure, 114 were assessed as having had possible or probable exposure in non-occupational contexts based on data collected from the non-occupational questionnaire module, and for 23 participants the non-occupational exposure assessment did not identify possible or probable asbestos exposure above background levels (Figure 4.2).

Figure 4.2: Non-occupational exposure assessment summary

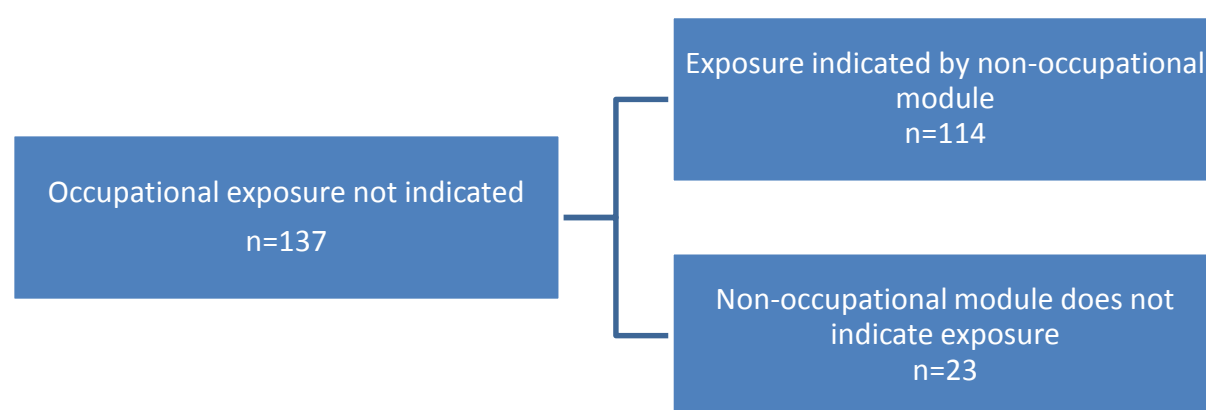


Table 4.6 shows the contexts of non-occupational asbestos exposure that were reported by 137 participants who completed the non-occupational module.

Table 4.6: Sources of non-occupational asbestos exposure among participants without occupational exposure

Non-occupational module section	Total	Probability of exposure		
		Unlikely	Possible	Probable
Ever lived in a house made mainly of fibro (built 1947–1987)	137	73	64	—
Ever lived near asbestos mine or asbestos products factory	137	130	5	2
Ever did major home renovations which involved asbestos products (excluding paid work)	137	86	51	—
Ever lived in a house during major renovations (where house was built and the work undertaken during relevant periods)	137	68	69	—
Ever serviced car brakes/clutch (excluding paid work)	137	115	22	—
Ever lived in same home as someone with asbestos-exposed job who came home dusty	137	114	14	9
Ever visited Wittenoom in Western Australia (excluding paid work)	137	125	12	—
Ever visited another Australian asbestos mining town (excluding paid work)	137	137	—	—
Other credible evidence of non-occupational exposure	137	125	12	—

Sixty-four respondents reported ever living in a house made mainly of fibro and which was built between 1947 and 1987. Seven participants reported living near an asbestos mine or factory. Of these, five reported having lived near a factory in which they believed asbestos was used. A further two participants who answered this question said they lived near the Australian Blue Asbestos Mine at Wittenoom, although answers to the subsequent question about visiting Wittenoom indicated that a total of four of the 137 had actually ever lived in Wittenoom.

It should be noted that a number of respondents answered the question about living in a house during renovations and undertaking major home renovations apparently in relation to the same renovation event: of the 51 home renovators, 33 also answered ‘yes’ to living in a house during renovations. Of the 51 who reported having done home renovations, 19 were women.

Of the 12 participants in Table 4.6 who answered ‘yes’ to having visited Wittenoom, four had lived at Wittenoom for a period, but were not employed there. Of the remaining eight who had been visitors to Wittenoom, most visited only once and stays were generally for one day only. All of the eight Wittenoom visitors reported first visiting after the closure of the Wittenoom asbestos mine in 1966, and of those who answered the question about the reason for visiting Wittenoom, all reported that they had visited for recreation and/or visited family/friends.

