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Skin cancer in Australia

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Authoritative information and statistics to promote better health and wellbeing

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Australian Institute of Health and Welfare
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Digital and Media Communications Unit
Australian Institute of Health and Welfare
GPO Box 570
Canberra ACT 2601
Tel: (02) 6244 1000
Email: info@aihw.gov.au

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Please note that there is the potential for minor revisions of data in this report. Please check the online version at <www.aihw.gov.au> for any amendments.

Contents

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Abbreviations

ABS	Australian Bureau of Statistics
ACD	Australia Cancer Database
AIHW	Australian Institute of Health and Welfare
BCC	basal cell carcinoma
CI	confidence interval
DNA	deoxyribonucleic acid
ICD	International Classification of Diseases
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification
NHMD	National Hospital Morbidity Database
NMSC	non-melanoma skin cancer
SCC	squamous cell carcinoma
UV	ultraviolet

Summary

Skin cancer in Australia provides comprehensive national information and statistics on skin cancer. It includes the latest available data and estimates to 2016, as well as trends over time. The report also describes risk factors, and presents a section on the limitations of non-melanoma skin cancer (NMSC) data in Australia, as well as future opportunities.

Skin cancer is a major cause of illness in Australia

Skin cancer accounts for the largest number of cancers diagnosed in Australia each year.

In 2016, an estimated 13,280 new cases of melanoma will be diagnosed in Australia, and 1,770 people will die from this disease. The age-standardised incidence rate of melanoma has increased from 27 cases per 100,000 in 1982 to 49 per 100,000 in 2016. However, for people aged less than 40 the incidence rate has dropped from a peak of 13 cases per 100,000 in 2002 to an estimated 9.4 per 100,000 in 2016. Between 1982 and 2016, the age-standardised mortality rate has risen from 4.7 deaths per 100,000 to an estimated 6.2 deaths per 100,000.

The total number of new cases of NMSC is unknown because the most recent data available for the two most commonly diagnosed NMSCs is for 2002. NMSC was estimated to account for more cases diagnosed than all other cancers combined in 2002. In 2016, an estimated 560 people will die from NMSC, with a mortality rate of 1.9 deaths per 100,000 people.

Hospitalisations for skin cancer are on the rise

In 2013–14, there were 23,437 melanoma-related hospitalisations in Australia, a 63% rise from 2002–03 (14,348). In 2013–14, 20,100 dermatological and plastic melanoma-related procedures and 4,727 melanoma-related chemotherapy procedures were performed.

In 2013–14, there were 114,722 NMSC-related hospitalisations in Australia, a 39% rise from 2002–03 (82,431). In 2013–14, 250,011 dermatological and plastic melanoma-related procedures and 1,582 melanoma-related chemotherapy procedures were performed.

Survival from melanoma is relatively high

In 2007–2011, people diagnosed with melanoma had a 90% chance of surviving at least five years compared with their counterparts in the general Australian population. This is much higher than the five-year survival rate for all cancers combined (67%). Five-year relative survival rates reduced with increasing age, from 95% for people aged 0–39 to 80% for those aged 80 and over.

Melanoma is less common among Aboriginal and Torres Strait Islander people

In 2005–2009, the age-standardised incidence rate for Indigenous Australians was 9.3 cases per 100,000, compared with 33 cases per 100,000 for non-Indigenous Australians.

There is substantial spending on skin cancer each year

In 2014, 40,179 ($9.4 million) Medicare benefits claims were paid for melanoma and 959,243 ($127.6 million) for NMSC. In 2008–09, NMSC accounted for 8.1% of all health system spending on cancer in Australia (excluding cancer screening).

1 Introduction

This report is one of a series of brief reports developed under the framework of the National Centre for Monitoring Cancer under the guidance of the Cancer Monitoring Advisory Group. Each report incorporates a 'spotlight' section that highlights a particular issue associated with a specific cancer or cancer-related topic.

Cancer (also called malignant neoplasm) is a diverse group of diseases characterised by the uncontrolled proliferation of abnormal cells. These abnormal cells invade and damage the tissues around them, and might then spread to other parts of the body, which can cause further damage and potentially death (AIHW & AACR 2014).

Cancers are distinguished from each other by where in the body the disease began (known as the primary site), and/or by the type of cell involved (known as histology). For example, cancer that begins in the lung is called lung cancer (primary site), regardless of whether or not it has spread to other sites. The spread of cancerous cells from the primary cancer site to another (secondary) site is referred to as metastasis (see Glossary) (AIHW & AACR 2014).

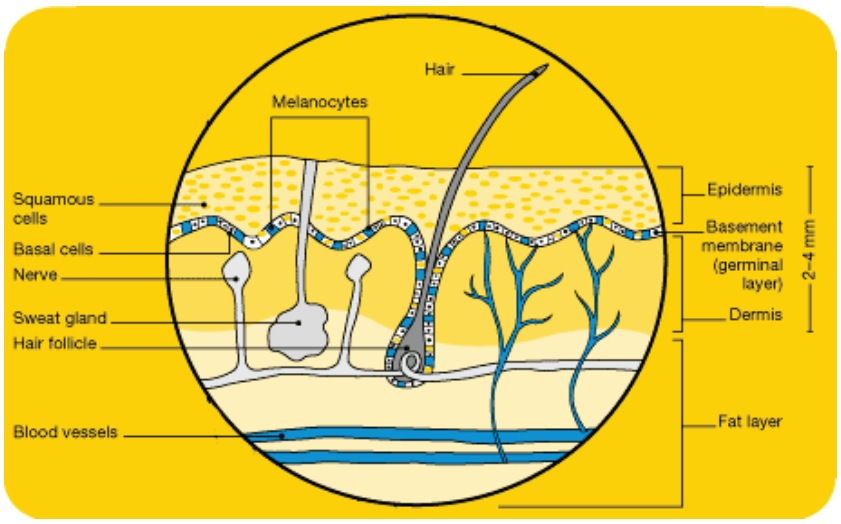
Skin cancer does not refer to a single type of cancer—it is used to describe various malignancies that can originate in the skin.

The skin

The skin is the largest organ in the human body. Its main functions include protecting the inner layers and organs from external elements, regulating body temperature and preventing dehydration (Cancer Council Victoria 2012a).

The three main types of skin cells in the human body (Figure 1.1) are:

- basal cells, which make up the lower layer of the skin
- squamous cells, which make up the top layer of skin
- melanocytes, which produce dark pigment that gives colour to the skin (melanin).



Source: Cancer Council Victoria 2012a.

Figure 1.1: Layers of skin

About this report

This report presents the latest available data and statistics on:

- melanoma of the skin
- non-melanoma skin cancer (NMSC).

Data for NMSC can be further broken down into:

- common NMSCs, comprising basal cell carcinoma (BCC) and squamous cell carcinoma (SCC)
- rare NMSCs (see Appendix B for list of histology types).

Data availability

The primary data set used to produce this report is the Australia Cancer Database (ACD), which contains information on Australians diagnosed with primary, invasive cancer (excluding BCC and SCC of the skin). As only rare NMSC are reportable to cancer registries and appear in the ACD, incidence data presented in this report are for melanoma of the skin and rare NMSC only (see Box 1.1).

Common NMSCs include basal cell carcinomas (BCC) and squamous cell carcinomas (SCC), and these are not reportable to cancer registries. As a result, in this report, incidence rates for BCCs and SCCs are based on the national non-melanoma skin cancer surveys conducted in 1998, 1990, 1995 and 2002 (NCCI 2003). Age-standardised incidence rates of BCCs and SCCs are presented using the most recent 2002 survey, but they might have changed substantially since then.

Other datasets used in this report include the National Hospital Morbidity Database (NHMD) and the National Mortality Database. In these datasets, NMSC data include both common NMSC (BCC and SCC) and rare NMSC. However, data are only available for total NMSC, and cannot be further broken down into specific types of NMSC (see Box 1.1).

Box 1.1 Skin cancer data sources

Melanoma of the skin (melanoma)

Melanoma data are available in the ACD, NHMD and National Mortality Database.

Non-melanoma skin cancer (NMSC)

NMSC data are not fully available in the ACD. The ACD only includes information on rare NMSC. Common NMSC (BCC and SCC) are not available on the ACD and are sourced from the national non-melanoma skin cancer surveys.

NMSC data are available in the NHMD and National Mortality Database, but cannot be further broken down into subtypes.

Estimated incidence and mortality data

This report includes incidence data estimates for 2013–2016, and mortality data estimates for 2014–2016. All estimated data described in text are rounded, so the numbers might not add up to the totals. Note that actual data are not rounded.

2 Facts about skin cancer

Skin cancer is the uncontrolled growth of abnormal cells in the skin (Skin Cancer Foundation 2013). It is a major population health issue in Australia, with an estimated 2 in 3 Australians being diagnosed with skin cancer by the age of 70 (Cancer Council Australia 2013). While the number of Australians diagnosed with skin cancer is high, mortality associated with it is low. This could be due to long-running public education campaigns and treatment options (Cancer Council Australia 2013).

In 2008–09, NMSC accounted for 8.1% of all health system spending on cancer in Australia (excluding population health screening programs) (AIHW 2013).

Melanoma of the skin

Melanoma starts from cells in the skin called melanocytes. The melanocytes produce melanin that gives colour to the skin. It appears on the skin as a new spot or irregular spot that changes colour (Skin Cancer Foundation 2013). Melanoma can grow quickly. It is the most deadly form of skin cancer due to its susceptibility to metastases (Gloster & Brodland 1996).

Males are generally more likely to develop melanoma than females. This is often attributed to increased exposure to ultraviolet (UV) radiation from the sun, potentially due to working outdoors, which is predominantly done by males, and their higher participation in outdoor sporting activities (Broadstock 1991). Males are also more likely to develop skin cancer in areas out of direct view, such as the back and chest. This often results in diagnosis at an advanced stage when it is more difficult to treat (Cancer Research UK 2013).

Non-melanoma skin cancer

NMSC is any form of skin cancer that starts in skin cells other than the melanocytes (ACS 2014a). The two most common forms of NMSC are basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). In 2002, BCC accounted for about two-thirds of NMSC cases, with most other NMSC comprising SCC (Staples et al. 2006). There are also other rare types of NMSC, which include, but are not limited to Merkel cell carcinoma, dermatofibrosarcoma, and cutaneous lymphoma (see Appendix B for full list of histology types).

BCCs start at the base of skin cells (basal cells). BCCs usually develop on areas of the skin that have more exposure to UV radiation, including the face, neck and arms. They tend to grow slowly, and usually do not spread to other parts of the body. BCCs are generally easy to treat when they are small, but the chance of a person being diagnosed a second time increases with the size of the first cancer (Cancer Council Victoria 2012b).

SCC starts in the upper most skin cells (squamous cells). SCCs can grow quickly, and, if left untreated, can spread to other parts of the body.

Risk factors for skin cancer

A risk factor is any factor associated with an increased likelihood of a person developing a health disorder or health condition, such as cancer. Understanding what causes a cancer is essential in establishing processes and policies designed to successfully prevent, detect and treat the disease. The list of skin cancer risk factors has been sourced from the *World cancer report 2014* (IARC 2014) and *Food, nutrition, physical activity and the prevention of cancer* (WCRF & AICR 2007).

Skin cancer is mostly a preventable disease (Olsen et al. 2015). Evidence suggests that regular use of sunscreen reduces the risk of developing melanoma and SCCs, but is inconclusive for BCCs (Green et al. 1999; Green et al. 2011).

Ultraviolet (UV) radiation

Skin cancer is predominantly a result of over-exposure to UV radiation, most commonly from the sun (Wikonkal & Brash 1999). There is substantial evidence that UV radiation from the sun can damage deoxyribonucleic acid (DNA) directly, which can lead to skin cancer.

The risk of developing skin cancer rises with the level of a person's exposure to UV radiation, particularly from repeated exposure over a lifetime with episodes of severe sunburn (Armstrong & Kricker 2001).

Solariums are artificial UV radiation tanning devices used for skin tanning. They can emit up to 5 times the UV radiation of the midday summer sun. Evidence points to a link between the use of solariums and an increased risk of developing skin cancer (Walter et al. 1990).

Family history and genetic susceptibility

Studies suggest that people with one or more first-degree relatives with melanoma are at a greater risk of being diagnosed with melanoma. A first-degree relative is a family member who shares about half their genes with an individual (for example, mother, father, sister, brother, daughter, son). Studies also suggest that people with a family history of melanoma are more likely to have more superficial spreading melanomas (Ford et al. 1995).

Studies show that people with a family history of NMSC are at a significantly higher risk of developing NMSC than the general population (Herity et al. 1989).

Skin pigmentation or the presence of melanin protects the skin from the sun. People with fair complexion often lack melanin, which makes them more susceptible to skin cancer.

Skin cancer in people with darker skin is less common than for people with lighter skin. However, skin cancer in people with darker skin is often associated with higher mortality and morbidity. This is attributed to these cancers being detected at a later stage, with more deeply invasive lesions, making the cancer more life threatening (Gloster Jr & Neal 2006).

There is a strong association between the number of benign nevi or moles on a person's body and the risk of diagnosis of melanoma—the greater the number of benign nevi or moles, the greater the likelihood of diagnosis (D'Arcy et al. 1984).

3 Melanoma

In 2012, Australia had the world's second highest incidence rate of melanoma, at 35 new cases a year per 100,000 people (slightly behind New Zealand, at 36 per 100,000). This was more than 11 times as high as the estimated average worldwide rate (3 per 100,000) (Globocan 2012). Melanoma is the fourth most commonly diagnosed cancer in Australia (AIHW & AACR 2014).

Evidence suggests that exposure to UV radiation increases the risk of developing melanoma, but the risk is not directly proportional to the level of exposure. Studies show a strong association between intermittent sun exposure and the risk of melanoma (Hacker 2011). Changes in incidence and mortality rates over time might be related to long-running public education campaigns on the effects of sun exposure and treatment options (Cancer Council Australia 2013).

Incidence

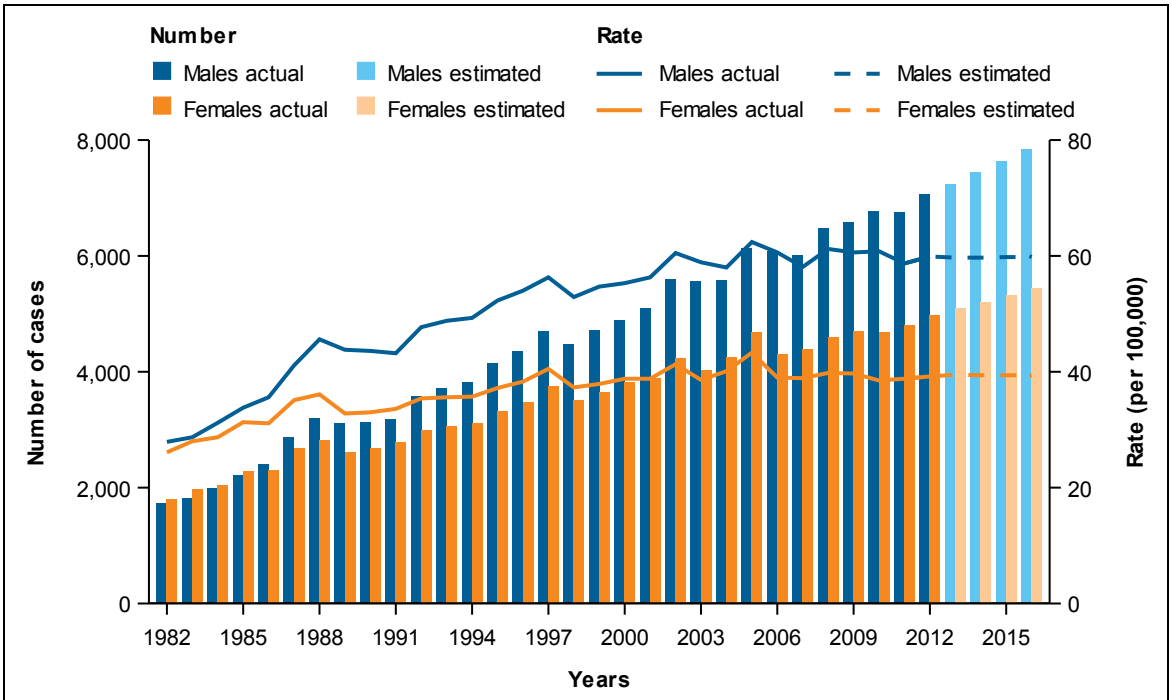
Sex

In 2016, it is estimated that:

- 13,280 new cases of melanoma will be diagnosed in Australia, accounting for 10% of all cancers diagnosed (excluding BCCs and SCCs)
- males will represent a higher proportion of new cases (7,850) than females (5,440) (59% compared with 41%)
- the age-standardised incidence rate will be 49 cases per 100,000
- the age-standardised incidence rate will be higher for males (60 per 100,000) than females (39 per 100,000).

From 1982 to 2016:

- the number of melanomas diagnosed in Australia increased from 3,526 to an estimated 13,280
- the age-standardised incidence rate increased from 27 cases per 100,000 in 1982 to an estimated 49 cases per 100,000 in 2016
- the age-standardised incidence rate increased for both males and females, from 28 to 60 cases per 100,000 males, and from 26 to 39 cases per 100,000 females
- since 2006, the age-standardised incidence rate has remained relatively stable for both males and females (Figure 3.1).



Notes

1. Cancer coded in International Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. The data for this figure are in Table A1.

Source: ACD 2012.

Figure 3.1: Trends in the number of new cases diagnosed and incidence rate for melanoma, by sex, 1982–2012 (actual data) and 2013–2016 (estimated data)

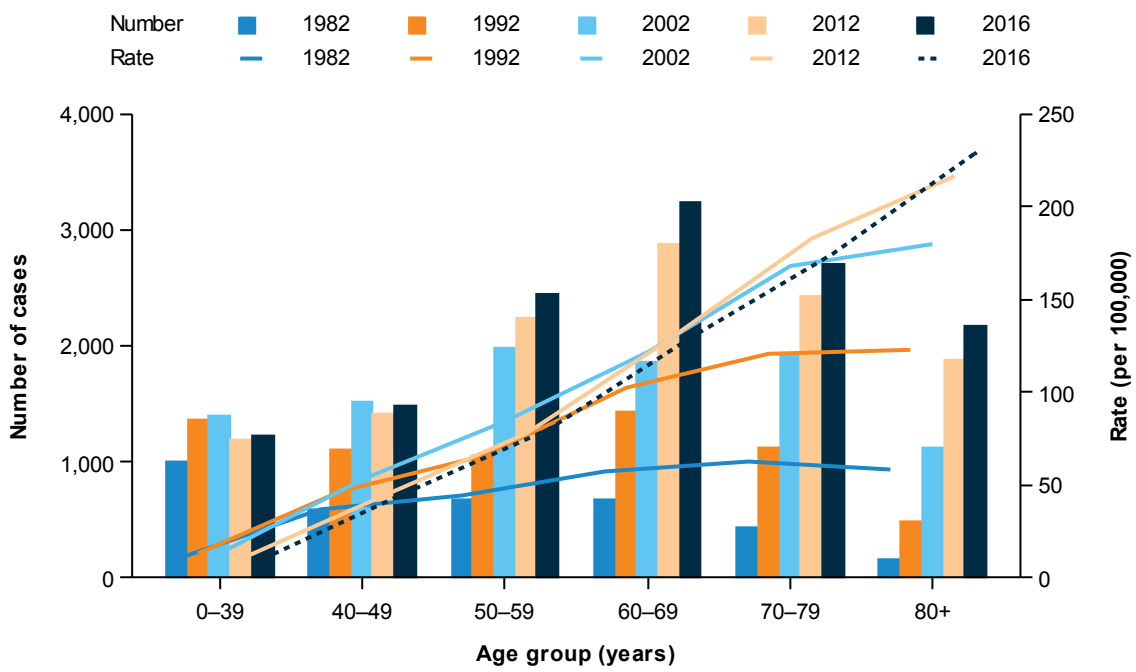
Age group

In 2016, it is estimated that:

- people aged 60–69 will account for the highest proportion of new cases, at 24% (3,250)
- people aged 80 and over will have the highest age-specific incidence rate (229 cases per 100,000).