In answer to the question about having lived with someone who regularly came home from work dusty, nine respondents were classified as having had probable exposure because they laundered the work clothes of a family member who had occupational asbestos exposure. A further 14 respondents were classified as possibly exposed in this way; most of these respondents either did not launder the worker’s clothing and/or the worker’s job details provided indicated that their asbestos exposure was less than probable.

It is important to note there is overlap between categories of exposure in Table 4.6. Among the 137 participants reported in the table, it was common to have indications of exposure in more than one

non-occupational context. Therefore, a number of participants are counted in more than one category and the column totals do not add up to 137.

In future AMR reports, non-occupational exposure will be able to be presented for all participants. Information will be available on those with potential exposures in both occupational and non-occupational contexts.

Exposure not indicated

For a total of 23 (6.6%) participants, no information was found to indicate asbestos exposure above background levels in either occupational or non-occupational spheres. Of these, 17 were males and six were females. These participants are classified as 'exposure unlikely'. It should be noted that although it has not been possible to identify asbestos exposure among these participants using the AMR exposure assessment, this does not mean that they have never been exposed to asbestos. It means that no evidence of above background exposure was obtained by the ascertainment methods used.

Appendix A: Methods

This report focuses on data for people diagnosed with mesothelioma during the period 1 January 2013–31 December 2013 and notified to the AMR. The data presented in the report represent those that had been received by the Australian Mesothelioma Registry at 30 April 2014 for exposure data and 31 May 2014 for incidence data. Mortality data from the NDI are reported at 10 March 2014 and from state and territory cancer registries at 31 May 2014 (Table A1).

Table A1: Differences in AMR reports over time

AMR report	Year of publication	Date of recorded incidence	Population used for age-specific rates	Population used for age standardisation	Date of recorded mortality	Death data type and source
Mesothelioma in Australia 2011	2012	31 August 2012	Australian estimated resident population at 30 June 2011	Australian estimated resident population at 30 June 2011	12 April 2012	Number of deaths & cause of death – National Death Index
					31 August 2012	Number of deaths & cause of death – state/territory cancer registries
Mesothelioma in Australia 2012	2013	30 June 2013	Australian estimated resident population at 30 June 2012	Australian 2001 standard population	10 April 2013	Number of deaths – National Death Index
				World Standard Population (Segi 1960)	30 June 2013	Cause of death – state/territory cancer registries
Mesothelioma in Australia 2013	2014	31 May 2014	Australian estimated resident population at 30 June 2013	Australian 2001 standard population	10 March 2014	Number of deaths & cause of death – National Death Index
				World Standard Population (Segi 1960)	31 May 2014	Number of deaths & cause of death – state/territory cancer registries

Statistical methods

Age groups: The basis for most statistics is a summation of cases by five-year age groups. Age groups are expressed as whole years.

Age-specific rates are calculated by dividing the number of cases by the Australian estimated resident population of the same sex and age group at 30 June 2013.

Age-standardised rates are calculated by the direct method and represent a summation of weighted age-specific rates. The **2001 Australian standard population** or the **World Standard Population** (Segi 1960) is used for age-standardised rate calculations in tables, as indicated.

Rates in this report are calculated separately for males and females and are expressed as diagnoses per 100,000 person-years, with most data reported as the rate per 100,000.

Completeness

Notification data were complete for the majority of data items for 2013 diagnoses. However, the percentage of missing mandatory fields ranged from 0.0% to 40.5%.

For 2013 diagnoses, there were 218 cases with a date of death recorded. Of these, the cause of death was unknown for 78.4% of the cases.

For South Australia (SA), the following data items were not provided unless the patient consented to participate: Indigenous status, country of birth, full date of birth (month and year are provided), full date of diagnosis (month and year are provided), address and all names. In Table A2, 44 of the missing cases for these fields are from SA. In addition, cause of death is provided by SA for all cases if it is sourced from linkage with the NDI; otherwise it is provided for consenting patients only, from other sources.

Table A2: AMR notification fields and per cent of missing records, 2013

Field	Mandatory field	No. of records	No. missing/ not stated	Per cent missing
Cancer registry ID/unique identifier	Yes	575	—	—
Record status	Yes	575	—	—
State/territory	Yes	575	—	—
Title	No	575	461	80.2
Last name	Yes	575	44	7.7
First name	Yes	575	44	7.7
Other names	No	575	231	40.2
Case address	Yes	575	44	7.7
Date of birth ^(a)	Yes	575	44	7.7
Sex	Yes	575	—	—
Indigenous status	Yes	575	233	40.5
Country of birth	No	575	216	37.6
Diagnosis date ^(b)	Yes	575	—	—
Best basis of diagnosis	Yes	575	—	—
Topography	Yes	575	—	—
Morphology	Yes	575	—	—
Laterality	No	562	187	33.3
Date of death	No	218	—	—
Cause of death	No	218	171	78.4

(a) The 44 missing cases are for SA where only MM/YYYY has been provided, although full dates are recorded by SA.

(b) Diagnosis date is only available as MM/YYYY for NSW/ACT. SA also only provides MM/YYYY, although full dates are recorded by SA. These have not been included in missing figures as month and year of diagnosis is adequate.

New South Wales (NSW) reported receiving mesothelioma notifications without pathological confirmation. At 31 May 2014, there were 127 reported cases of mesothelioma yet to be confirmed for NSW, across several diagnosis years. For these cases, there is some evidence to suggest mesothelioma, but not enough to satisfy the criteria of the state's internal coding policy. This may also be the case for other state and territory cancer registries. These additional diagnoses have not been included in figures for this report.

Cases may be notified to the AMR and then removed due to identification as a duplicate, or a change in diagnosis, date of diagnosis or other details. The records that have been removed are retained in the AMR system and recorded as inactive records. Inactive records are not included in this report.

Data linkage with the National Death Index

All records in the AMR at 10 March 2014 were sent to the Australian Institute of Health and Welfare (AIHW) for linkage with the NDI. The purpose of the linkage was to obtain death data, including date of death and cause of death, for all relevant records on the AMR.

Cases notified to the AMR after 10 March 2014 were not included in the data linkage; therefore, death figures may be an underestimate. However, data from state and territory cancer registries were used where NDI data were unavailable. Due to the 2013 AMR data being relatively recent, cause of death information from the NDI was not yet available for any 2013 records. Subsequently, provisional data from states and territories were used for cause of death information for 2013, and for earlier years where NDI data were unavailable. Death data obtained from the NDI will be updated to allow reporting of death information for previous years in subsequent AMR reports.

The AMR data are linked with the NDI on an annual basis and the linkage provides updates to all previously linked cases and those not successfully linked. The NDI data on deaths are based on collected data from state and territory Registrars of Births, Deaths and Marriages and coded cause of death from the Australian Bureau of Statistics (ABS). These data may differ to those reported by state and territory cancer registries, which may use a combination of sources including but not limited to pathology reports, other notifications and death certificates, to ascertain deaths for mesothelioma cases.

Small cells

Small cells of less than five cases have been presented in some tables in this report. Exceptions are state and territory tables disaggregated by more than one demographic factor, such as sex and age group, and where rates are based on cells of less than 10 cases. The data in the asbestos exposure section are based on exposure judgements made by MonCOEH and not solely on demographic characteristics, so they do not directly represent information provided by interview participants. Therefore, cells of less than five cases have been presented in this section.

Patient recruitment for asbestos exposure component

Patient recruitment for the AMR includes two main phases: contacting the patient's doctor to obtain advice on eligibility of the patient to participate in the postal questionnaire and telephone interview, and, if consent is received, contacting the patient to see if they are interested in participating.

The patient recruitment processes vary across the states and territories in line with a state's or territory's ethics approval or patient recruitment protocols. In Queensland, South Australia and Northern Territory, doctors need to return a completed consent form to the relevant cancer registry to indicate consent. All other jurisdictions (NSW/Australian Capital Territory, Victoria, Western Australia and Tasmania) are operating on a 'passive consent' (opt out) model. A passive consent model is one where consent is assumed and the patient is contacted if doctors do not respond within three to four weeks. Table A3 presents some characteristics of the different processes.