From 1982 to 2016:

- the number of melanomas diagnosed increased for all age groups
- the age-specific incidence rate increased for all age groups, except for people aged 0–39, who had a decrease from a peak of 13 cases per 100,000 in 2002 to an estimated 9.4 cases per 100,000 in 2016
- people aged 80 and over had the highest proportional increase in the age-specific incidence rate, rising 5 fold (from 58 cases per 100,000 to 229 cases per 100,000) (Figure 3.2).



Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-specific, and are expressed per 100,000 population.
3. The data for this figure are in Table A2.

Source: ACD 2012.

Figure 3.2: Number of new cases and age-specific incidence rates for melanoma, by age group, 1982, 1992, 2002, 2012 (actual data) and 2016 (estimated data)

Hospitalisations

Data for this section are sourced from the National Hospital Morbidity Database (NHMD), which contains data on admitted patients who undergo a hospital's admission process to receive treatment. A separation is an episode of admitted patient care, which can be a total hospital stay (from admission to discharge, transfer or death) or a proportion of a hospital stay beginning or ending in a change of type of care (for example, from acute care to rehabilitation). In this report, hospital separations are referred to as hospitalisations. For more information about the NHMD, see Appendix D and F.

In this report, melanoma-related hospitalisations are defined as those where:

- the principal diagnosis (the diagnosis established after study to be chiefly responsible for the episode of admitted patient care) is a melanoma
- the additional diagnosis (a condition or complaint that either coexists with the principal diagnosis or arises during the episode of care and affects patient management) is a melanoma.

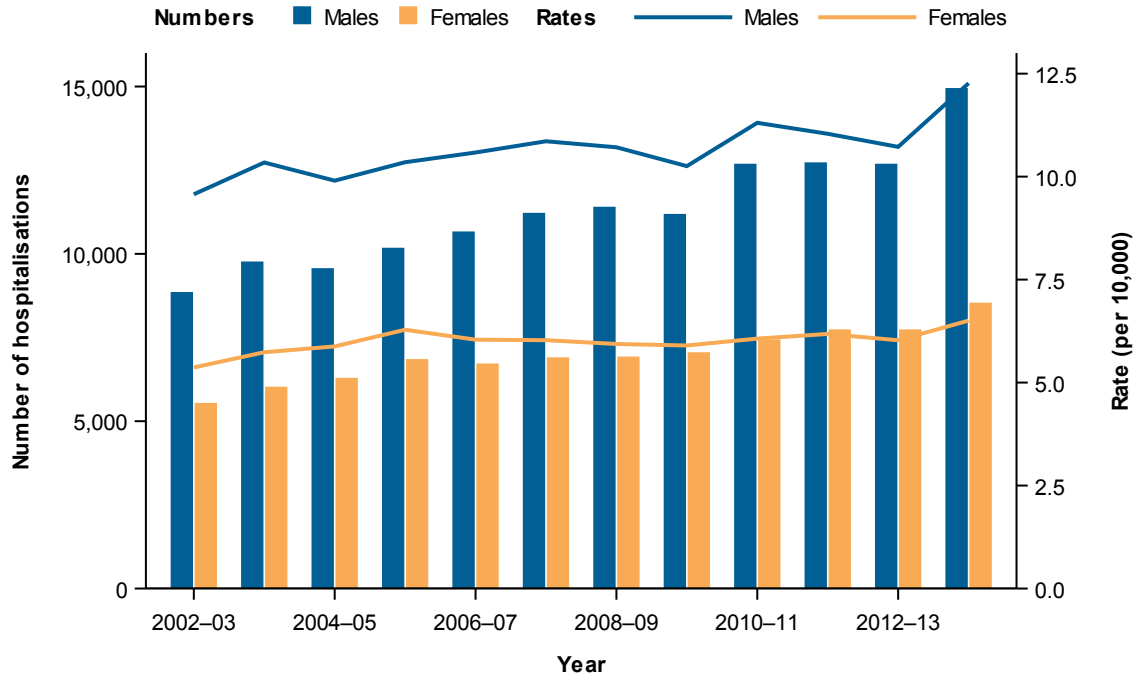
Number of hospitalisations and hospitalisation rate

In 2013–14:

- there were 23,437 melanoma-related hospitalisations, with males accounting for a higher proportion than females (64% compared with 36%)
- the age-standardised hospitalisation rate for melanoma was 9.2 hospitalisations per 10,000, with males having a higher rate than females (12 per 10,000 compared with 6.5 per 10,000).

From 2002–03 to 2013–14:

- the number of melanoma-related hospitalisations increased by 63% (from 14,348 to 23,437), with males rising by 69% (8,830 to 14,925) and females by 54% (5,518 to 8,512)
- the age-standardised hospitalisation rate increased from 7.3 hospitalisations per 10,000 to 9.2 per 10,000, with males rising from 9.6 to 12 per 10,000, and females rising from 5.4 to 6.5 per 10,000 (Figure 3.3).



Notes

1. Hospitalisation for which the care type was reported as 'Newborn with no qualified days' and records for 'Hospital boarders' and 'Posthumous organ procurement' have been excluded from the analysis.
2. Hospitalisations in which the principal diagnosis is melanoma (ICD-10-AM code C43).
3. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 10,000 population.
4. The data for this figure are in Table A3a.

Source: NHMD.

Figure 3.3: Trends in the number of hospitalisations and hospitalisation rates for melanoma, by sex, 2002–03 to 2013–14

Treatment of melanoma

Treatment of melanoma varies depending on the stage of the cancer, its location on the body, and the age and sex of the patient. Treatments may include surgery, chemotherapy and radiotherapy. Advances in technologies could lead to more targeted biological therapies.

In this section, data presented include surgery and chemotherapy. Other treatments have not been presented due to data limitations, such as small numbers of people undergoing those treatments.

Hospitalisations involving surgery

Two main types of surgical dermatological and plastic procedures for the treatment of melanoma are reported in this chapter: excision and repair. Excision involves the removal of a lesion of skin and subcutaneous tissue. This includes Moh's surgery (the microscopically controlled removal of a lesion), and amputation, and repair procedures like grafting (ACS 2014b) (See Appendix D). Repair involves removing a section of undamaged skin, and transferring it to where the excision occurred.

In 2013–14, 20,100 dermatological and plastic melanoma-related procedures were performed. Of these, there were:

- 15,574 excision procedures, representing 77% of dermatological and plastic procedures
- 4,526 repair procedures, representing 23% of dermatological and plastic procedures.

From 2002–03 to 2013–14:

- the overall number of melanoma-related dermatological and plastic procedures increased by 55%, from 12,973 to 20,100. This compares to an estimated increase of 32%, from 9,582 to 12,644 in the number of melanomas diagnosed during a similar period (2003 to 2014)
- the number of excision procedures increased by 50%, from 10,415 to 15,574
- the number of repair procedures increased by 77%, from 2,558 to 4,526 (Table 3.1).

Table 3.1: Number and percentage of surgeries for melanoma, by type of surgery, 2002–03 to 2013–14

	Excision surgery		Repair surgery	
Year	Number	%	Number	%
2002–03	10,415	80.3	2,558	19.7
2003–04	11,411	79.7	2,899	20.3
2004–05	11,110	79.5	2,861	20.5
2005–06	11,884	79.6	3,048	20.4
2006–07	11,681	78.3	3,229	21.7
2007–08	12,499	79.2	3,290	20.8
2008–09	11,728	76.3	3,634	23.7
2009–10	11,746	76.7	3,568	23.3
2010–11	11,822	74.8	3,974	25.2
2011–12	12,345	74.6	4,166	25.4
2012–13	12,740	74.1	4,442	25.9
2013–14	15,574	77.5	4,526	22.5

Notes

1. Hospitalisation for which the care type was reported as 'Newborn with no qualified days' and records for 'Hospital boarders' and 'Posthumous organ procurement' have been excluded from the analysis.
2. Number of surgeries where cancer-related hospitalisation was melanoma (ICD-10-AM code C43).
3. Percentage of dermatological and plastic procedures.

Source: NHMD.

Chemotherapy

Chemotherapy is the use of drugs to destroy cancer cells, usually by stopping the cancer cells' ability to grow and divide (ASCO 2015). The number and rate of melanoma chemotherapy procedures in this report might be an under-count of actual procedures. This is because public hospitals in New South Wales, South Australia and the Australian Capital Territory provide same-day chemotherapy on a non-admitted basis, which means that information on these services are not collected in the NHMD.

In 2013–14, 4,727 melanoma-related chemotherapy procedures were performed, representing 20% of all melanoma-related hospitalisations.

From 2002–03 to 2013–14:

- the number of melanoma-related chemotherapy procedures more than doubled, from 2,093 to 4,727. This compares to an estimated increase of 32% in the number of melanomas diagnosed during a similar period (2003 to 2014) from 9,582 to 12,644
- the proportion of melanoma-related hospitalisations involving chemotherapy increased from 15% to 20%.

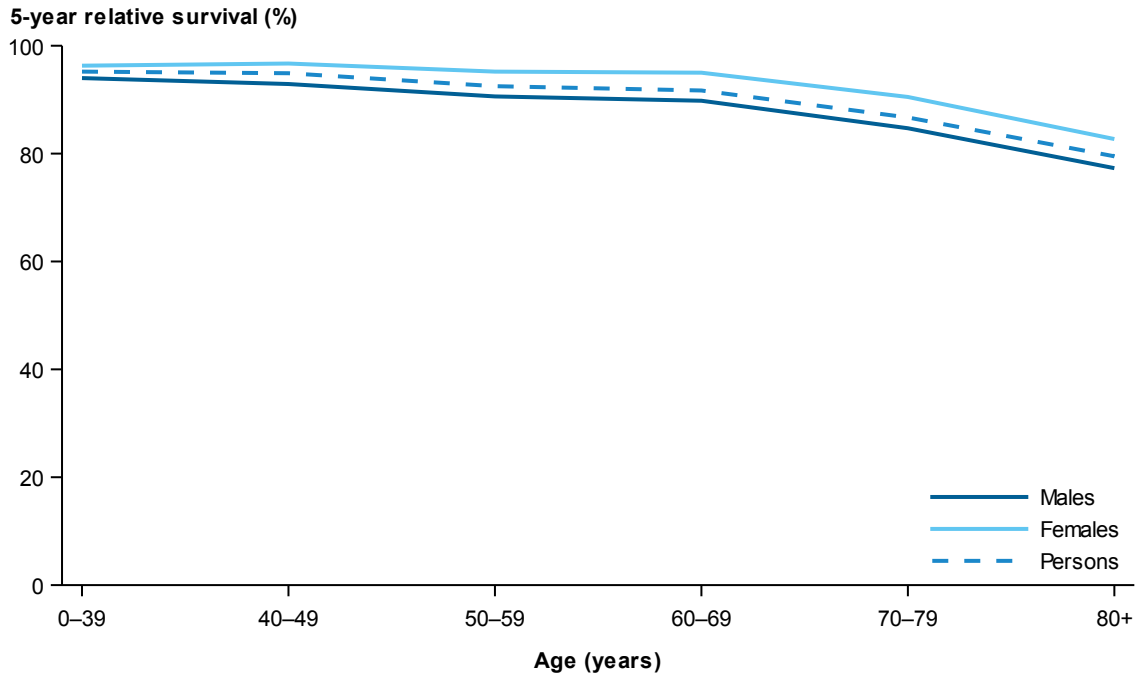
Survival

Information about survival from cancer provides an indication of cancer prognosis and the effectiveness of the treatments available. Various factors influence survival, including demographic characteristics of the patient (such as age, sex and genetics), the nature of the tumour (such as site, stage at diagnosis and histology type) and the health-care system (such as the availability of health care services, diagnostic and treatment facilities, and follow-up services) (Black et al. 1998; Wiseman 2008).

In this report, survival refers to 'relative survival'—that is, all survival probabilities presented are relative to those of the general population. It refers to the probability of being alive for a given amount of time after diagnosis compared with that for those of the general population. An estimate of less than 100% suggests that those with melanoma had a lower chance of survival than the general population. Relative survival was calculated with the period method, using the period 2007–2011 (Brenner & Gefeller 1996).

Between 2007 and 2011, five-year relative survival was 90% for melanoma. This means that people diagnosed with melanoma had a 90% chance of surviving for at least five years from the time of diagnosis compared with comparable people in the general population.

Females had higher five-year relative survival than males (94% compared with 88%). The 5-year relative survival from melanoma reduced with increasing age from 95% for people aged 0–39 to 80% for people aged 80 and over (Figure 3.4).



Notes

1. Cancer coded in ICD-10 as C43.
2. Data for this figure are in Table A4.

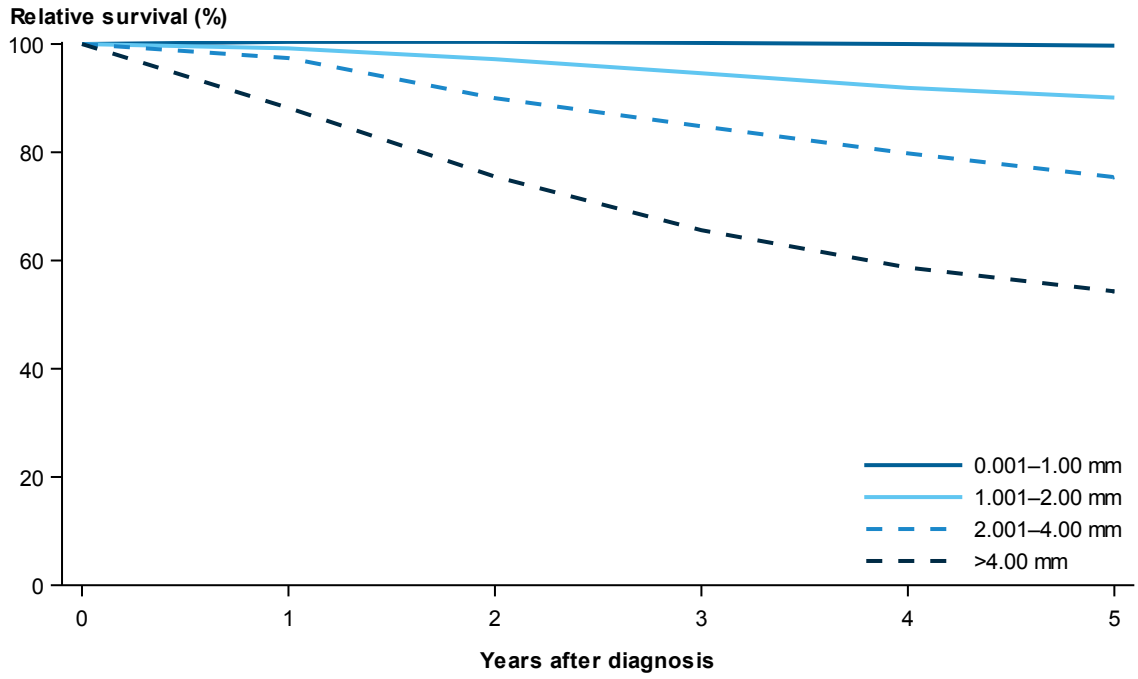
Source: ACD 2011.

Figure 3.4: Five-year relative survival from melanoma, by sex and age, 2007–2011

Tumour thickness

Survival from melanoma varies considerably depending on the thickness of the tumour at the time of diagnosis. Tumour thickness is the most important factor in the successful treatment of melanoma. Survival decreases considerably with every millimetre increase in thickness of melanoma (Balch et al. 2001).

In 2007–2011, five-year relative survival decreased with increasing thickness of the melanoma at the time of diagnosis. The survival was almost 100% for small tumours of 0.001 to 1.00 millimetre, then decreased to 54% for tumours greater than 4.00 millimetres.



Notes

1. Cancer coded in ICD-10 as C43.
2. Data for this figure are in Table A5.

Source: ACD 2011.

Figure 3.5: Five-year relative survival from melanoma, by tumour thickness, 2007–2011

Mortality

Mortality data presented in this report were sourced from the AIHW National Mortality Database, which contains information provided by the Registries of Births, Deaths and Marriages and the National Coroners Information System (managed by the Victorian Department of Justice). The information is then coded by the Australian Bureau of Statistics. The National Mortality Database contains information on deaths registered in Australia from 1964 to 2013.

Melanoma is responsible for the highest number of deaths from skin cancer in Australia.

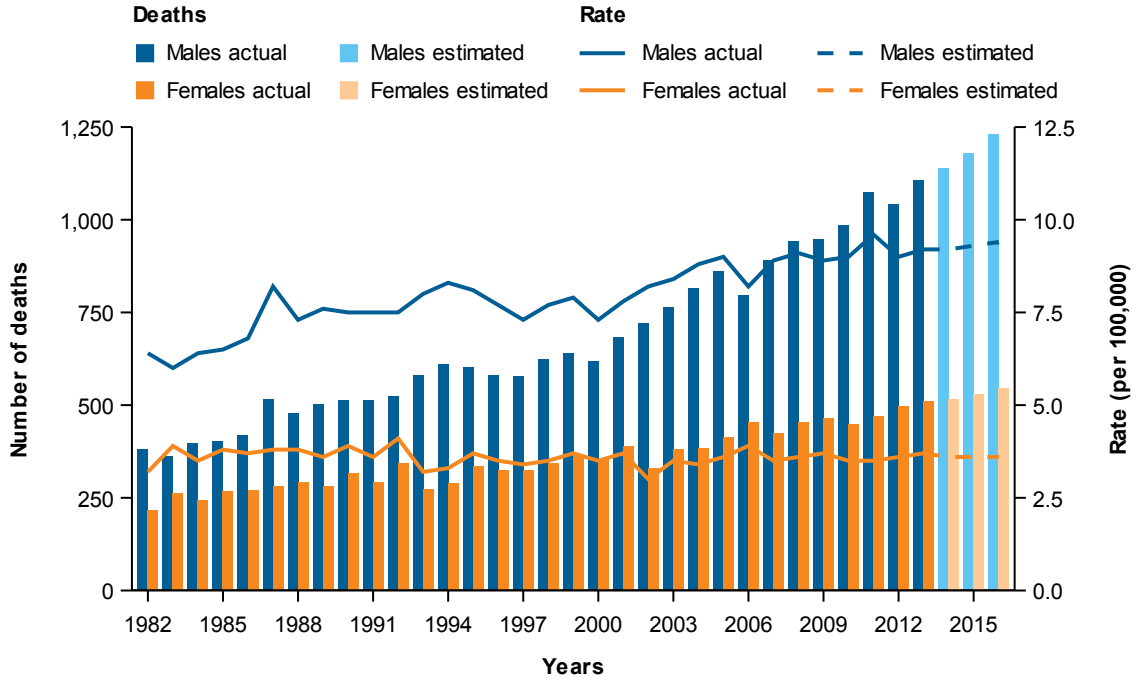
Sex

In 2016, it is estimated that:

- 1,770 people will die from melanoma, accounting for 3.8% of all deaths from cancer (46,880)
- males will have a higher proportion of deaths from melanoma (1,230) than females (545) (69% compared with 31%)
- the age-standardised mortality rate will be 6.2 deaths per 100,000
- males will have a higher age-standardised mortality rate (9.4 deaths per 100,000) than females (3.6 deaths per 100,000).

From 1982 to 2016:

- the number of deaths from melanoma almost tripled from 596 to an estimated 1,770
- there was a larger rise in the number of deaths from melanoma for males (380 to an estimated 1,230) than females (216 to an estimated 545)
- the age-standardised mortality rate increased from 4.7 deaths per 100,000 people to an estimated 6.2 deaths per 100,000
- the age-standardised mortality rate increased for both males (6.4 deaths per 100,000 to an estimated 9.4 per 100,000) and females (3.2 deaths per 100,000 to an estimated 3.6 per 100,000) (Figure 3.6).



Notes

1. Deaths registered in 2011 and earlier are based on the final version of death data; deaths registered in 2012 and 2013 are based on revised and preliminary versions, respectively, and are subject to further revision.
2. Melanoma coded in ICD-10 as C43 (for 1997–2013) and in ICD-09 as 172 (for 1982–1996).
3. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
4. The 2014, 2015 and 2016 estimates are based on 2002–2013 mortality data. Estimates are displayed on the graph as a dotted line or as bars in the lighter shade.
5. Actual mortality data from 1982 to 2012 are based on the year of occurrence of the death, and data for 2013 are based on the year of registration of the death.
6. The data for this figure are in Table A6.

Source: AIHW National Mortality Database.

Figure 3.6: Trends in the number of deaths and mortality rates for melanoma, by sex, 1982–2013 (actual data) and 2014–2016 (estimated data)

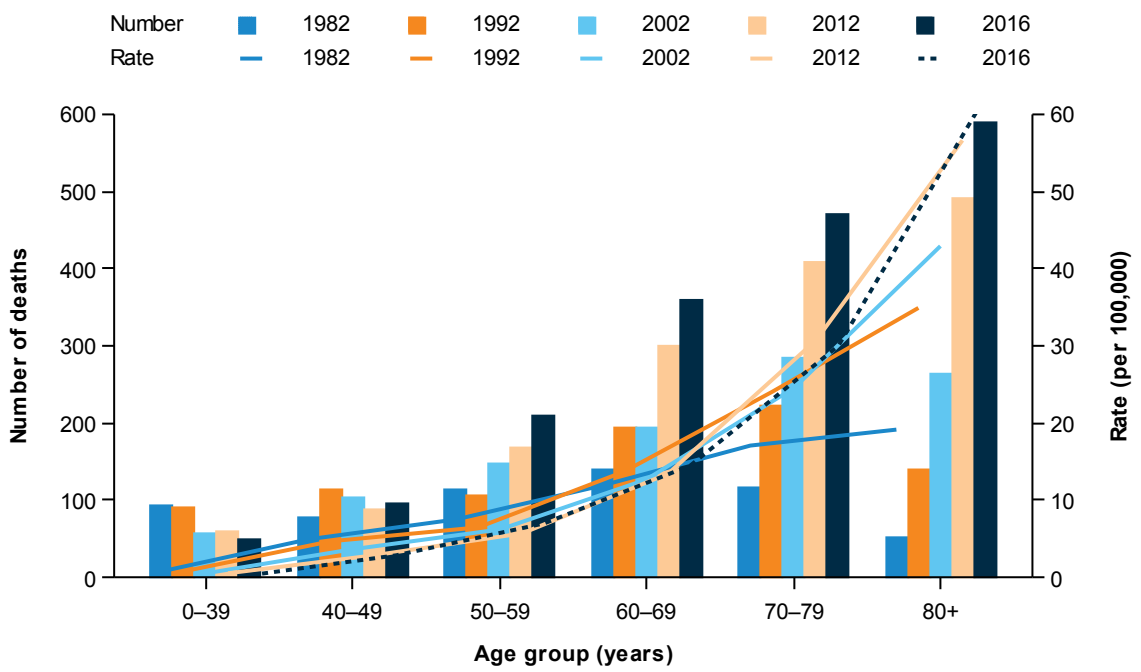
Age group

In 2016, it is estimated that:

- people aged 80 and over will account for the highest proportion of deaths from melanoma, at 33% (590 deaths)
- people aged 80 and over will have the highest age-specific mortality rate, at 62 per 100,000.

From 1982 to 2016:

- the number of deaths from melanoma increased for all age groups, other than for people aged 0–39, where it dropped from 93 deaths to an estimated 50 deaths
- the mortality rate dropped for the three youngest age groups (0–39, 40–49, 50–59), but increased for the three oldest age groups (60–69, 70–79 and 80 and over)
- people aged 80 and over accounted for the largest rise in the age-specific mortality rate (from 19 per 100,000 to an estimated 62 per 100,000) (Figure 3.7).



Notes

1. Deaths registered in 2011 and earlier are based on the final version of death data; deaths registered in 2012 and 2013 are based on revised and preliminary versions, respectively, and are subject to further revision.
2. Melanoma coded in ICD-10 as C43 (for 1997–2013) and in ICD-09 as 172 (for 1982–1996).
3. The rates were age-specific, and expressed per 100,000 population.
4. The 2016 estimates are based on 2002–2013 mortality data.
5. Actual mortality data from 1982 to 2012 are based on the year of occurrence of the death, and data for 2013 are based on the year of registration of the death.
6. The data for this figure are in Table A7.

Source: AIHW National Mortality Database.

Figure 3.7: Number of deaths and age-specific mortality rates for melanoma, by age group, 1982, 1992, 2002, 2012 (all actual data) and 2016 (estimated data)

4 Non-melanoma skin cancer

Incidence data for NMSC are limited because the two most commonly diagnosed NMSCs, basal cell carcinoma and squamous cell carcinoma, are not reportable to cancer registries, so are not included in the ACD. Consequently, incidence data for BCC and SCC in this report have been presented using national NMSC survey data. Four national NMSC surveys have been conducted in Australia (in 1985, 1990, 1995 and 2002) using the same methodology to estimate the incidence rate of BCC and SCC (NCCI 2003).

Incidence numbers for BCC and SCC were released for the 2002 survey but not for previous surveys. Therefore, data presented in this report only include age-standardised incidence rates, not numbers. Data on the incidence of BCC and SCC are only available up until 2002, and have not been estimated for 2003–2016 due to data limitations and the age of the survey. Age-standardised incidence rates for BCC and SCC have been standardised to the World Standard Population (see NCCI 2003 for details) and therefore results are not directly comparable to other incidence rates presented in this report.

For mortality and hospitalisation data, NMSC data include both common NMSC (BCC and SCC) and rare NMSC. However, data are only available for total NMSC, and cannot be further broken down into specific types of NMSC.

Incidence

NMSC was estimated to be the most common form of cancer diagnosed in Australia in 2002, with more NMSC diagnosed each year than all cancers combined (NCCI 2003).

Incidence data in this report for NMSC are presented for:

- basal cell carcinoma
- squamous cell carcinoma
- all rare NMSC (combined).

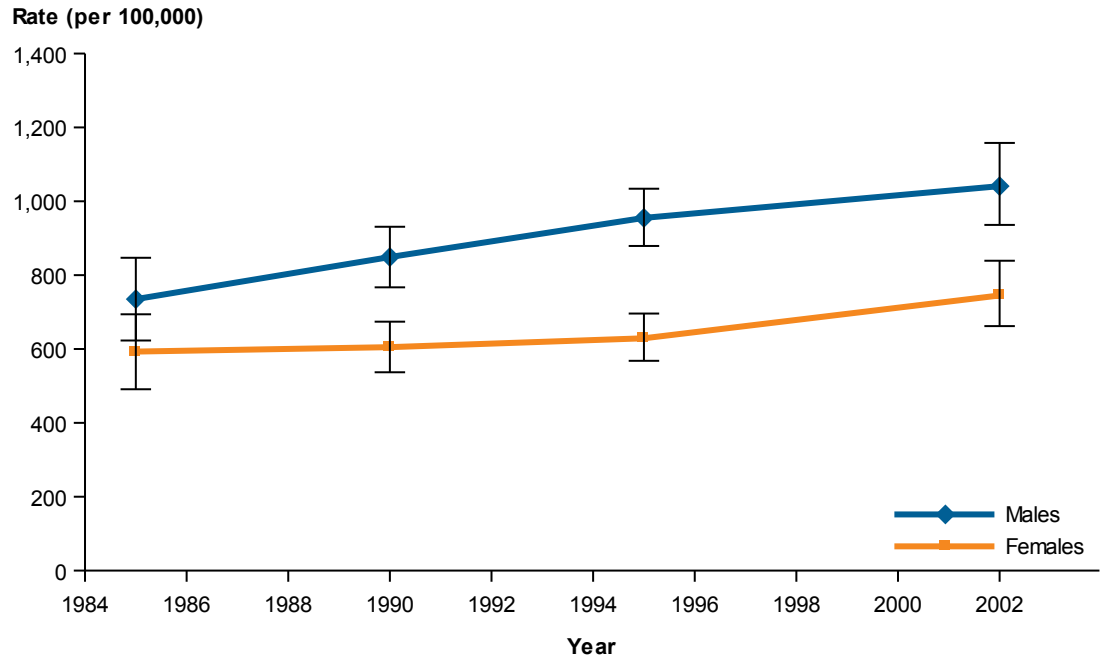
Basal cell carcinoma

In 2002:

- the age-standardised incidence rate for BCC was 884 cases per 100,000
- the rate was higher for males (1,041 cases per 100,000) than females (745 cases per 100,000).

From 1985 to 2002:

- the age-standardised incidence rate for BCC increased by 35% (from 657 cases per 100,000 to 884 cases per 100,000)
- the rate for males increased by 42% (from 735 cases per 100,000 to 1,041 cases per 100,000)
- the rate for females increased by 26% (from 593 cases per 100,000 to 745 cases per 100,000) (Figure 4.1).



Notes

1. Cancer coded in ICD-10 as C44.
2. The rates were age-standardised to the World Standard Population (Cancer incidence in five continents: a technical report 1966) and adjusted for failure of confirmation (NCCI 2003).
3. The data for this figure are in Table A8.

Source: AIHW analysis of age-specific rates reported in Staples et al. 2006; ABS population estimates.

Figure 4.1: Age-standardised incidence rate for basal cell carcinoma, by sex, 1985, 1990, 1995 and 2002

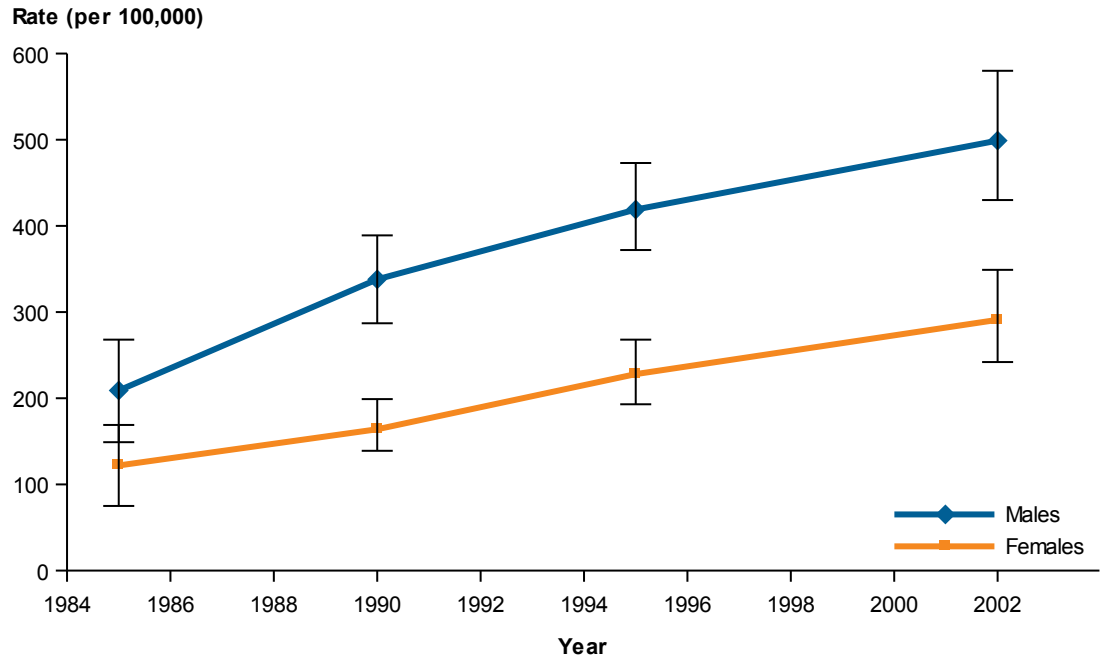
Squamous cell carcinoma

In 2002:

- the age-standardised incidence rate for SCC was 387 cases per 100,000
- the rate was higher for males (499 cases per 100,000) than females (291 cases per 100,000).

From 1985 to 2002:

- the age-standardised incidence rate for SCC more than doubled (from 166 cases per 100,000 to 387 cases per 100,000)
- the age-standardised incidence rate more than doubled for both males (from 209 cases per 100,000 to 499 cases per 100,000) and females (from 122 cases per 100,000 to 291 cases per 100,000) (Figure 4.2).



Notes

1. Cancer coded in ICD-10 as C44.
2. The rates were age-standardised to the World Standard Population (Cancer incidence in five continents: a technical report 1966) and adjusted for failure of confirmation (NCCI 2003).
3. The data for this figure are in Table A9.

Source: AIHW analysis of age-specific rates reported in Staples et al. 2006; ABS population estimates.

Figure 4.2: Age-standardised incidence rate for squamous cell carcinoma, by sex, 1985, 1990, 1995 and 2002

Rare non-melanoma skin cancers

Rare NMSCs include all NMSCs other than BCCs and SCCs. They consist of skin cancers, including, but not limited to Merkel cell carcinoma and dermatofibrosarcoma (see Appendix B for full list of histology types). These are the two most commonly diagnosed NMSCs after BCC and SCC. In 2012, 307 Merkel cell carcinomas (36% of all rare NMSCs diagnosed), and 78 dermatofibrosarcoma were diagnosed (9.1% of all rare NMSCs).

National incidence data for rare NMSCs are considered complete from 2001 onwards, so trend data in this section are presented from then.

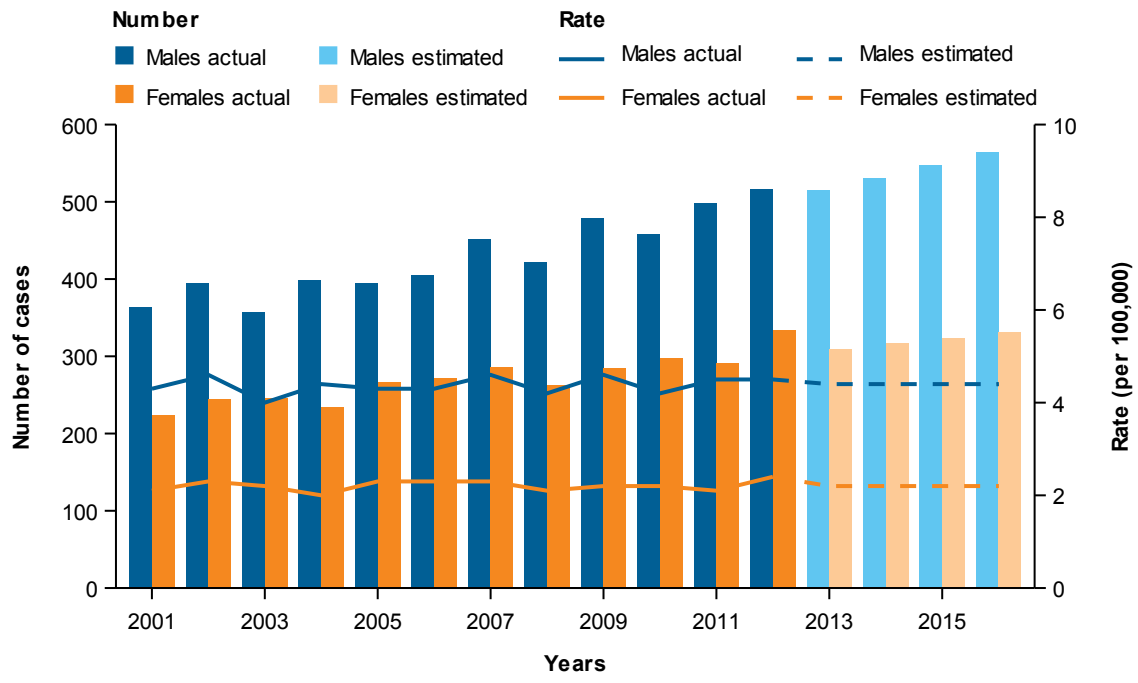
Sex

In 2016, it is estimated that:

- about 900 new cases of rare NMSC will be diagnosed in Australia, accounting for 0.7% of all cancers diagnosed (excluding BCCs and SCCs)
- males will have a higher proportion of rare NMSCs diagnosed (560) than females (330) (63% compared with 37%)
- the age-standardised incidence rate will be 3.2 cases per 100,000—4.4 cases per 100,000 males, and 2.2 cases per 100,000 females.

From 2001 to 2016:

- the total number of rare NMSCs diagnosed increased by 53% (from 587 cases to an estimated 900 cases)
- the number of rare NMSCs diagnosed increased by 54% for males (from 363 to an estimated 560), and by 47% for females (from 224 to an estimated 330)
- the age-standardised incidence rate for rare NMSCs remained relatively stable for both males and females (Figure 4.3).



Notes

1. Cancer coded in ICD-10 as C44, excluding BCC and SCC.
2. The rates were age-standardised to the estimated population of Australia for 30 June 2001, and are expressed per 100,000 population.
3. The data for this figure are in Table A1.

Source: ACD 2012.

Figure 4.3: Trends in the number of new cases diagnosed and incidence rate for rare NMSC, by sex, 2001–2012 (actual data) and 2013–2016 (estimated data)

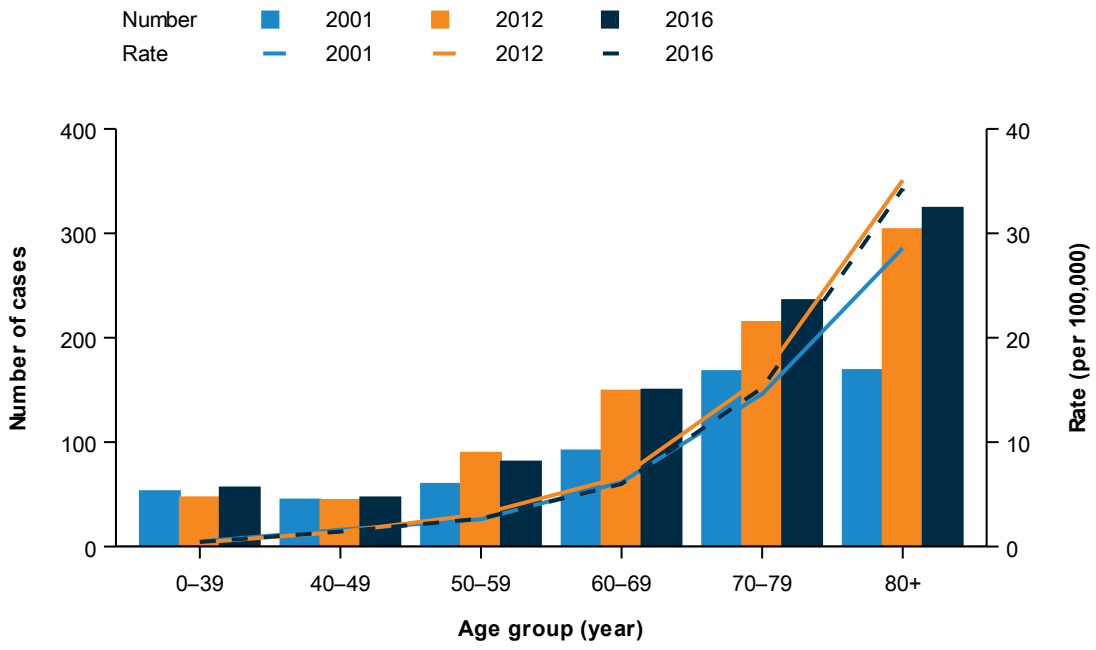
Age group

In 2016, it is estimated that:

- people aged 80 and over will account for the highest number of NMSC cases diagnosed (324 or 36%) and the highest age-specific incidence rate (34 cases per 100,000)
- people aged 0–39 will account for the lowest age-specific incidence rate (0.4 cases per 100,000).

From 2001 to 2016:

- the number of rare NMSC cases diagnosed increased for each age group
- the age-specific incidence rate increased for people aged 50–59, 70–79 and 80 and over, but dropped slightly for those aged 0–39, 40–49 and 60–69 (Figure 4.4).



Notes

1. Cancer coded in ICD-10 as C44, excluding BCC and SCC.
2. The rates were age-specific, and are expressed per 100,000 population.
3. The data for this figure are in Table A10.

Source: ACD 2012.