Table A3: Characteristics of patient recruitment process, by state and territory

	NSW/ACT	Vic	Qld	WA	SA	Tas	NT
Doctor stage							
'Opt out' for clinicians	Yes	Yes	No	Yes	No	Yes	No
Timeframe for 'opt out'	4 wks	4 wks	—	3–4 wks	—	3 wks	—
Patient stage							
Return of consents/questionnaire directly to AMR	Yes	No	No	Yes	No	Yes	Yes

Coding of occupations

All occupations reported by patients via the AMR postal questionnaire are coded according to the Australian and New Zealand Standard Classification of Occupations (ANZSCO) (ABS 2013). These data are not presented in this report. However, all data have been coded down to the Unit Group level (six-digit classification) where possible.

Assessment of asbestos exposure

Occupation and residence histories provided via the postal questionnaire are entered into OccIDEAS, and MonCOEH staff review the job history to assign JSMs for the telephone interviewers to administer. JSMs are allocated to particular jobs that the participant has reported, based on judgement by MonCOEH of possible asbestos exposure. The purpose of a JSM is to ask a systematic series of questions about a possible asbestos-exposed job, in a standardised way, to elicit task and exposure information that can then be used to estimate the individual's occupational asbestos exposure. Participants may receive several JSMs for different jobs, or none depending on how many jobs they had for which the exposure assessor judges as requiring further investigation. Where the participant has a large number of jobs of interest, it is not feasible to administer JSMs for all jobs. A judgement is made taking into consideration the number of relevant jobs and the module lengths, with the aim to keep the telephone interview to 30 minutes or less. Exposure in some jobs may be assessed by extrapolation of exposure probability in similar jobs held by the same participant. JSMs are not allocated to jobs with very low probability of exposure (MacFarlane et al. 2012).

Since non-occupational asbestos exposure is relevant for a proportion of participants, a non-occupational module has been constructed in OccIDEAS. This module is similar to a conventional OccIDEAS JSM except that it asks about non-occupational exposures across the patient's lifespan, such as home renovations and whether the patient had ever visited an asbestos mining town. All interview participants receive the non-occupational module, irrespective of their occupational history and whether or not that participant also received any JSMs. However, the non-occupational data have only been analysed where occupational exposures are considered unlikely.

For the purposes of this report, exposure to asbestos has been assessed as the probability of any exposure and the estimated level of exposure. The classification of exposure probability uses a three-level scheme: 'probable', 'possible' and 'unlikely'. Jobs, where there is information to indicate that exposure above background levels was likely, were assessed as 'probably exposed'. 'Possibly exposed' indicates that the available information suggests that exposure may have occurred but was judged not to be probable. Jobs where no information was found to indicate asbestos exposure above background levels were classified as 'exposure unlikely'. The non-occupational module was assessed and classified in the same way.

The estimated level of occupational exposure is classified as 'probable high', 'probable medium' and 'probable low'. For jobs assessed as 'probable', exposure was further classified by level of exposure (eight-hour time-weighted average) (Table 4.2). The classification of likely level of exposure in participants' jobs was informed by published exposure data supplemented by expert judgement (Fritschi et al. 2003). Estimated levels of non-occupational exposure have not been calculated at this time.

Appendix B: Additional tables

Table A4: Age-standardised incidence rates (World Standard Population) by sex and state and territory, 2013

Sex	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Rate per 100,000 person-years ^(a)									
Males	1.7	1.6	2.3	4.5	2.3	n.p.	n.p.	n.p.	2.1
Females	0.4	0.5	0.6	1.0	n.p.	n.p.	n.p.	—	0.5
Persons	1.0	1.0	1.4	2.2	1.4	n.p.	n.p.	n.p.	1.2

(a) Directly age-standardised using the World Standard Population (Segi 1960).

n.p. Not published due to small numbers.