Figure 4.4: Number of cases and age-specific incidence rates for rare NMSC, by age group, 2001, 2012 (all actual data) and 2016 (estimated data)

Hospitalisations

In this section of the report, NMSC-related hospitalisations are defined as those where:

- the principal diagnosis (the diagnosis established after study to be chiefly responsible for the episode of admitted patient care) is a NMSC, or
- the additional diagnosis (a condition or complaint that either coexists with the principal diagnosis or arises during the episode of care and affects patient management) is a NMSC.

In this section, hospitalisations for NMSC include all NMSC combined. Due to data limitations it is not possible to separate the specific types of NMSC. For more information on hospitalisations data, see Appendix D and F.

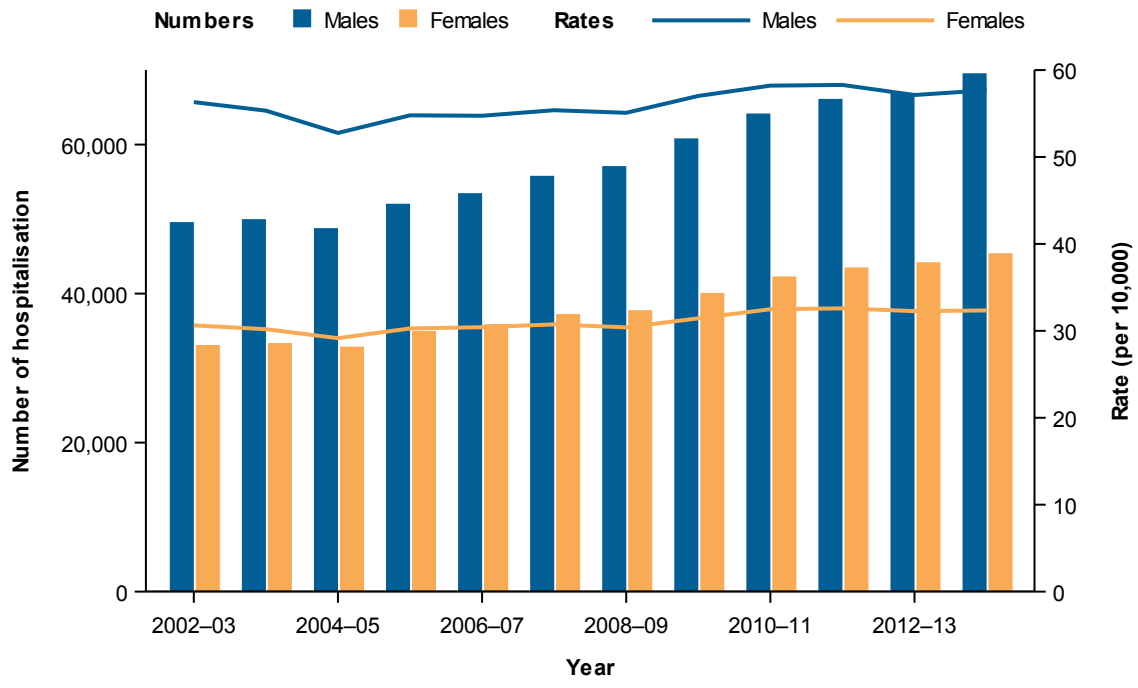
Number of hospitalisations and hospital rate

In 2013–14:

- there were 114,722 NMSC-related hospitalisations, 102,832 of which had a principal diagnosis of NMSC
- males accounted for a much higher proportion of NMSC-related hospitalisations (61% or 69,436) than females (40% or 45,286)
- the age-standardised hospitalisation rate for NMSC was 44 hospitalisations per 10,000
- the hospitalisation rate was higher for males (58 per 10,000) than females (32 per 10,000).

From 2002–03 to 2013–14:

- the number of NMSC-related hospitalisations increased by 39% (from 82,431 to 114,722)
- the number increased by 40% for males (from 49,464 to 69,436) and by 37% for females (from 32,967 to 45,286)
- the age-standardised NMSC-related hospitalisation rate for males fluctuated between 53 per 10,000 to 58 per 10,000
- the age-standardised hospitalisation rate for females fluctuated between 29 per 10,000 to 32 per 10,000 (Figure 4.5).



Notes

1. Hospitalisation for which the care type was reported as 'Newborn with no qualified days' and records for 'Hospital boarders' and 'Posthumous organ procurement' have been excluded from the analysis.
2. Hospitalisations in which the principal diagnosis was NMSC (ICD-10-AM code C44).
3. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 10,000 population.
4. The data for this figure are in Table A3b.

Source: AIHW National Hospital Morbidity Database.

Figure 4.5: Trends in the number of hospitalisations and hospitalisation rates for NMSC, by sex, 2002–03 to 2013–14

Treatment of NMSC

Treatment of NMSC varies, depending on the stage of the cancer, its location on the body, and the age and sex of the patient. Treatments may include surgery, chemotherapy and radiotherapy. In this section, data presented include surgery and chemotherapy.

Number of hospitalisations involving surgery

Treatment of NMSC involves two main types of surgical dermatological and plastic procedures: excision and repair. Excision involves the removal of a lesion of skin and subcutaneous tissue. Repair involves removing a section of undamaged skin, and transferring it to the site on the body where the excision occurred.

In 2013–14 there were:

- 250,011 dermatological and plastic procedures for NMSCs
- 180,168 excision procedures, representing 72% of all dermatological and plastic procedures
- 69,843 repair procedures, representing 28% of all dermatological and plastic procedures.

From 2002–03 to 2013–14:

- the number of NMSC-related dermatological and plastic procedures increased from 177,783 to 250,011, an overall rise of 41%
- the number of excision procedures increased from 133,574 to 180,168, a rise of 35%
- the number of repair procedures increased from 44,209 to 69,843, a rise of 58% (Table 4.1).

Table 4.1: Number and percentage of surgeries for NMSC, by surgery type, 2002–03 to 2013–14

	Excision surgery		Repair surgery	
Year	Number	%	Number	%
2002–03	133,574	75.1	44,209	24.9
2003–04	135,008	74.5	46,095	25.5
2004–05	130,207	74.4	44,907	25.6
2005–06	139,801	74.3	48,440	25.7
2006–07	143,254	74.4	49,350	25.6
2007–08	148,938	74.3	51,429	25.7
2008–09	128,815	71.5	51,380	28.5
2009–10	133,155	70.9	54,584	29.1
2010–11	127,926	69.0	57,341	31.0
2011–12	130,321	68.7	59,500	31.3
2012–13	141,464	68.3	65,697	31.7
2013–14	180,168	72.1	69,843	27.9

Notes

1. Hospitalisation for which the care type was reported as 'Newborn with no qualified days' and records for 'Hospital boarders' and 'Posthumous organ procurement' have been excluded from the analysis.
2. Number of surgeries where cancer-related hospitalisation was NMSC (ICD-10-AM code C44).
3. Percentages are of overall dermatological and plastic procedures.

Source: AIHW National Hospital Morbidity Database.

Chemotherapy

The number and rate of NMSC chemotherapy procedures in this report might be an under-count of actual procedures. This is because public hospitals in New South Wales, South Australia and the Australian Capital Territory provide same-day chemotherapy on a non-admitted basis, which means that information on these services are not collected in the NHMD.

In 2013–14, 1,582 NMSC-related chemotherapy procedures were performed, representing 0.6% of all NMSC-related hospitalisations.

From 2002–03 to 2013–14:

- the number of NMSC-related chemotherapy procedures increased by 65%, from 960 to 1,582
- the proportion of NMSC-related procedures involving chemotherapy dropped from 1.2% to 0.6%.

Mortality

While NMSC is the most commonly diagnosed cancer in Australia, it is often not life threatening. Mortality data in this section presents all NMSCs combined including BCCs, SCCs, and rare NMSCs, as it is not possible to break down these data into specific sub-types. The actual mortality data for NMSC are available for 1968–2013, and estimated data for 2014–2016.

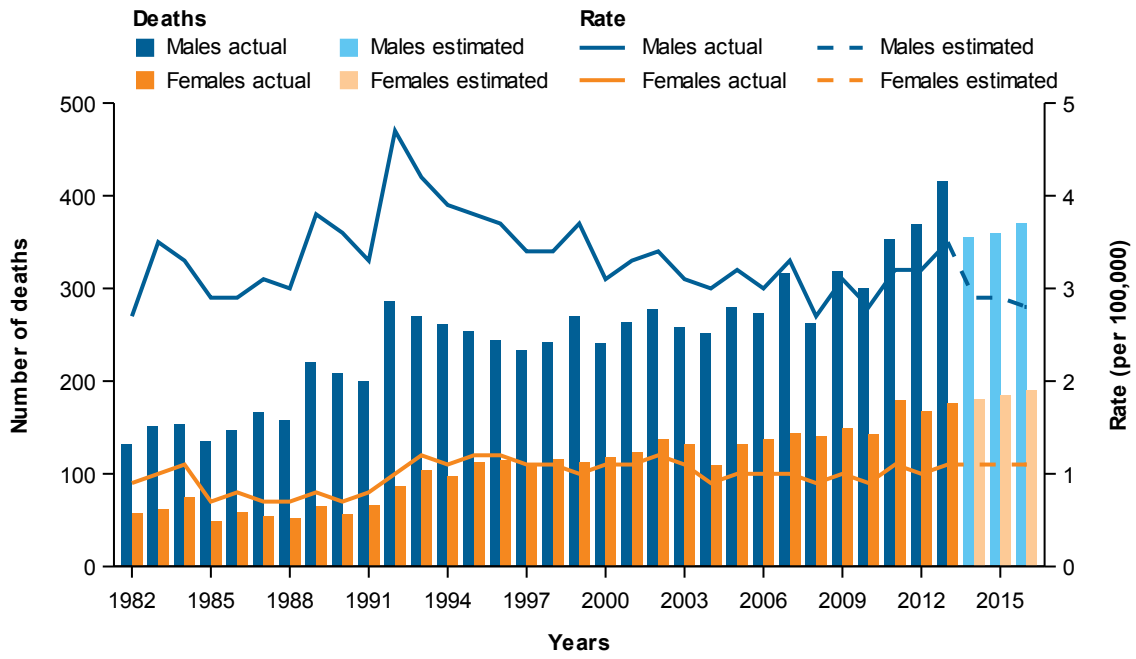
Sex

In 2016, it is estimated that:

- 560 people will die from NMSC, representing 1.2% of all deaths from cancer (46,880), with two-thirds (66% or 370) being male and one-third (34% or 190) being female
- the age-standardised mortality rate for NMSC will be 1.9 deaths per 100,000, with males having a higher age-standardised mortality rate (2.8 deaths per 100,000) than females (1.1 death per 100,000).

From 1982 to 2016:

- the number of deaths from NMSC increased from 189 to an estimated 560
- for males, the number increased from 132 to an estimated 370, and for females, from 57 to an estimated 190
- the age-standardised mortality rate for NMSC was relatively stable, and was consistent for both males and females (Figure 4.6).



Notes

1. Deaths registered in 2011 and earlier are based on the final version of death data; deaths registered in 2012 and 2013 are based on revised and preliminary versions, respectively, and are subject to further revision.
2. NMSC coded in ICD-10 as C44 (for 1997–2013) and in ICD-09 as 173 (for 1982–1996).
3. The rates were age-standardised to the Australian population as at 30 June 2001.
4. The 2014, 2015 and 2016 estimates are based on 2002–2013 mortality data.
5. Actual mortality data for 1982–2012 are based on the year of occurrence of the death, and data for 2013 are based on the year of registration of the death.
6. The data for this figure are in Table A6.

Source: AIHW National Mortality Database.

Figure 4.6: Trends in the number of deaths and mortality rates for NMSC, by sex, 1982–2013 (actual data) and 2014–2016 (estimated data)

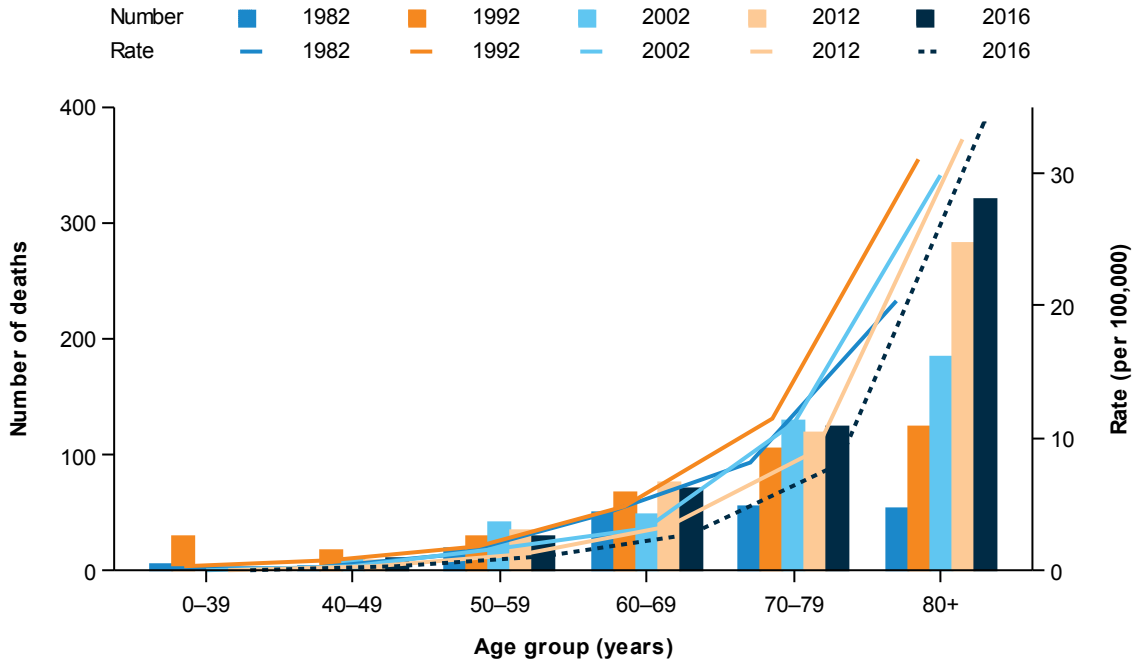
Age group

In 2016, it is estimated that:

- people aged 80 and over will account for the highest number of deaths from NMSC, at 320 (57% of all deaths from NMSC)
- the age-specific mortality rate for NMSC will be highest for those aged 80 and over, at 34 deaths per 100,000.

From 1982 to 2016:

- the age-specific mortality rate dropped slightly for people aged 0–39, 50–59, 60–69 and 70–79
- those aged 80 and over had the largest rate rise, at 67% (from 20 per 100,000 to an estimated 34 per 100,000) (Figure 4.7).



Notes

1. Deaths registered in 2011 and earlier are based on the final version of death data. Deaths registered in 2012 and 2013 are based on revised and preliminary versions, respectively, and are subject to further revision.
2. NMSC coded in ICD-10 as C44 (for 1997–2013) and in ICD-09 as 173 (for 1982–1996).
3. The rates were age-specific, and are expressed per 100,000 population.
4. The 2016 estimates are based on 2002–2013 mortality data.
5. Actual mortality data for 1982–2012 are based on the year of occurrence of the death, and data for 2013 are based on the year of registration of the death.
6. The data for this figure are in Table A11.

Source: AIHW National Mortality Database.

Figure 4.7: Number of deaths and age-specific mortality rates for NMSC, by age group, 1982, 1992, 2002, 2012 (all actual data) and 2016 (estimated data)

5 Focus on key population groups

This chapter presents cancer incidence and mortality data for:

- Aboriginal and Torres Strait Islander people
- state and territory of residence
- remoteness area of residence
- socioeconomic groups.

Data sources used to inform this chapter included the 2011 Australian Cancer Database (ACD) and the National Mortality Database (NMD). Due to limitations in the availability of incidence data for NMSC, data are only presented for melanoma. Data have been presented as a total for multiple years to reduce variations in rates.

Incidence data are presented as a total over 5 years (2005–2009) for Aboriginal and Torres Strait Islander people, states and territories and remoteness areas. Due to the lack of availability of some data for socioeconomic disadvantage, 4 years of data (2006–2009) are used.

Mortality data are presented as a total over 5 years (2008–2012) for Aboriginal and Torres Strait Islander people, states and territories and remoteness areas. To be consistent with the incidence data, mortality data for socioeconomic group are also presented as a total for 4 years (2009–2012).

Aboriginal and Torres Strait Islander people

Incidence data from the ACD on Indigenous status are only considered to be of sufficient quality for use for four jurisdictions: New South Wales, Queensland, Western Australia and the Northern Territory.

Mortality data from the NMD on Indigenous status are considered to be of sufficient quality for use for five jurisdictions: New South Wales, Queensland, Western Australia, South Australia and the Northern Territory.

Incidence

Due to the high level of skin pigment, Indigenous Australians have a lower risk of being diagnosed with melanoma than non-Indigenous Australians (Gloster Jr & Neal 2006).

In 2005–2009:

- 84 cases of melanoma diagnosed in Indigenous Australians, representing 0.2% of all melanomas diagnosed over this period
- the age-standardised incidence rate for melanoma in Indigenous Australians was 9.3 cases per 100,000, compared with 33 cases per 100,000 for non-Indigenous Australians (Indigenous status was not stated in about 40% of cases) (Table 5.1).

Table 5.1: Number of new cases diagnosed and incidence rates for melanoma, by Indigenous status, 2005–2009

Indigenous status	Number	ASR (per 100,000)
Aboriginal and Torres Strait Islander	84	9.3
Non-Indigenous	22,328	33.0
Not stated	14,906	. .
Total	**37,318**	**54.3**

. . not applicable.

Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the estimated population of Australia for 30 June 2001, and are expressed per 100,000 population.

Source: ACD 2011.

Mortality

In 2008–2012:

- 22 Indigenous Australians died from melanoma, representing 0.4% of all deaths from melanoma over this period
- the age-standardised mortality rate for melanoma in Indigenous Australians was 2.3 deaths per 100,000, compared with 6.4 per 100,000 for non-Indigenous Australians (Indigenous status was not determined in about 0.9% of deaths from melanoma) (Table 5.2).

Table 5.2: Number of deaths and mortality rates for melanoma, by Indigenous status, 2008–2012

Indigenous status	Number	ASR (per 100,000)
Indigenous	22	2.3
Non-Indigenous	5,405	6.4
Not stated	51	. .
Total	**5,478**	**6.4**

. . not applicable.

Notes

1. Deaths registered in 2009 and earlier are based on the final version of death data. Deaths registered in 2010 and 2011 are based on revised and preliminary versions, respectively, and are subject to further revision by the ABS. These data have not been adjusted for the additional deaths arising from outstanding registrations of deaths in Queensland in 2010. For more detail, refer to Technical note 3 in *Causes of death, Australia, 2010* (ABS 2010).
2. Cancer coded in ICD-10 as C43.
3. The rates were age-standardised to the Australia population as at 30 June 2001, and are expressed per 100,000 population.
4. Mortality data for 2008–2011 are based on the year of occurrence of the death, and data for 2012 are based on the year of registration of the death.

Source: AIHW National Mortality Database.

States and territories

Incidence

Due to its land area, Australia covers multiple climate zones. The risk of skin cancer is higher in tropical and subtropical areas due to higher levels of ambient UV radiation from the sun (ACRF 2005).

In 2005–2009:

- the number of cases of melanoma diagnosed ranged from 249 in the Northern Territory to 17,986 cases in New South Wales, with the variation largely due to the size of the population in each jurisdiction
- Queensland had the highest age-standardised incidence rate (67 cases per 100,000), and the Northern Territory had the lowest (32 per 100,000). The lower incidence rate in the Northern Territory might be partly due to its high proportion of Indigenous residents (Table 5.3).

Table 5.3: Number of new cases diagnosed and incidence rates for melanoma, by state or territory, 2005–2009

State or territory	Number	ASR (per 100,000)
New South Wales	17,986	49.0
Victoria	11,259	41.2
Queensland	13,882	66.7
Western Australia	5,201	49.1
South Australia	3,381	37.9
Tasmania	1,346	48.9
Australian Capital Territory	672	42.3
Northern Territory	249	32.3
Total	**53,976**	**49.3**

Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.

Source: ACD 2011.

Mortality

In 2008–2012:

- the number of deaths from melanoma ranged from 25 in the Northern Territory to 2,545 in New South Wales, with the variation largely due to the size of the population in each jurisdiction
- Queensland had the highest age-standardised mortality rate (7.5 deaths per 100,000), and the Northern Territory had the lowest (3.1 per 100,000). The lower mortality rate in the Northern Territory might be partly due to its high proportion of Indigenous residents (Table 5.4).

Table 5.4: Number of deaths and mortality rates for melanoma, by state and territory, 2008–2012

State or territory	Number	ASR (per 100,000)
New South Wales	2,545	6.3
Victoria	1,539	5.1
Queensland	1,694	7.5
Western Australia	703	6.2
South Australia	511	5.0
Tasmania	188	5.9
Australian Capital Territory	95	5.9
Northern Territory	25	3.1
Total	**7,300**	**6.1**

Notes

1. Deaths registered in 2009 and earlier are based on the final version of death data. Deaths registered in 2010 and 2011 are based on revised and preliminary versions, respectively, and are subject to further revision by the ABS. These data have not been adjusted for the additional deaths arising from outstanding registrations of deaths in Queensland in 2010. For more detail, refer to Technical note 3 in *Causes of death, Australia, 2010* (ABS 2010).
2. Cancer coded in ICD-10 as C43.
3. The rates were age-standardised to the Australia population as at 30 June 2001, and are expressed per 100,000 population.
4. Mortality data for 2008–2011 are based on the year of occurrence of the death, and data for 2012 are based on the year of registration of the death.

Source: AIHW National Mortality Database.

Remoteness area

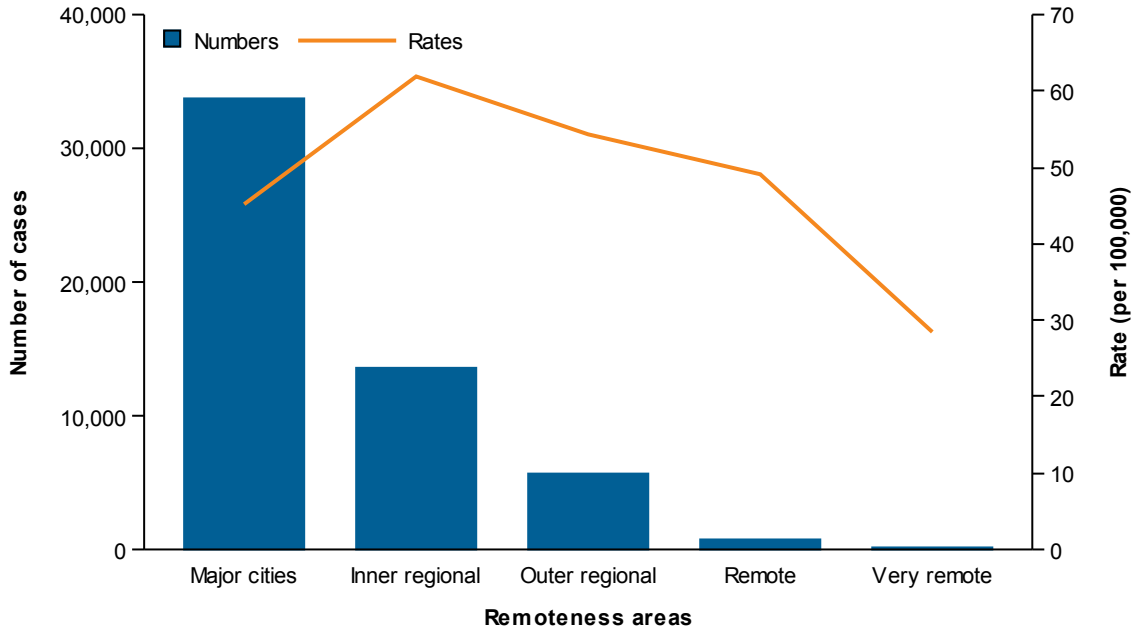
Incidence and mortality rates were calculated according to the remoteness area of residence at diagnosis or death. This section uses the Australian Bureau of Statistics (ABS) Remoteness Area classification, which allocates 1 of 5 categories to areas, depending on their distance from urban centres, where the population of the urban centre is considered to influence the services available.

Incidence and mortality rates are presented by five categories: *Major cities*, *Inner regional*, *Outer regional*, *Remote* and *Very remote*.

Incidence numbers for remoteness areas sum to less than the total for Australia, as some records have an unknown Statistical Local Area (See Glossary).

Incidence

In 2005–2009, the incidence rate of melanoma decreased by remoteness area—from 45 per 100,000 for people living in *Major cities* to 29 per 100,000 for people living in *Very remote* areas. Lower incidence rates of melanoma in remote and very remote areas might be partly due to the relatively high proportion of Indigenous people living in these areas. The risk of developing melanoma in people with darker skin is lower (Gloster Jr & Neal 2006).



Notes

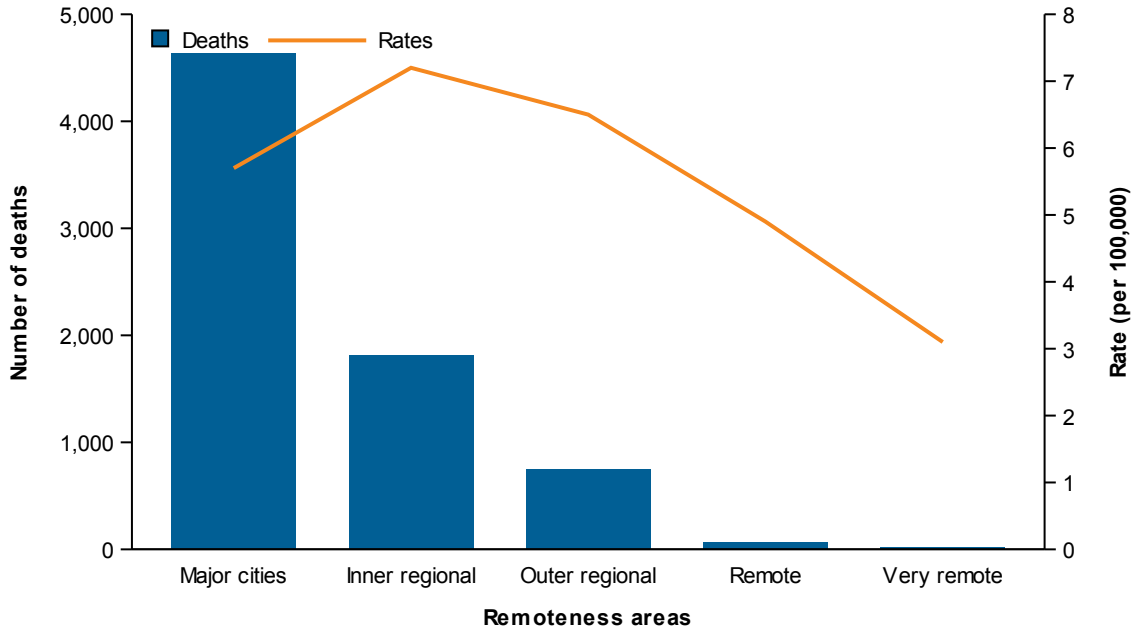
1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Remoteness was classified according to the Australian Standard Geographical Classification Remoteness Areas.
4. The data for this figure are in Table A12.

Source: ACD 2011.

Figure 5.1: Number of cases and incidence rate for melanoma, by remoteness area, 2005–2009

Mortality

In 2008–2012, *Inner regional* areas had the highest mortality rates (7.2 per 100,000), while *Very remote* areas had the lowest (3.1 per 100,000).



Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Deaths registered in 2010 and earlier are based on the final version of cause of death data. Deaths registered in 2011 and 2012 are based on revised and preliminary versions, respectively, and are subject to further revision by the ABS.
4. Remoteness was classified according to the Australian Standard Geographical Classification Remoteness Areas.
5. Mortality data for 2008–2011 are based on the year of occurrence of the death, and data for 2012 are based on the year of registration of the death.
6. The data for this figure are in Table A13.

Source: AIHW National Mortality Database.

Figure 5.2: Number of deaths and mortality rates for melanoma, by remoteness area, 2008–2012

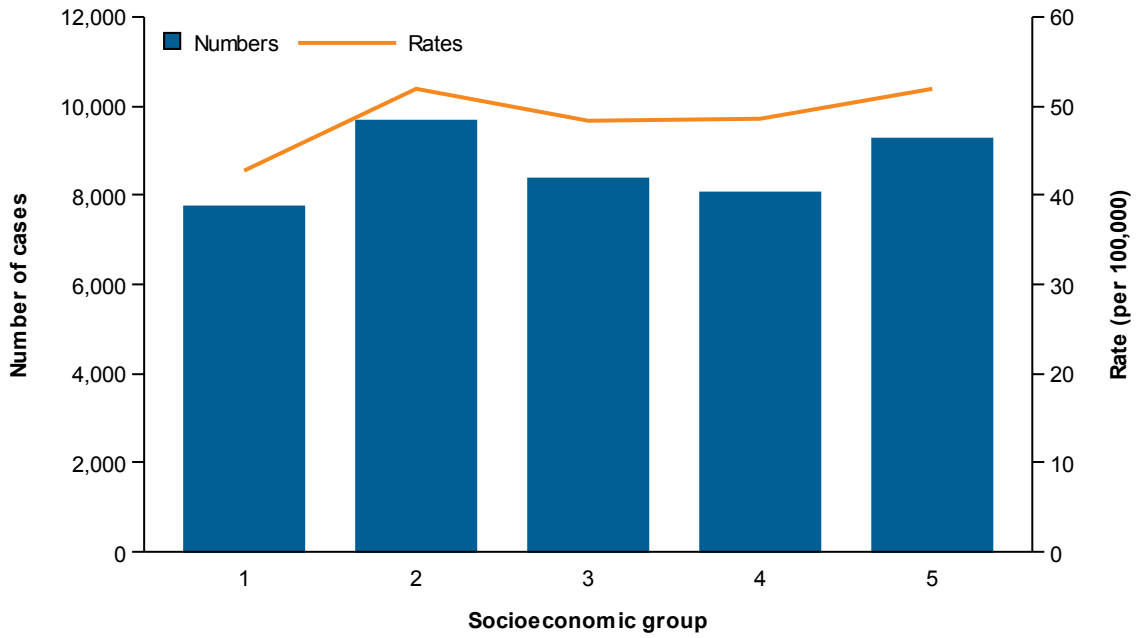
Socioeconomic groups

In this report, the lowest socioeconomic group corresponds to the 20% of the population living in geographical areas with the lowest socioeconomic characteristics according to the Index of Relative Socio-economic Disadvantage, and the highest socioeconomic group corresponds to the 20% of the population living in the areas with the highest socioeconomic characteristics. Due to the variations in the number of melanomas diagnosed across years, 4 years of data (2006–2009) have been combined across each group.

Incidence numbers across socioeconomic groups sum to less than the total for Australia, because some records have an unknown Statistical Local Area (see Glossary).

Incidence

In 2005–2009, there was no clear correlation between the incidence rate of melanoma and socioeconomic group, although some overseas studies do show strong co-correlations (MacKie & Hole 1996).



Notes

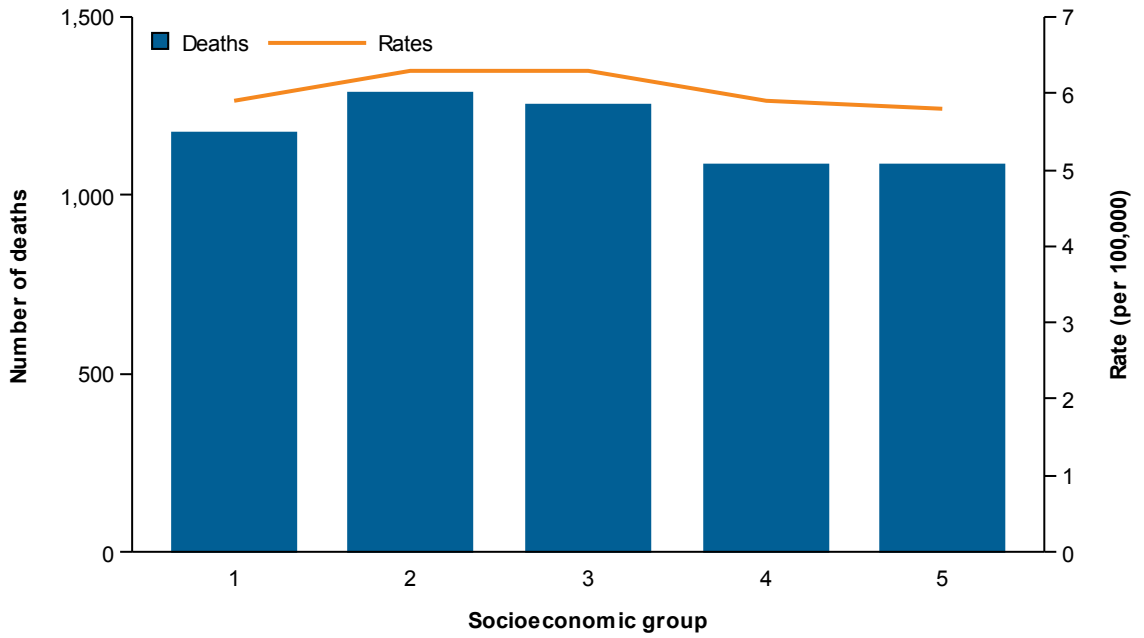
1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Socioeconomic disadvantage was classified using the ABS Index of Relative Socio-economic Disadvantage, where 1 represents the lowest socioeconomic group and 5 represents the highest socioeconomic group.
4. The data for this figure are in Table A14.

Source: ACD 2011.

Figure 5.3: Number of cases and incidence rate for melanoma, by socioeconomic group, 2005–2009

Mortality

In 2009–2012, the mortality rate for melanoma was highest in the second and third lowest socioeconomic groups (6.3 per 100,000), and lowest in the highest socioeconomic group (5.8 per 100,000).



Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Socioeconomic disadvantage was classified using the ABS Index of Relative Socio-economic Disadvantage, where 1 represents the lowest socioeconomic group and 5 represents the highest socioeconomic group.
4. Deaths registered in 2010 and earlier are based on the final version of cause of death data. Deaths registered in 2011 and 2012 are based on revised and preliminary versions, respectively, and are subject to further revision by the ABS.
5. Mortality data for 2008–2011 are based on the year of occurrence of the death, and data for 2012 are based on the year of registration of the death.
6. The data for this figure are in Table A15.

Source: AIHW National Mortality Database.

Figure 5.4: Number of deaths and mortality rate for melanoma, by socioeconomic group, 2009–2012

6 Medicare subsidised services

This section presents information on the number of Medicare claims paid for melanoma and NMSC (BCC and SCC combined only). The numbers presented include services performed by a registered provider in 2014, which qualified for a Medicare benefit, and has been processed and paid for by the Department of Human Services. They do not include services provided by hospital doctors to public patients in public hospitals or services that qualify for a benefit under the Department of Veterans' Affairs National Treatment Account.

Data were sourced from the Department of Human Services for all item numbers that relate to the treatment of melanoma and NMSC that included excision, laser, curettage or liquid nitrogen therapy and were sent for histological examination (DHS 2014) (See Appendix C).

There is some overlap between the Medicare and the NHMD data presented in this report (such as, admitted patient services for 'private' patients that may be billed to Medicare). As such, Medicare data presented in this report should be treated as independent information, and should not be added to, or compared with, NHMD data.

Melanoma

Medicare subsidised services

In 2014, there were 40,179 paid Medicare services related to melanoma. Males accounted for a higher proportion (23,774 or 59%) than females (16,405 or 41%).

Queensland had a high proportion of the total paid Medicare services related to melanoma (30%) relative to the proportion of Australia's population living in Queensland (20%). People living in tropical and subtropical areas are at higher risk of skin cancer, due to higher levels of ambient UV radiation from the sun (ACRF 2005) (Table 6.1).

Table 6.1: Number of Medicare benefits services paid for melanoma, by state or territory and sex, 2014

State or territory	Males	Females	Total	%	State/territory population %
NSW	7,809	5,195	13,004	32.4	32.0
Vic	4,052	3,083	7,135	17.8	24.9
Qld	7,263	4,889	12,152	30.2	20.1
WA	2,662	1,757	4,419	11.0	10.9
SA	1,240	853	2,093	5.2	7.2
Tas	387	359	746	1.9	2.2
ACT	222	192	414	1.0	1.6
NT	139	77	216	0.5	1.0
Australia	**23,774**	**16,405**	**40,179**	**100.0**	**100.0**

Notes

1. The figures in the report include only services performed by a registered provider, which qualified for Medicare Benefit, and for which a claim has been processed by Medicare Australia. They do not include services provided by hospital doctors to public patients in public hospitals or services that qualify for a benefit under the Department of Veterans' Affairs National Treatment Account.
2. Per cent is presented for the total level only.
3. State or territory population is the percentage relative to the whole of Australia.

Source: DHS 2014.

Medicare spending

In 2014, nearly $9.4 million of Medicare benefits were paid for services related to melanoma. Males accounted for a higher proportion ($5.6 million or 59%) than females ($3.8 million or 41%).

Queensland had a high proportion of paid Medicare services related to melanoma (30%) relative to the proportion of Australia's population living in Queensland (20%) (Table 6.2).

Table 6.2: Amount ($) of Medicare benefits services paid for melanoma, by state or territory and sex, 2014

State	Males	Females	Total	%	State/territory population %
NSW	1,869,994	1,246,964	3,116,858	33.2	32.0
Vic	916,786	703,963	1,620,749	17.3	24.9
Qld	1,686,065	1,119,832	2,805,897	29.9	20.1
WA	645,161	425,661	1,070,821	11.4	10.9
SA	266,915	184,618	451,532	4.8	7.2
Tas	91,468	85,202	176,669	1.9	2.2
ACT	50,211	41,574	91,784	1.0	1.6
NT	30,981	17,054	48,034	0.5	1.0
Australia	**5,557,581**	**4,934,933**	**9,382,344**	**100.0**	**100.0**

Notes

1. Amounts of males and females do not add to the total, due to rounding.
2. Per cent is presented for the total level only.
3. State or territory population is the percentage relative to the whole of Australia.

Source: DHS 2014.

Non-melanoma skin cancers

Medicare subsidised services

In 2014, there were 959,243 paid Medicare services related to NMSC. Males accounted for a much higher proportion (600,482 or 63%) than females (358,761 or 37%).

Queensland had a high proportion of paid Medicare services related to NMSC (36%) relative to the proportion of Australia's population living in Queensland (20%). People living in tropical and subtropical areas are at higher risk of skin cancer due to higher levels of ambient UV radiation from the sun (ACRF 2005) (Table 6.3).

Table 6.3: Number of Medicare benefits services paid for NMSC, by state or territory and sex, 2014

State	Males	Females	Total	%	State/territory population %
NSW	210,354	123,444	333,798	34.8	32.0
Vic	79,962	51,077	131,039	13.7	24.9
Qld	215,412	128,204	343,616	35.8	20.1
WA	52,483	30,668	83,151	8.7	10.9
SA	25,392	15,115	40,507	4.2	7.2
Tas	8,456	5,547	14,003	1.5	2.2
ACT	4,888	3,061	7,949	0.8	1.6
NT	3,535	1,645	5,180	0.5	1.0
Australia	**600,482**	**358,761**	**959,243**	**100**	**100**

Notes

1. The figures in the report include only services performed by a registered provider, which qualified for Medicare Benefit, and for which a claim has been processed by Medicare Australia. They do not include services provided by hospital doctors to public patients in public hospitals or services that qualify for a benefit under the Department of Veterans' Affairs National Treatment Account.
2. Per cent is presented for the total level only.
3. State or territory population is the percentage relative to the whole of Australia.

Source: DHS 2014.

Medicare spending

In 2014, nearly $127.6 million of NMSC-related Medicare benefits were paid. Males accounted for a much higher proportion ($79.3 million or 62%) than females ($48.3 million or 38%).

Queensland had a high proportion of paid Medicare services related to NMSC (34%) relative to the proportion of Australia's population living in Queensland (20%) (Table 6.4).