Table A5: New cases of mesothelioma and age-standardised incidence rates by sex and state and territory, 2011 and 2012

Year/Sex	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
2011									
Number									
Males	166	105	121	91	51	n.p.	9	n.p.	561
Females	28	29	21	12	10	<5	—	<5	102
Persons	194	134	142	103	61	14	9	6	663
Rate per 100,000 person-years ^(a)									
Males	4.4	3.7	5.6	9.8	4.8	n.p.	n.p.	n.p.	5.0
Females	0.6	0.8	0.8	1.0	0.8	n.p.	—	n.p.	0.7
Persons	2.3	2.1	3.0	4.4	2.9	2.1	n.p.	n.p.	2.7
2012									
Number									
Males	142	126	130	86	n.p.	n.p.	n.p.	—	540
Females	31	22	32	21	<5	<5	<5	—	112
Persons	173	148	162	107	38	15	9	—	652
Rate per 100,000 person-years ^(a)									
Males	3.6	4.3	5.8	8.8	n.p.	n.p.	n.p.	—	4.6
Females	0.7	0.6	1.2	2.1	n.p.	n.p.	n.p.	—	0.8
Persons	2.0	2.3	3.3	4.4	1.8	2.1	n.p.	—	2.6

(a) Directly age-standardised using the 2001 Australian standard population.

n.p. Not published due to small numbers.

Table A6: New cases of mesothelioma by age group, 2013

Age group	Number	Per cent
Less than 40	3	0.5
40–44	6	1.0
45–49	5	0.9
50–54	15	2.6
55–59	28	4.9
60–64	58	10.1
65–69	73	12.7
70–74	108	18.8
75–79	110	19.1
80–84	101	17.6
85–89	43	7.5
90 and over	25	4.3
Total	575	100.0

Table A7: New cases of mesothelioma and age-specific incidence rates by sex and age group, 2013

Sex	<55	55–59	60–64	65–69	70–74	75–79	80–84	85+	Total
Number									
Males	20	21	43	58	87	97	82	57	465
Females	9	7	15	15	21	13	19	11	110
Persons	29	28	58	73	108	110	101	68	575
Rate per 100,000 person-years^(a)									
Males	0.2	3.1	7.0	10.8	22.7	35.0	42.3	36.4	4.0
Females	n.p.	n.p.	2.4	2.8	5.3	4.2	7.5	3.9	0.9
Persons	0.2	2.0	4.7	6.7	13.8	18.7	22.7	15.5	2.5

(a) Age-specific rates using the Australian estimated resident population at 30 June 2013.

n.p. Not published due to small numbers.

Table A8: New cases of mesothelioma and age-standardised incidence rates by year of diagnosis and sex, 1982 to 2013

Year	Males	Females	Persons	Males	Females	Persons
	Number			Rate per 100,000 person-years ^(a)		
1982	134	22	156	2.3	0.3	1.2
1983	131	15	146	2.1	0.2	1.1
1984	149	17	166	2.4	0.2	1.2
1985	178	24	202	3.0	0.3	1.5
1986	195	30	225	3.0	0.4	1.6
1987	174	29	203	2.6	0.4	1.4
1988	246	31	277	3.9	0.4	1.9
1989	229	40	269	3.5	0.5	1.8
1990	257	34	291	3.9	0.4	1.9
1991	260	47	307	3.7	0.6	2.0
1992	287	39	326	4.0	0.5	2.1
1993	318	51	369	4.4	0.6	2.3
1994	373	47	420	5.0	0.5	2.6
1995	334	59	393	4.5	0.7	2.4
1996	362	53	415	4.7	0.6	2.4
1997	393	75	468	5.0	0.8	2.7
1998	412	61	473	5.1	0.6	2.6
1999	400	76	476	4.9	0.8	2.6
2000	403	77	480	4.8	0.8	2.6
2001	467	107	574	5.4	1.0	3.0
2002	455	108	563	5.1	1.0	2.8
2003	540	112	652	5.9	1.0	3.2
2004	511	93	604	5.5	0.8	2.9
2005	500	113	613	5.2	1.0	2.9
2006	486	103	589	4.9	0.9	2.7
2007	565	109	674	5.6	0.9	3.0
2008	548	116	664	5.3	0.9	2.9
2009	543	130	673	5.1	1.0	2.9
2010 ^(b)	543	124	667	4.9	1.0	2.8
2011	561	102	663	5.0	0.7	2.7
2012	540	112	652	4.6	0.8	2.6
2013	465	110	575	3.9	0.8	2.2

(a) Directly age-standardised using the 2001 Australian standard population.