Table 6.4: Amount ($) of Medicare benefits services paid for NMSC, by state or territory and sex, 2014

State	Males	Females	Total	%	State/territory population %
NSW	27,808,843	16,559,169	44,368,010	34.8	32.0
Vic	10,883,251	7,022,825	17,906,076	14.0	24.9
Qld	27,287,006	16,539,399	43,826,407	34.4	20.1
WA	7,552,359	4,605,508	12,157,864	9.5	10.9
SA	3,449,896	2,088,695	5,538,592	4.3	7.2
Tas	1,162,307	766,919	1,929,224	1.5	2.2
ACT	691,036	453,768	1,144,811	0.9	1.6
NT	468,199	228,764	696,962	0.5	1.0
Australia	**79,302,897**	**48,265,047**	**127,567,946**	**100.0**	**100.0**

Notes

1. Amounts of males and females do not add to the total, due to rounding.
2. Per cent is presented for the total level only.
3. State or territory population is the percentage relative to the whole of Australia.

Source: DHS 2014.

7 Spotlight on limitations of NMSC data

Common NMSCs, including basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are the most commonly diagnosed cancers in Australia. In one year, the number of BCCs and SCCs diagnosed is more than all other cancers combined. In 2008–09, NMSC accounted for 8.1% of all health system spending on cancer in Australia (excluding population health screening programs) (AIHW 2013). Data on BCC and SCC are not available by all state and territory cancer registries, as legislation does not mandate collection (that is, they are not notifiable diseases).

Available data sources and their limitations

Surveys

The main source of NMSC data currently available is the periodic national non-melanoma skin cancer population surveys, which were conducted in 1998, 1990, 1995 and 2002. The surveys were conducted face-to-face to identify people who had been diagnosed with NMSC and the diagnosis was confirmed with the health provider. The numbers and incidence rates from these surveys were based on people who had been treated for medically diagnosed NMSC in the previous 12 months (Staples et al. 2006). These surveys show an increase in the overall numbers of BCCs and SCCs diagnosed, though not consistently across all age groups. The main limitations of these data in relation to NMSC reporting are that:

- the last survey was conducted in 2002, and there might have been substantial changes in NMSC incidence since then
- the coverage, completeness and granularity of the data are limited.

Hospitals data

The NHMD collects the number of episodes of treatment for NMSCs. This collection includes NMSC as principal diagnosis, additional diagnosis, and the procedures related to the treatment, including chemotherapy and radiotherapy. The main limitations of using these data in relation to NMSC reporting are that:

- the NHMD is a collection of admitted patient episode-level records, so cannot directly provide information on incidence—a diagnosis of a cancer does not necessarily entail any presentation to hospital, and there is no clear means of defining what a 'new' cancer diagnosis is in general, or the point at which that diagnosis was made (these matters would remain even if multiple episodes were linked for individuals)
- ICD-10-AM does not distinguish between common and rare NMSCs, so the hospital data cannot be reported separately for BCC, SCC and rare NMSC.

Medicare data

The Medicare data provide information on Medicare services and spending for the treatment of NMSCs. These data can be used to estimate aspects of the treatment burden of NMSC, and include services where the malignancy was confirmed by histopathology or specialist. The key limitations of using Medicare data to estimate NMSC incidence are that:

- the data do not include instances where a NMSC has been removed (such as by cryotherapy) but was not confirmed pathologically
- the data are not able to be reported separately for BCC, SCC and rare NMSC
- data where services were provided to public patients in public hospital are not available.

Parliamentary inquiry into non-melanoma skin cancer

The House of Representatives Standing Committee on Health conducted an inquiry into skin cancer in Australia in March 2014. The AIHW submitted a paper that included the latest available data and statistics on skin cancer, and made a recommendation to consider collecting regular national data on the incidence of NMSC in Australia.

The submission provided a summary of skin cancer in Australia, and highlighted the current gaps in data collection—particularly for NMSC. Recommendations emphasised the importance of collecting national data on the incidence of NMSC at regular intervals, to help establish and assess the effectiveness of public awareness programs such as SunSmart.

Four potential models to collect and report on common NMSC in Australia were presented:

1. Include common NMSC as a notifiable cancer in each state and territory, and collect complete data through cancer registries.
2. Include common NMSC as a notifiable cancer in selected regions of Australia, and collect complete data for these regions through cancer registries.
3. Collect information through regular national surveys every 5 years.
4. Investigate the utility of other available data for producing NMSC incidence estimates that are fit for purpose.

Option 1: Include common NMSC as a notifiable cancer in each state and territory, and collect complete data through cancer registries

Including common NMSC as a notifiable cancer would provide highly accurate and ongoing annual information on the incidence of common NMSC in Australia. However, with more than 3.5 times as many cases of common NMSC as all other cancer cases combined, state and territory cancer registries would need greater resources and capacity to cope with the increased number of notifications. As NMSC is predominantly a disease associated with old age, an ageing population could lead to an increase in NMSC numbers (Fransen et al. 2012). Further, unlike most cancers, NMSCs can be diagnosed in a single person multiple times and/or at multiple locations at the same time (Raasch & Buettner 2002).

Not all suspected NMSCs are pathologically confirmed. Often suspicious looking growths are treated with excision, cryotherapy, electrodesiccation or cautery with no pathology confirmation. Therefore, more samples would need to be sent to pathology laboratories, increasing their workload and associated costs. Many common NMSCs are treated by GPs and dermatologists who are currently not legally required to notify cancer registries of cancer diagnoses. Legislation would need to be changed to make them notifiers of common NMSC.

While including common NMSC as a notifiable cancer would provide the highest quality data possible, the costs and issues might outweigh the benefits. If additional resourcing were

available, the collection of NMSC incidence data through cancer registries would need to be prioritised against other data needs, such as the collection of stage of cancer at diagnosis.

Tasmania collected all NMSCs diagnosed from the time their cancer register was established in 1982 until 2005, when it became clear did not have enough resources to continue to register common NMSCs.

Option 2: Include common NMSC as a notifiable cancer in selected regions of Australia and collect complete data for these regions through cancer registries

While this option would involve lower overall costs than Option 1, the same issues would need to be considered, though on a smaller scale.

The quality of data provided through this model would not be as high as that from Option 1, because it would only be a subset of data, but careful selection of the regions would make sure the results represent the whole of Australia. Periodic monitoring of the demographics and characteristics of the regions might be needed to ensure they remained representative, which would result in additional costs.

While including common NMSC as a notifiable cancer in regions would provide high-quality data, the costs and issues might outweigh the benefits. If additional resourcing were available, the collection of NMSC incidence data through cancer registries for regions would need to be prioritised against other data needs.

Option 3: Collect information through regular national surveys approximately every 5 years

Collecting information on the incidence of common NMSC through regular national surveys would: update information on incidence; enable the monitoring of trends in incidence rates in different sectors of the community (for example, by sex, age group and region); and would enable better incidence estimates to be made for the years between surveys.

Potentially, a national survey could also help to assess, and increase, the level of awareness of skin cancer in the Australian community, as well as identify effective strategies for prevention and for increasing public awareness.

While not insignificant, the cost of collecting information on common NMSC through regular national surveys is likely to be lower than Option 2, and much lower than Option 1.

While the quality of data on the incidence of common NMSC collected through a national survey would provide improved data, the incidence estimates would be subject to sampling error, which might limit the extent to which results could be generalised to the Australian population, particularly for smaller population groups.

One major benefit of a national survey is that, as well as collecting data on the incidence of common NMSC, it could also collect other high-priority information on skin cancer (such as information on public awareness and prevention). A survey would also provide opportunities to increase public awareness of skin cancer.

Option 4: Investigate the utility of other available data for producing NMSC incidence estimates that are fit for purpose

Other currently available data might be used to produce regular estimates of the incidence of common NMSC in Australia. For example, it might be possible to use Medicare Australia data to produce regular estimates of the incidence of skin cancer. Further investigations

could reveal that the use of data linkage to bring together two or more existing data sources could be beneficial in estimating common NMSC incidence.

The first step could be a feasibility study. If using existing data sources to produce regular estimates of common NMSC incidence proves to be feasible, this option is likely to involve the lowest overall cost. But the resulting data might have some limitations. As these data sources are not specifically designed for the purpose of measuring the incidence of common NMSC, what can be estimated and the accuracy of estimates produced could be limited.

Potential data sources

Medicare data can be used to produce information on services for NMSC that are covered by the Medicare Benefits Scheme. Some of these data have been analysed and presented in this report. It might also be possible to use these data, with other data sources, to provide some indication of the incidence and prevalence of NMSC in Australia, but this is likely to have some limitations. Further scoping work would be needed to explore the feasibility and limitations of using Medicare Benefits Scheme data for this purpose.

Another potential source of data could be the 45 and Up survey, which includes a baseline question on NMSC. This survey can provide limited data on a specific age group, but could not give accurate information on overall NMSC in the Australian population. This is due to the limited survey sample population of people aged 45 or over living in New South Wales.

The QSkin study, done by the Bergofer Medical Research Institute, could also be a possible data source. This study of almost 44,000 Queenslanders has been done to understand how skin cancers develop, as Queensland has one of the highest rates of skin cancers in the world.

As these existing data sources are not specifically designed to measure the incidence of common NMSC in Australia, there are likely to be limitations.

But while improving the data available for NMSCs in Australia poses considerable challenges, it is important to explore what might be possible because NMSCs place a significant burden on Australia's health system. An incremental approach could be taken to reporting and data development on NMSCs.

Appendix A: Tables

Table A1: Number of new cases diagnosed and incidence rates for melanoma, by sex, 1982–2016, and rare non-melanoma skin cancers, by sex, 2001–2016

	Melanoma						Rare NMSC					
	Number of new cases			Rate (per 100,000)			Number of new cases			Rate (per 100,000)		
Year	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
1982	1,733	1,793	3,526	27.9	26.1	26.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1983	1,816	1,970	3,786	28.7	28.0	27.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1984	1,990	2,047	4,037	31.2	28.7	29.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1985	2,219	2,280	4,499	33.8	31.3	32	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1986	2,404	2,308	4,712	35.6	31.1	32.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	2,870	2,676	5,546	41.1	35.1	37.7	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1988	3,190	2,814	6,004	45.6	36.1	40.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1989	3,112	2,609	5,721	43.8	32.8	37.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	3,136	2,674	5,810	43.6	33.0	37.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1991	3,181	2,775	5,956	43.2	33.6	37.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1992	3,583	2,983	6,566	47.7	35.4	40.7	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1993	3,709	3,054	6,763	48.8	35.6	41.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1994	3,825	3,112	6,937	49.3	35.7	41.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1995	4,148	3,314	7,462	52.3	37.2	43.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1996	4,347	3,468	7,815	54.0	38.3	45.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1997	4,691	3,742	8,433	56.3	40.5	47.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1998	4,472	3,508	7,980	52.9	37.3	44.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1999	4,721	3,648	8,369	54.7	37.9	45.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2000	4,885	3,815	8,700	55.3	38.8	46.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2001	5,089	3,881	8,970	56.3	38.8	46.5	363	224	587	4.3	2.1	3.0
2002	5,601	4,225	9,826	60.5	41.3	49.9	395	245	640	4.6	2.3	3.2
2003	5,563	4,019	9,582	58.9	38.6	47.7	357	246	603	4.0	2.2	3.0
2004	5,587	4,257	9,844	58.0	40.1	48.0	399	234	633	4.4	2.0	3.1
2005	6,128	4,684	10,812	62.4	43.3	51.8	394	267	661	4.3	2.3	3.1
2006	6,084	4,309	10,393	60.6	39.0	48.8	405	271	676	4.3	2.3	3.1
2007	6,014	4,389	10,403	58.1	38.9	47.5	452	286	738	4.6	2.3	3.3
2008	6,485	4,592	11,077	61.2	39.8	49.4	422	263	685	4.2	2.1	3.0
2009	6,579	4,702	11,281	60.6	39.7	49.2	479	285	764	4.6	2.2	3.3
2010	6,779	4,689	11,468	60.8	38.5	48.7	458	297	755	4.2	2.2	3.1
2011	6,760	4,811	11,571	58.7	38.8	48.0	498	291	789	4.5	2.1	3.2
2012	7,060	4,976	12,036	59.9	39.2	48.7	516	334	850	4.5	2.4	3.3
2013	7,244	5,097	12,341	59.7	39.5	48.8	515	309	824	4.4	2.2	3.2
2014	7,437	5,207	12,644	59.7	39.4	48.8	530	316	847	4.4	2.2	3.2
2015	7,639	5,320	12,959	59.8	39.4	48.8	547	324	871	4.4	2.2	3.2
2016	7,847	5,436	13,283	59.8	39.4	48.8	564	332	896	4.4	2.2	3.2

n.a. not available.

Notes

1. Cancer coded in ICD-10 as C43 and C44.
2. Rates are age-standardised to the estimated Australian population at 30 June 2001.

Source: ACD 2012.

Table A2: Number of new cases and age-specific incidence rates for melanoma, by age, 1982, 1992, 2002, 2012 (all actual data) and 2016 (estimated data)

	0–39	40–49	50–59	60–69	70–79	80+
Year	Number of new cases					
1982	1,000	588	675	673	429	154
1992	1,367	1,100	1,055	1,435	1,116	493
2002	1,396	1,526	1,987	1,865	1,939	1,113
2012	1,193	1,411	2,239	2,879	2,435	1,878
2016 (estimated)	1,221	1,491	2,443	3,247	2,714	2,168
	Age-specific rate (per 100,000)					
1982	10.1	36.4	44.6	57.1	62.2	57.9
1992	12.7	46.0	65.6	102.2	121.0	122.5
2002	12.7	53.1	84.0	121.7	168.0	180.2
2012	9.8	44.6	77.5	128.1	183.4	216.8
2016 (estimated)	9.4	45.4	80.2	129.7	174.7	229.1

Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-specific, and are expressed per 100,000 population.

Source: ACD 2012.

Table A3a: Trends in the number of hospitalisations and hospitalisation rates for melanoma, by sex, 2002–03 to 2013–14

	Number of hospitalisations			Rate (per 10,000)		
Year	Males	Females	Total	Males	Females	Total
2002–03	8,830	5,518	14,348	9.6	5.4	7.3
2003–04	9,742	6,001	15,743	10.3	5.7	7.8
2004–05	9,543	6,267	15,810	9.9	5.9	7.7
2005–06	10,153	6,826	16,979	10.3	6.3	8.1
2006–07	10,640	6,695	17,335	10.6	6.0	8.1
2007–08	11,196	6,879	18,075	10.9	6.0	8.2
2008–09	11,378	6,902	18,280	10.7	5.9	8.1
2009–10	11,164	7,031	18,195	10.3	5.9	7.9
2010–11	12,663	7,414	20,077	11.3	6.1	8.5
2011–12	12,705	7,713	20,418	11.0	6.2	8.4
2012–13	12,664	7,713	20,377	10.7	6.0	8.2
2013–14	14,925	8,512	23,437	12.3	6.5	9.2

Notes

1. Hospitalisation for which the care type was reported as 'Newborn with no qualified days' and records for 'Hospital boarders' and 'Posthumous organ procurement' have been excluded from the analysis.
2. Hospitalisations in which the principal diagnosis is melanoma (ICD-10-AM code C43) and NMSC (ICD-10-AM code C44).
3. Rates were age-standardised to the Australian population as 30 June 2001, and expressed per 10,000 population.

Source: NHMD.

Table A3b: Trends in the number of hospitalisations and hospitalisation rates for NMSC, by sex, 2002–03 to 2013–14

	Number of hospitalisations			Rate (per 10,000)		
Year	Males	Females	Total	Males	Females	Total
2002–03	49,464	32,967	82,431	56.3	30.6	41.7
2003–04	49,861	33,229	83,090	55.3	30.2	41.1
2004–05	48,652	32,754	81,406	52.8	29.2	39.3
2005–06	51,925	34,848	86,773	54.8	30.3	40.9
2006–07	53,344	35,772	89,116	54.7	30.4	41.0
2007–08	55,675	37,118	92,793	55.4	30.7	41.6
2008–09	56,978	37,644	94,622	55.1	30.4	41.3
2009–10	60,698	39,950	100,648	57.0	31.4	42.8
2010–11	64,038	42,165	106,203	58.2	32.5	43.9
2011–12	65,996	43,377	109,373	58.3	32.6	44.1
2012–13	66,795	44,078	110,873	57.1	32.3	43.4
2013–14	69,436	45,286	114,722	57.7	32.3	43.8

Notes

1. Hospitalisation for which the care type was reported as 'Newborn with no qualified days' and records for 'Hospital boarders' and 'Posthumous organ procurement' have been excluded from the analysis.
2. Hospitalisations in which the principal diagnosis is melanoma (ICD-10-AM code C43) and NMSC (ICD-10-AM code C44).
3. Rates were age-standardised to the Australian population as 30 June 2001, and expressed per 10,000 population.

Source: NHMD.

Table A4: Five-year relative survival after diagnosis from melanoma, by sex and age, 2007–2011

	Males		Females		Persons	
Age group (years)	5-year survival	95% CI	5-year survival	95% CI	5-year survival	95% CI
0–39	94	93.0–94.8	96.3	95.6–96.9	95.2	94.7–95.8
40–49	92.9	91.9–93.8	96.7	96.0–97.3	94.9	94.3–95.4
50–59	90.6	89.7–91.4	95.2	94.4–95.9	92.5	91.9–93.1
60–69	89.8	88.8–90.7	95	94.1–95.9	91.7	91.0–92.4
70–79	84.7	83.3–86.0	90.5	89.0–92.0	86.7	85.7–87.7
80+	77.3	74.6–80.1	82.7	79.6–85.7	79.5	77.5–81.6
All ages	**88.2**	**87.6–88.7**	**93.5**	**92.9–94.0**	**90.4**	**90.0–90.8**

Note: Cancer coded in ICD-10 as C43.
Source: ACD 2011.

Table A5: Relative survival from melanoma, by tumour thickness, 2007–2011

Years after diagnosis	0.01–1.00		1.01–2.00		2.01–4.00		> 4.00	
	5-year survival	95% CI	5-year survival	95% CI	5-year survival	95% CI	5-year survival	95% CI
1	100.4	100.3–100.5)	99.2	98.8–99.6)	97.4	96.6–98.1)	88.2	86.7–89.5)
2	100.4	100.2–100.6)	97.2	96.5–97.7)	90	88.9–91.1)	75.5	73.7–77.3)
3	100.2	100.0–100.5)	94.6	93.8–95.4)	84.8	83.4–86.1)	65.6	63.6–67.6)
4	100	99.7–100.2)	91.9	91.0–92.8)	79.8	78.2–81.2)	58.7	56.5–60.8)
5	**99.7**	**99.3–100.0)**	**90.1**	**89.1–91.1)**	**75.4**	**73.8–77.0)**	**54.3**	**52.0–56.5)**

Note: Cancer coded in ICD-10 as C43.
Source: ACD 2011.

Table A6: Number of deaths and mortality rates for melanoma and NMSC, by sex, 1982–2016

	Melanoma						NMSC					
	Number of deaths			Rate (per 100,000)			Number of deaths			Rate (per 100,000)		
Year	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
1982	380	216	596	6.4	3.2	4.7	132	57	189	2.7	0.9	1.7
1983	362	261	623	6.0	3.9	4.9	151	62	213	3.5	1.0	1.9
1984	397	243	640	6.4	3.5	4.8	153	75	228	3.3	1.1	2.0
1985	403	269	672	6.5	3.8	5.0	135	49	184	2.9	0.7	1.6
1986	418	270	688	6.8	3.7	5.0	147	59	206	2.9	0.8	1.7
1987	517	281	798	8.2	3.8	5.7	166	54	220	3.1	0.7	1.7
1988	478	293	771	7.3	3.8	5.4	158	52	210	3.0	0.7	1.6
1989	501	281	782	7.6	3.6	5.4	220	65	285	3.8	0.8	2.1
1990	512	317	829	7.5	3.9	5.6	208	56	264	3.6	0.7	1.9
1991	512	292	804	7.5	3.6	5.3	200	66	266	3.3	0.8	1.8
1992	523	344	867	7.5	4.1	5.5	286	87	373	4.7	1.0	2.5
1993	581	272	853	8.0	3.2	5.4	270	104	374	4.2	1.2	2.5
1994	609	288	897	8.3	3.3	5.5	261	97	358	3.9	1.1	2.3
1995	601	334	935	8.1	3.7	5.6	254	113	367	3.8	1.2	2.3
1996	580	323	903	7.7	3.5	5.3	244	115	359	3.7	1.2	2.2
1997	577	325	902	7.3	3.4	5.1	233	110	343	3.4	1.1	2.0
1998	623	343	966	7.7	3.5	5.4	242	116	358	3.4	1.1	2.1
1999	641	364	1,005	7.9	3.7	5.5	270	113	383	3.7	1.0	2.1
2000	617	354	971	7.3	3.5	5.2	241	118	359	3.1	1.1	1.9
2001	684	390	1,074	7.8	3.7	5.6	264	123	387	3.3	1.1	2.0
2002	722	329	1,051	8.2	3.0	5.3	278	137	415	3.4	1.2	2.1
2003	764	382	1,146	8.4	3.5	5.7	258	132	390	3.1	1.1	1.9
2004	815	384	1,199	8.8	3.4	5.8	252	109	361	3.0	0.9	1.7
2005	860	413	1,273	9.0	3.6	6.0	280	132	412	3.2	1.0	1.9
2006	795	455	1,250	8.2	3.9	5.8	273	137	410	3.0	1.0	1.8
2007	890	425	1,315	8.9	3.5	5.9	316	144	460	3.3	1.0	2.0
2008	942	455	1,397	9.1	3.6	6.1	262	141	403	2.7	0.9	1.7
2009	948	465	1,412	8.9	3.7	6.0	319	149	468	3.1	1.0	1.9
2010	984	448	1,432	9.0	3.5	5.9	300	143	443	2.8	0.9	1.8
2011	1,075	470	1,544	9.6	3.5	6.2	353	179	531	3.2	1.1	2.0
2012	1,042	496	1,515	9.0	3.6	5.9	369	167	521	3.2	1.0	1.9
2013	1,107	510	1,620	9.2	3.7	6.2	416	176	515	3.5	1.1	1.9
2014	1,137	516	1,680	9.2	3.6	6.3	353	180	525	2.9	1.1	1.9
2015	1,182	530	1,740	9.3	3.6	6.3	362	185	540	2.9	1.1	1.8
2016	1,229	545	1,770	9.4	3.6	6.2	369	190	560	2.8	1.1	1.9

Notes

1. Deaths registered in 2010 and earlier are based on the final version of death data; deaths registered in 2012 and 2013 are based on revised and preliminary versions, respectively, and are subject to further revision.
2. Cancer coded in ICD-10 as C43 (for 1997–2012) and in ICD-09 as172 (for 1982–1996), and cancer coded in ICD-10 as C44 (for 1997–2012) and in ICD-09 as 173 (for 1982–1996).
3. Rates are age-standardised to the estimated resident population of Australia for 30 June 2001.
4. The 2014, 2015 and 2016 estimates are based on 2002–2013 mortality data.
5. Actual mortality data for 1982–2012 are based on the year of occurrence of the death, and data for 2013 are based on the year of registration of the death.

Source: AIHW National Mortality Database.

Table A7: Number of deaths and age-specific mortality rates for melanoma, by age, 1982, 1992, 2002, 2012 (all actual data) and 2016 (estimated data)

	0–39	40–49	50–59	60–69	70–79	80+
Year	Number of deaths					
1982	93	79	115	141	117	51
1992	91	115	105	194	222	140
2002	58	104	147	193	284	265
2012	59	89	167	301	408	491
2016 (estimated)	52	95	210	362	466	589
	Age-specific rate (per 100,000)					
1982	0.9	4.9	7.6	12.0	17.0	19.2
1992	0.8	4.8	6.5	13.8	24.1	34.8
2002	0.5	3.6	6.2	12.6	24.6	42.9
2012	0.5	2.8	5.8	13.4	30.7	56.7
2016 (estimated)	0.4	2.9	6.9	14.5	30.0	62.2

Notes

1. Deaths registered in 2010 and earlier are based on the final version of death data; deaths registered in 2012 and 2013 are based on revised and preliminary versions, respectively, and are subject to further revision.
2. Cancer coded in ICD-10 as C43 (for 1997–2013) and in ICD-09 as 172 (for 1982–1996).
3. The rates were age-specific, and are expressed per 100,000 population.
4. The 2016 estimates are based on 2002–2013 mortality data.
5. Actual mortality data for 1982–2012 are based on the year of occurrence of the death, and data for 2013 are based on the year of registration of the death.

Source: AIHW National Mortality Database.

Table A8: Trends in age-standardised incidence rates of basal cell carcinoma, by sex, 1985, 1990, 1995 and 2002

	Males		Females		Persons	
Year	Rate (per 100,000)	95% CI	Rate (per 100,000)	95% CI	Rate (per 100,000)	95% CI
1985	735	623–847	593	491–694	657	585–729
1990	849	767–931	605	537–674	726	673–780
1995	955	879–1,034	629	568–696	788	739–840
2002	1,041	936–1,158	745	662–839	884	816–957

Notes: The rates were age-standardised to the World Standard Population (Cancer incidence in five continents: a technical report 1966) and adjusted for failure of confirmation (NCCI 2003).

Source: Staples et al. 2006.

Table A9: Trends in age-standardised incidence rates of squamous cell carcinoma, by sex, 1985, 1990, 1995 and 2002

	Males		Females		Persons	
Year	Rate (per 100,000)	95% CI	Rate (per 100,000)	95% CI	Rate (per 100,000)	95% CI
1985	209	149–268	122	75–169	166	128–204
1990	338	287–389	164	139–199	250	220–281
1995	419	372–473	228	193–268	321	292–354
2002	499	430–580	291	242–349	387	344–434

Notes: The rates were age-standardised to the World Standard Population (Cancer incidence in five continents: a technical report 1966) and adjusted for failure of confirmation (NCCI 2003).

Source: Staples et al. 2006.

Table A10: Number of new cases and age-specific incidence rates for rare NMSC, by age, 2001, 2012 (all actual data) and 2016 (estimated data)

	0–39	40–49	50–59	60–69	70–79	80+
Year	Number of new cases					
2001	53	45	60	92	168	169
2012	47	45	90	149	215	304
2016 (estimated)	57	47	81	150	236	324
	Age-specific rate (per 100,000)					
2001	0.5	1.6	2.6	6.2	14.6	28.6
2012	0.4	1.4	3.1	6.6	16.2	35.1
2016 (estimated)	0.4	1.4	2.7	6.0	15.2	34.3

Notes

1. Cancer coded in ICD-10 as C44 excluding BCC and SCC.
2. The rates were age-specific, and are expressed per 100,000 population.

Source: ACD 2012.

Table A11: Number of deaths and age-specific mortality rates for NMSC, by age, 1982, 1992, 2002, 2012 (all actual data) and 2016 (estimated data)

	0–39	40–49	50–59	60–69	70–79	80+
Year	**Number of deaths**					
1982	5	4	20	50	56	54
1992	29	17	30	67	105	125
2002	1	10	41	49	129	185
2012	2	8	34	76	119	282
2016 (estimated)	1	10	33	71	125	321
	Age-specific rate (per 100,000)					
1982	0.1	0.2	1.3	4.2	8.1	20.3
1992	0.3	0.7	1.9	4.8	11.4	31.1
2002	0.0	0.3	1.7	3.2	11.2	29.9
2012	0.0	0.3	1.2	3.4	9.0	32.6
2016 (estimated)	0.0	0.3	1.1	2.8	8.0	33.9

Notes

1. Deaths registered in 2010 and earlier are based on the final version of death data; deaths registered in 2012 and 2013 are based on revised and preliminary versions, respectively, and are subject to further revision.
2. Cancer coded in ICD-10 as C44 (for 1997–2013) and in ICD-09 as 173 (for 1982–1996).
3. The rates were age-specific, and are expressed per 100,000 population.
4. The 2014, 2015 and 2016 estimates are based on 2002–2013 mortality data.
5. Actual mortality data from 1982 to 2012 are based on the year of occurrence of the death, and data for 2013 are based on the year of registration of the death.

Source: AIHW National Mortality Database.

Table A12: Number of cases and incidence rate for melanoma, by remoteness area, 2005–2009

Remoteness area	Number of new cases	Percentage of all melanomas	Rate (per 100,000)
Major cities	33,794	62.7	45.2
Inner regional	13,527	25.1	61.8
Outer regional	5,706	10.6	54.3
Remote	695	1.3	49.2
Very remote	202	0.4	28.6

Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Remoteness was classified according to the Australian Standard Geographical Classification Remoteness Areas.

Source: ACD 2011.

Table A13: Number of deaths and mortality rates for melanoma, by remoteness area, 2008–2012

Remoteness area	Number of deaths	Percentage of all melanomas	Rate (per 100,000)
Major cities	4,630	63.6	5.7
Inner regional	1,816	24.9	7.2
Outer regional	750	10.3	6.5
Remote	68	0.9	4.9
Very remote	21	0.3	3.1

Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Deaths registered in 2010 and earlier are based on the final version of cause of death data; deaths registered in 2011 and 2012 are based on revised and preliminary versions, respectively, and are subject to further revision by the ABS.
4. Remoteness was classified according to the Australian Standard Geographical Classification Remoteness Areas.
5. Mortality data for 2008–2011 are based on the year of occurrence of the death, and data for 2012 are based on the year of registration of the death.

Source: AIHW National Mortality Database.

Table A14: Number of cases and incidence rate for melanoma, by socioeconomic group, 2005–2009

Socioeconomic group	Number of new cases	Percentage of all melanomas	Rate (per 100,000)
1 (lowest socioeconomic group)	7,739	18.0	42.7
2	9,682	22.5	52.0
3	8,370	19.4	48.3
4	8,077	18.7	48.5
5 (highest socioeconomic group)	9,246	21.4	52.0

Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Socioeconomic disadvantage was classified using the ABS Index of Relative Socio-economic Disadvantage, where 1 represents the lowest socioeconomic group and 5 represents the highest socioeconomic group.

Source: ACD 2011.

Table A15: Number of deaths and mortality rate for melanoma, by socioeconomic group, 2009–2012

Socioeconomic group	Number of deaths	Percentage of all melanomas	Rate (per 100,000)
1 (lowest socioeconomic group)	1,175	20.0	5.9
2	1,289	21.9	6.3
3	1,255	21.3	6.3
4	1,083	18.4	5.9
5 (highest socioeconomic group)	1,087	18.5	5.8

Notes

1. Cancer coded in ICD-10 as C43.
2. The rates were age-standardised to the Australian population as at 30 June 2001, and are expressed per 100,000 population.
3. Socioeconomic disadvantage was classified using the ABS Index of Relative Socio-economic Disadvantage, where 1 represents the lowest socioeconomic group and 5 represents the highest socioeconomic group.
4. Deaths registered in 2010 and earlier are based on the final version of cause of death data; deaths registered in 2011 and 2012 are based on revised and preliminary versions, respectively, and are subject to further revision by the ABS.
5. Mortality data for 2008–2011 are based on the year of occurrence of the death, and data for 2012 are based on the year of registration of the death.

Source: AIHW National Mortality Database.

Appendix B: Defining rare non-melanoma skin cancer

Histology codes for rare non-melanoma skin cancer are presented in Table B1.

Table B1: Histology codes for rare non-melanoma skin cancer

Histology code	Names of rare NMSC	Histology code	Names of rare NMSC
8247	Merkel cell carcinoma	8012	Large cell carcinoma, NOS
8832	Dermatofibrosarcoma, NOS	8802	Giant cell sarcoma
8830	Malignant fibrous histiocytoma	8810	Fibrosarcoma, NOS
8410	Sebaceous adenocarcinoma	9044	Clear cell sarcoma, NOS
8890	Leiomyosarcoma, NOS	8123	Basaloid carcinoma
8010	Carcinoma, NOS	8850	Liposarcoma, NOS
8407	Sclerosing sweat duct carcinoma	8003	Malignant tumour, giant cell type
8000	Neoplasm, malignant	8021	Carcinoma, anaplastic, NOS
8390	Skin appendage carcinoma	8403	Malignant eccrine spiradenoma
9120	Haemangiosarcoma	8833	Pigmented dermatofibrosarcoma protuberans
8041	Small cell carcinoma, NOS	8852	Myxoid liposarcoma
8400	Sweat gland adenocarcinoma	9041	Synovial sarcoma, spindle cell
8413	Eccrine adenocarcinoma	8430	Mucoepidermoid carcinoma
8560	Adenosquamous carcinoma	8854	Pleomorphic liposarcoma
8409	Eccrine poroma, malignant	9540	Malignant peripheral nerve sheath tumour
8246	Neuroendocrine carcinoma, NOS	8310	Clear cell adenocarcinoma, NOS
8032	Spindle cell carcinoma, NOS	8022	Pleomorphic carcinoma
8542	Paget disease, extramammary	8805	Undifferentiated sarcoma
8200	Adenoid cystic carcinoma	8045	Combined small cell carcinoma
8980	Carcinosarcoma, NOS	8143	Superficial spreading adenocarcinoma
8004	Malignant tumour, spindle cell type	8240	Carcinoid tumour, NOS
8800	Sarcoma, NOS	8500	Infiltrating duct carcinoma, NOS
8401	Apocrine adenocarcinoma	8815	Solitary fibrous tumour, malignant
8020	Carcinoma, undifferentiated, NOS	8858	Dedifferentiated liposarcoma
8402	Nodular hidradenoma, malignant	9070	Embryonal carcinoma, NOS
8408	Eccrine papillary adenocarcinoma	9133	Epithelioid haemangioendothelioma, malignant
8811	Fibromyxosarcoma	9180	Osteosarcoma, NOS
8140	Adenocarcinoma, NOS	8031	Giant cell carcinoma
8033	Pseudosarcomatous carcinoma	8260	Papillary adenocarcinoma, NOS
8480	Mucinous adenocarcinoma	8894	Angiomyosarcoma
8940	Mixed tumour, malignant, NOS	8001	Tumour cells, malignant
8804	Epithelioid sarcoma	8005	Malignant tumour, clear cell type
8891	Epithelioid leiomyosarcoma	8011	Epithelioma, malignant
8801	Spindle cell sarcoma	8120	Transitional cell carcinoma, NOS

(continued)

Table B1 (continued): Histology codes for rare non-melanoma skin cancer

Histology code	Names of rare NMSC	Histology code	Names of rare NMSC
8270	Chromophobe carcinoma	8030	Giant cell and spindle cell carcinoma
8290	Oxyphilic adenocarcinoma	8230	Solid carcinoma, NOS
8420	Ceruminous adenocarcinoma	8046	Non-small cell carcinoma
8441	Serous cystadenocarcinoma, NOS	8124	Cloacogenic carcinoma
8470	Mucinous cystadenocarcinoma, NOS	8490	Signet ring cell carcinoma
8806	Desmoplastic small round cell tumour	8570	Adenocarcinoma with squamous metaplasia
8941	Carcinoma in pleomorphic adenoma	8825	Low grade myofibroblastic sarcoma
9080	Teratoma, malignant, NOS	8836	Malignant angiomatoid fibrous histiocytoma
9150	Haemangiopericytoma, malignant	8840	Myxosarcoma
9170	Lymphangiosarcoma	8855	Mixed type liposarcoma
9220	Chondrosarcoma, NOS	8896	Myxoid leiomyosarcoma
9260	Ewing sarcoma	8920	Alveolar rhabdomyosarcoma
9364	Peripheral neuroectodermal tumour	8982	Malignant myoepithelioma
9450	Oligodendroglioma, NOS	9071	Yolk sac tumour

NOS not otherwise specified.

Note: Codes were sourced from the International Classification of Diseases for Oncology, 3rd edition.

Appendix C: Medicare data

Medicare subsidised services

The Australian Government's funding contributions include a universal public health insurance scheme, Medicare. Medicare was introduced in 1984 to provide free or subsidised access to public hospital services and to treatment by health professionals (including doctors, optometrists and some other health professionals) (DHS 2013).

The Medicare system has 3 parts: hospital, medical and pharmaceutical. Coverage of pharmaceuticals predates Medicare, with the Pharmaceutical Benefits Scheme introduced in 1948.

The numbers presented in this report include only services performed by a registered provider in 2014, which qualified for a Medicare benefit, and for which a claim has been processed and paid for by the Department of Human Services. They do not include services provided by hospital doctors to public patients in public hospitals or services that qualify for a benefit under the Department of Veterans' Affairs National Treatment Account.

Medicare item numbers for services and spending

Table C1: Medicare item numbers for melanoma

Medicare item number	Description
31300	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from nose, eyelid, lip, ear, digit or genitalia; tumour size up to and including 10 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31305	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from nose, eyelid, lip, ear, digit or genitalia; tumour size more than 10 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31310	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from face, neck (anterior to sternomastoid muscles) or lower leg (mid-calf to ankle); tumour size up to and including 10 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31315	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from face, neck (anterior to sternomastoid muscles) or lower leg (mid calf to ankle); tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31320	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from face, neck (anterior to sternomastoid muscles) or lower leg (mid-calf to ankle); tumour size more than 20 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31320	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from face, neck (anterior to sternomastoid muscles) or lower leg (mid-calf to ankle); tumour size more than 20 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31325	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from areas of the body not covered by items 31300 and 31310; tumour size up to and including 10 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31330	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from areas of the body not covered by items 31305 and 31310; tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31335	**Malignant melanoma, appendageal carcinoma, malignant fibrous tumour of skin, Merkel cell carcinoma of skin, or Hutchinson's melanotic freckle**—removal from areas of the body not covered by items 31305 and 31320; tumour size more than 20 millimetre in diameter; where removal is by definitive surgical excision (as defined above and in the explanatory notes to this category) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained

Source: DHS 2014.