(b) AMR data are available from 1 July 2010 only. For the 6-month period 1 July–31 December 2010, 338 cases have been reported to the AMR: 274 males and 64 females.

Source: 1982 to 2010: (AIHW 2014). 2011 to 2013: AMR.

Table A9: Deaths of people diagnosed with mesothelioma in 2011 and 2012, by state and territory

Deaths	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
2011									
Number	165	118	122	87	51	14	9	6	572
Per cent of patients diagnosed	85.0	88.0	85.9	84.5	83.6	100.0	100.0	100.0	86.3
2012									
Number	124	113	118	76	24	10	7	—	472
Per cent of patients diagnosed	71.7	76.4	72.8	71.0	63.2	66.7	77.8	—	72.4

Note: Death information from the NDI where available, otherwise from state/territory cancer registries.

Table A10: Cause of death known for people diagnosed with mesothelioma in 2011 and 2012

Cause of death	2011		2012	
	No.	Per cent	No.	Per cent
Mesothelioma	256	89.2	119	95.2
Not mesothelioma	28	9.8	6	4.8
Unknown ^(a)	3	1.0	—	—
Total	287	100.0	125	100.0

(a) For these cases, the underlying cause of death is known, but the information has not been released to the AMR. These are cases that have been before the Coroner.

Note: Includes cause of death information from the NDI where available, otherwise from state/territory cancer registries.

Glossary

Best basis of diagnosis: The most valid basis of diagnosis in a person with cancer.

Cytology: Examination of cells from a primary or secondary site, including fluids aspirated by endoscopy or needle; also includes the microscopic examination of peripheral blood and bone marrow aspirates.

Histology: Microscopic examination of cells and tissues.

Job-specific module (JSM): Telephone questionnaire modules that are specific to certain kinds of jobs and industries. The MonCOEH team allocate JSMs to be administered to each patient in their telephone interview, based on the job history provided by the patient in the postal questionnaire. The purpose of a JSM is to ask a systematic sequence of questions about the job in question in order to elicit specific information needed to estimate that individual's asbestos exposure in that job. A non-occupational module is administered to all patients who consent to a telephone interview.

Laterality: The side of a paired organ that is the origin of the primary cancer in a person with cancer.

Mesothelioma: An aggressive form of cancer that arises in the mesothelium, membranous tissue that surrounds some body organs and cavities.

Morphology: The histological classification of the cancer tissue (histopathological type) in a person with cancer, and a description of the course of development that a tumour is likely to take: benign or malignant (behaviour).

National Death Index (NDI): A database which contains records of all deaths occurring in Australia since 1980.

Notification: A case of mesothelioma provided to the AMR from the state and territory cancer registries. Each notification contains demographic information, diagnosis information and, if relevant, death information. All notifications of cancer are first notified to the state and territory cancer registries from pathology laboratories, radiotherapy and medical oncology departments, and hospitals.

OccIDEAS (Occupational Integrated Database Exposure Assessment System): A secure, web-based survey tool used in research projects where accurate, subject-specific exposure assessment is needed. It is a computerised interview tool for collecting exposure data from individual subjects. OccIDEAS also manages and organises the exposure information and is programmed to calculate exposure assessments automatically by algorithm and/or utilising case-by-case expert judgement. OccIDEAS is based on a modular structure which enables each interview to be customised to the particular subject based on their work history and other information collected in the postal questionnaire (MacFarlane et al. 2012).

Self-notifier: A person diagnosed with mesothelioma who notifies the AMR of their diagnosis.

Topography: The site in which the tumour originated in a person with cancer.

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