Table C2: Medicare item numbers for non-melanoma skin cancers

Medicare item number	Description
30196	**Malignant neoplasm of skin or mucous membrane**—proven by histopathology or confirmed by specialist opinion; removal by serial curettage or carbon dioxide laser or erbium laser excision-ablation, including any associated cryotherapy or diathermy; not being a service to which item 30197 applies
30197	**Malignant neoplasm of skin or mucous membrane**—proven by histopathology or confirmed by specialist opinion; removal by serial curettage or carbon dioxide laser excision-ablation, including any associated cryotherapy or diathermy (10 or more lesions)
30202	**Malignant neoplasm of skin or mucous membrane**—proven by histopathology or confirmed by specialist opinion; removal by liquid nitrogen cryotherapy using repeat freeze-thaw cycles; not being a service to which item 30203 applies
30203	**Malignant neoplasm of skin or mucous membrane**—proven by histopathology or confirmed by specialist opinion; removal by liquid nitrogen cryotherapy using repeat freeze-thaw cycles (10 or more lesions)
30205	**Malignant neoplasm of skin** proven by histopathology—removal by liquid nitrogen cryotherapy using repeat freeze-thaw cycles where the malignant neoplasm extends into the cartilage
31255	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from nose, eyelid, lip, ear, digit or genitalia; tumour size up to and including 10 millimetres in diameter; where removal is by therapeutic surgical excision (other than by shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31256	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from nose, eyelid, lip, ear, digit or genitalia, where previous excision was performed by the same practitioner; original tumour size was up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31257	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from nose, eyelid, lip, ear, digit or genitalia; where performed by a practitioner other than the practitioner who provided the previous treatment;, original tumour size was up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31258	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal from nose, eyelid, lip, ear, digit or genitalia, whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained; not being a service to which item 31295 applies
31260	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from nose, eyelid, lip, ear, digit or genitalia; tumour size more than 10 millimetres in diameter; where removal is by therapeutic surgical excision (other than shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31261	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from nose, eyelid, lip, ear, digit or genitalia; where previous excision was performed by the same practitioner; original tumour size more than 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31262	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from nose, eyelid, lip, ear, digit or genitalia; where performed by a practitioner other than the practitioner who provided the previous treatment; original tumour size more than 10 millimetre in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31263	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal of, from nose, eyelid, lip, ear, digit or genitalia, whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size more than 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained; not being a service to which item 31295 applies

(continued)

Table C2 (continued): Medicare item numbers for non-melanoma skin cancers

Medicare item number	Description
31265	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from face, neck, (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); tumour size up to and including 10 millimetres in diameter; where removal is by therapeutic surgical excision (other than by shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31266	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal of, from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); where previous excision was performed by the same practitioner; original tumour size up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31267	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal of, from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); where performed by a practitioner other than the practitioner who provided the previous treatment; original tumour size up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31268	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal of, from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle), whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained ; not being a service to which item 31295 applies
31270	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from face, neck, (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by therapeutic surgical excision (other than by shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31271	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); where previous excision was performed by the same practitioner; original tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31272	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle), where performed by a practitioner other than the practitioner who provided the previous treatment; original tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31273	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal of, from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained; not being a service to which item 31295 applies
31275	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); tumour size more than 20 millimetres in diameter; where removal is by therapeutic surgical excision (other than by shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31276	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); where previous excision was performed by the same practitioner; original tumour size more than 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination

(continued)

Table C2 (continued): Medicare item numbers for non-melanoma skin cancers

Medicare item number	Description
31277	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); where performed by a practitioner other than the practitioner who provided the previous treatment; original tumour size more than 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31278	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal from face, neck (anterior to the sternomastoid muscles) or lower leg (mid-calf to ankle); whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size more than 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained; not being a service to which item 31295 applies
31280	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from areas of the body not covered by items 31255 and 31265; tumour size up to and including 10 millimetres in diameter; where removal is by therapeutic surgical excision (other than by shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31281	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from areas of the body not covered by items 31255 and 31265; where previous excision was performed by the same practitioner; original tumour size up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31282	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from areas of the body not covered by items 31255 and 31265; performed by a practitioner other than the practitioner who provided the previous treatment; original tumour size up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31283	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal from areas of the body not covered by items 31255 and 31265; whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size up to and including 10 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31285	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from areas of the body not covered by items 31260 and 31270; tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by therapeutic surgical excision (other than by shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31286	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from areas of the body not covered by items 31260 and 31270; where previous excision was performed by the same practitioner; original tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31287	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from areas of the body not covered by items 31260 and 31270; performed by a practitioner other than the practitioner who provided the previous treatment; original tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31288	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal from areas of the body not covered by items 31260 and 31270; whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size more than 10 millimetres and up to and including 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained

(continued)

Table C2 (continued): Medicare item numbers for non-melanoma skin cancers

Medicare item number	Description
31290	**Basal cell carcinoma or squamous cell carcinoma** (including keratocanthoma)—removal from areas of the body not covered by items 31260 and 31275; tumour size more than 20 millimetres in diameter; where removal is by therapeutic surgical excision (other than by shave excision) and suture, and the initial specimen removed is sent for histological examination and malignancy confirmed, and any subsequently excised specimen is sent for histological examination
31291	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from areas of the body not covered by items 31260 and 31275; where previous excision was performed by the same practitioner; original tumour size more than 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31292	**Basal cell carcinoma or squamous cell carcinoma**, **residual**—removal from areas of the body not covered by items 31260 and 31275; performed by a practitioner other than the practitioner who provided the previous treatment; original tumour size more than 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination
31293	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—removal from areas of the body not covered by items 31260 and 31275; whether previous excision was performed by the same practitioner or by a practitioner other than the practitioner who provided the previous treatment; tumour size more than 20 millimetres in diameter; where removal is by surgical excision (other than by shave excision) and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31295	**Basal cell carcinoma or squamous cell carcinoma**, **recurrent**—where lesion was treated by previous surgery, serial cautery and curettage, radiotherapy or 2 prolonged freeze/thaw cycles of liquid nitrogen therapy; performed by a specialist in the practice of his or her specialty or by a practitioner other than the practitioner who provided the previous treatment; removal from the head or neck (anterior to the sternomastoid muscles); where removal is by surgical excision and suture, and the specimen excised is sent for histological examination and confirmation of malignancy has been obtained
31000	**Micrographically controlled serial excision of skin tumour**—using horizontal frozen sections with mapping of all excised tissue, and histological examination of all excised tissue by the specialist performing the procedure; 6 or fewer sections
31001	**Micrographically controlled serial excision of skin tumour**—using horizontal frozen sections with mapping of all excised tissue, and histological examination of all excised tissue by the specialist performing the procedure; 7–12 sections (inclusive)
31002	**Micrographically controlled serial excision of skin tumour**—using horizontal frozen sections with mapping of all excised tissue, and histological examination of all excised tissue by the specialist performing the procedure; 13 or more sections

Source: DHS 2014.

Appendix D: Defining hospitalisations for skin cancer

Terms and classifications on admitted patient care

Statistics on admitted patients are compiled when an **admitted patient** (a patient who undergoes a hospital's formal admission process) completes an episode of admitted patient care and 'separates' from the hospital. This is because most of the data on the use of hospitals by admitted patients are based on information provided at the end of the patients' episodes of care, rather than at the beginning. The length of stay and the procedures carried out are then known, and the diagnostic information is more accurate.

Separation is the term used to refer to the episode of admitted patient care, which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute care to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care.

Patient day (or day of patient care) means the occupancy of a hospital bed (or chair in the case of some same-day patients) by an admitted patient for all or part of a day. The length of stay for an overnight patient is calculated by subtracting the date the patient is admitted from the date of separation, then deducting days the patient was on leave. A same-day patient is allocated a length of stay of 1 day.

A **same-day separation** occurs when a patient is admitted to, and separated from, the hospital on the same date. As a separation might be generated by a transfer between hospitals, or a change in the type of care provided, same-day separations might include records for patients whose stay in hospital was longer than one day but involved more than one separation.

An **overnight** separation occurs when a patient is admitted to, and separated from, the hospital on different dates.

The **principal diagnosis** is the diagnosis established after study to be chiefly responsible for occasioning the patient's episode of admitted patient care. An **additional diagnosis** is a condition or complaint that either coexists with the principal diagnosis or arises during the episode of care. An additional diagnosis is reported if the condition affects patient management.

In 2013–14, diagnoses and external causes of injury were recorded using the 8th edition of the *International statistical classification of diseases and related health problems, 10th revision, Australian modification* (ICD-10-AM) (NCCC 2012c).

A **procedure** is a clinical intervention that is surgical in nature, carries an anaesthetic risk, requires specialised training and/or requires special facilities or services available only in an acute care setting. Procedures encompass surgical procedures and non-surgical investigative and therapeutic procedures, such as x-rays. Patient support interventions that are neither investigative nor therapeutic (such as anaesthesia) are also included. In 2013–14, procedures were recorded using the 8th edition of the *Australian classification of health interventions* (NCCC 2012a, NCCC 2012b).

See Glossary for more information and more terms on admitted patient care.

Definition of melanoma and NMSC-related hospitalisations

Codes used for melanoma and NMSC-related hospitalisations are provided in Table D1.

Table D1: Definition of melanoma and NMSC-related hospitalisations

		Codes	
Group	**Definition**	**Principal diagnosis**	**Additional diagnosis**
Melanoma	Principal diagnosis of melanoma	C43 (melanoma)	. .
	Additional diagnosis of melanoma	. .	C43 (melanoma)
NMSC	Principal diagnosis of NMSC	C44 (NMSC)	. .
	Additional diagnosis of NMSC	. .	C44 (NMSC)

. . not applicable.

Note: Codes were sourced from the 8th edition of the *Australian classification of health interventions* (NCCC 2012a).

Definition of melanoma and NMSC-related procedures

Table D2: Definition of melanoma and NMSC-related procedures

Group	Block code	Procedure
Excision	1618	Biopsy of skin and subcutaneous tissue
	1620	Excision of lesion(s) of skin and subcutaneous tissue
	1626	Microscopically controlled excision of lesion(s) of skin
	1628	Other debridement of skin and subcutaneous tissue
	1632	Excision of toenail
	1634	other excision procedure on skin and subcutaneous tissue
Repair	1635	Repair of wound of skin and subcutaneous tissue
	1640	Allograft, xenograft or synthetic skin graft
	1642	Other split skin graft to granulating area
	1645	Other split skin graft, small
	1646	Other split skin graft, extensive
	1647	Split skin graft, inlay
	1649	Other full thickness skin graft
	1651	Local skin flap, single stage
	1653	Direct distant skin flap
	1654	Indirect distant skin flap
	1655	Other repair procedures on skin and subcutaneous tissue

Note: Codes were sourced from the 8th edition of the *Australian classification of health interventions* (NCCC 2012a).

Table D3: Definition of chemotherapy

Group	Block code	Procedure codes
Antineoplastic chemotherapy	1920 (from 2004–05 to 2013–14)	9619600, 9619700, 9619800, 9619900,9620000, 9620100, 9620200, 9620300, 9620500, 9620600, 9620900
	1780 and 1784 (from 2002–03 to 2003–04)	1391500, 1392100, 1392700, 1391800, 1393900, 1394803, 9676000, 9076700, 9076800

Note: Codes were sourced from the 8th edition of the *Australian classification of health interventions* (NCCC 2012a).

Appendix E: Statistical methods and technical notes

Age-specific rates

Age-specific rates provide information on the incidence of a particular event in an age group relative to the total number of people at risk of that event in the same age group. It is calculated by dividing the number of events occurring in each specified age group by the corresponding 'at-risk' population in the same age group, and then multiplying the result by a constant to derive the rate. Age-specific rates are often expressed per 100,000 population.

Age-standardised rates

A crude rate provides information on the number of, for example, new cases of cancer or deaths from cancer by the population at risk in a specified period. No age adjustments are made when calculating a crude rate. Since the risk of cancer is heavily dependent on age, crude rates are not suitable for looking at trends or making comparisons across groups in cancer incidence and mortality. More meaningful comparisons can be made by the use of age-standardised rates, with such rates adjusted for age, to enable comparisons between populations that have different age structures. This standardisation process effectively removes the influence of age structure on the summary rate.

Two methods are commonly used to adjust for age: direct and indirect standardisation. In this report, the direct standardisation approach presented by Jensen and colleagues (1991) is used. To age-standardise using the direct method, the first step is to obtain population numbers and numbers of cases (or deaths) in age ranges—typically 5-year age ranges.

The next step is to multiply the age-specific population numbers for the standard population (in this case, the Australian population as at 30 June 2001) by the age-specific incidence rates (or death rates) for the population of interest (such as those in a certain socioeconomic status group or those in *Major cities*). The next step is to sum across the age groups, and divide this sum by the total of the standard population to give an age-standardised rate for the population of interest. Finally, this is expressed per 1,000, 10,000 or 100,000 as appropriate.

Relative survival

Relative survival is a measure of the survival of people with cancer compared with that of the general population. It is the standard approach used by cancer registries to produce population-level survival statistics, as it does not require information on cause of death. Instead, relative survival reflects the net survival (or excess mortality) associated with cancer, by adjusting the survival of those with cancer for the underlying mortality that they would have experienced in the general population.

Relative survival is calculated by dividing observed survival by expected survival, where the numerator and denominator have been matched for age, sex and calendar year. Observed survival refers to the proportion of people alive for a given amount of time after a diagnosis of cancer, and is calculated from population-based cancer data. Expected survival refers to

the proportion of people in the general population alive for a given amount of time, and is calculated from life tables of the entire Australian population, assumed to be cancer free.

A simplified example of how relative survival is interpreted is shown in Figure E1. Given that 6 in 10 people with cancer are alive 5 years after their diagnosis (observed survival of 0.6), and that 9 in 10 people from the general population are alive after the same 5 years (expected survival of 0.9), the relative survival of people with cancer would be calculated as 0.6 divided by 0.9, or 0.67. This means that individuals with cancer are 67% as likely to be alive for at least 5 years after their diagnosis compared with their counterparts in the general population.

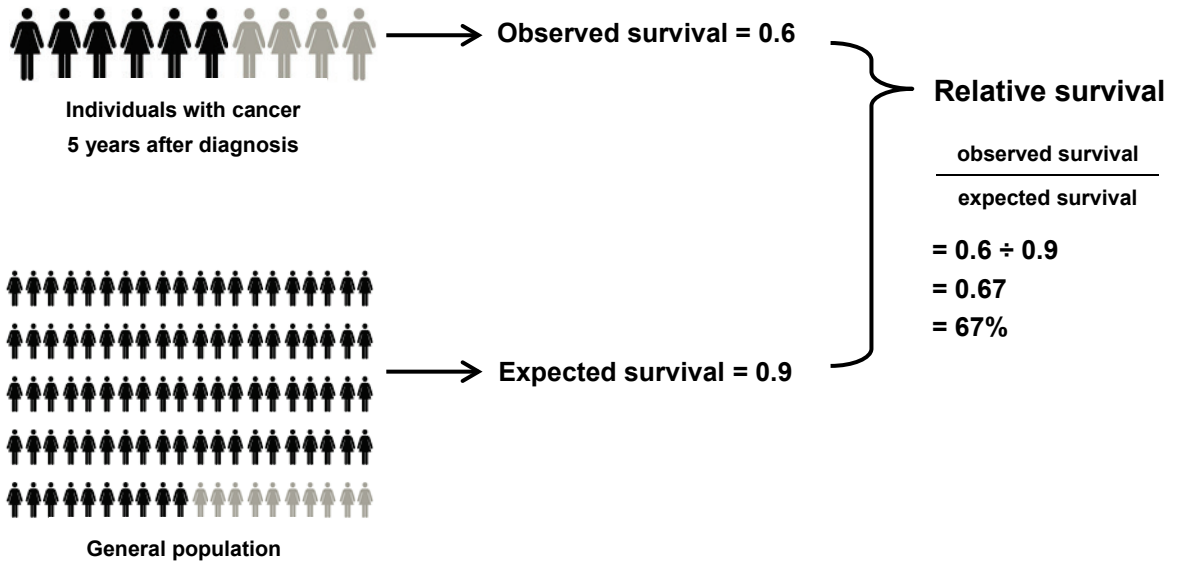


Figure E1: Simplified example of how relative survival is calculated

All observed survival was calculated from data in the ACD. Expected survival was calculated from the life tables of the entire Australian population, as well as the Australian population stratified by remoteness area and socioeconomic status groups. The Ederer II method was used to determine how long people in the general population are considered to be at risk. It is the default approach, whereby matched people in the general population are considered to be at risk until the corresponding cancer patient dies or is censored (Ederer & Heise 1959).

The survival analysis was based on records of primary and invasive cancers diagnosed between 1982 and 2011. At the time of analysis, these cases had been followed for deaths (from any cause) to the end of 2011. As such, the censor date selected for survival analysis was 31 December 2011.

The period method was used to calculate the survival estimates in this report (Brenner & Gefeller 1996), in which estimates are based on the survival experience during a given at-risk or follow-up period. Time at risk is left truncated at the start of the period and right censored at the end so that anyone who is diagnosed before this period and whose survival overlaps with this period would be included in the analysis. The main follow-up period in this report was for 2007–2011, which was used for the most up-to-date estimates of survival, by age and tumour thickness. All survival statistics in this report were produced using SAS statistical software, and calculated using software written by Dickman (2004).

Appendix F: Data sources

To provide a comprehensive picture of national cancer statistics in this report, various data sources were used, including AIHW and external data sources.

AIHW Australian Cancer Database

The ACD contains unit record data for every cancer diagnosed in Australia since 1982, excluding non-melanoma skin cancer. The state and territory cancer registries collect these data in their respective jurisdictions (and under their respective legislation). An agreed subset of the data is supplied annually to the AIHW, where it is compiled into the ACD.

The ACD currently contains data on all cases of cancer diagnosed from 1982 to 2009 for all states and territories, and for 2010 and 2011 for all except New South Wales and the Australian Capital Territory. Incidence projections were calculated for 2012–2016. See the *Cancer in Australia: an overview 2014* (AIHW & AACR 2014) for more details.

The 2010 and 2011 incidence data for New South Wales and the Australian Capital Territory were not available for inclusion in the 2011 version of the ACD, and were estimated by the AIHW. See the *Cancer in Australia: an overview 2014* (AIHW & AACR 2014) for more details.

The data quality statement for the ACD 2011 can be found at: <http://meteor.aihw.gov.au/content/index.phtml/itemId/586979>.

AIHW National Hospital Morbidity Database

The AIHW NHMD is compiled from data supplied by the state and territory health authorities. It is a collection of electronic confidentialised summary records for episodes of admitted patient care (separations or hospitalisations) in essentially all public and private hospitals in Australia. The data include demographic, administrative and clinical information, including patient diagnoses and other procedures.

The data quality statement for the AIHW NHMD 2013–14 can be found at: <http://meteor.aihw.gov.au/content/index.phtml/itemId/611030>.

AIHW National Mortality Database

The AIHW NMD contains information on the number of deaths from 1964 to 2012. Cause of Death Unit Record File data are provided to the AIHW by the Registries of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice), and include cause of death coded by the Australian Bureau of Statistics. The data are maintained by the AIHW in the NMD.

The data quality statements underpinning the AIHW NMD can be found in the following ABS publication: *Quality declaration summary, Causes of death, 2012*, ABS cat. no. 3303.0at: <www.abs.gov.au/ausstats/abs@.nsf/Lookup/3303.0Quality+Declaration02012>.

National Death Index

The National Death Index (NDI) contains records of all deaths occurring in Australia since 1980. The data are obtained from the Registrars of Births, Deaths and Marriages in each state and territory. The NDI is designed to enable epidemiological studies, and its use is strictly confined to medical research.

Cancer incidence records from the ACD were linked to the NDI and used to calculate the survival and prevalence data presented in this report.

The data quality statement for the NDI can be found at: <http://meteor.aihw.gov.au/content/index.phtml/itemId/480010>.

Population data

Throughout this report, population data were used to derive rates of cancer incidence and mortality. The population data were sourced from the Australian Bureau of Statistics using the most up-to-date estimates available at the time of analysis.

To derive its estimates of the resident populations, the Australian Bureau of Statistics uses the 5-yearly Census of Population and Housing data and adjusts it as follows:

- All respondents in the Census are placed in their state or territory, Statistical Local Area and postcode of usual residence; overseas visitors are excluded.
- An adjustment is made for people missed in the Census.
- Australians temporarily overseas on Census night are added to the usual residence Census count.

Estimated resident populations are then updated each year from the Census data, using indicators of population change such as births, deaths and net migration. More information is available at <www.abs.gov.au>.

Glossary

additional diagnosis: A condition or complaint that either coexists with the principal diagnosis or arises during the episode of care. An additional diagnosis is reported if the condition affected patient management.

admitted patient: A patient who undergoes a hospital's admission process to receive treatment and/or care. This treatment and/or care is provided over a period of time, and can occur in hospital and/or in the person's home (for hospital-in-the-home patients). METeOR identifier: 268957.

age-specific rate: A rate for a specific age group, with the numerator and denominator relating to the same age group.

age-standardisation: A method of removing the influence of age when comparing populations with different age structures. This is usually necessary because the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure, then the disease rates that would have occurred with that structure are calculated and compared.

benign: Non-cancerous tumours that may grow larger but do not spread to other parts of the body.

cancer (malignant neoplasm): A large range of diseases in which some of the body's cells become defective, begin to multiply out of control, can invade and damage the area around them, and can also spread to other parts of the body to cause further damage.

carcinoma: A cancer that begins in the lining layer (epithelial cells) of organs.

confidence interval (CI): A statistical term describing a range (interval) of values within which we can be 'confident' that the true value lies, usually because it has a 95% or higher chance of doing so.

death due to cancer: A death where the underlying cause is indicated as cancer.

expected survival: A measure of survival that reflects the proportion of people in the general population alive for a given amount of time. Expected survival estimates are crude estimates calculated from life tables of the general population by age, sex and calendar year.

health system spending: Includes spending on health good and services (for example, medications, aids and appliances, medical treatment, public health, research) that collectively are termed current spending; and on health-related investment which is often referred to as capital spending.

histology: The microscopic characteristics of cellular structure and composition of tissue.

hospitalisation: See **separation**.

incidence: The number of new cases diagnosed (of an illness of event, and so on) in a given period.

International Statistical Classification of Diseases and Related Health Problems: The world Health Organization's internationally accepted classification of death and disease. The 10th revision (ICD-10) is currently in use. ICD-10-AM is the Australian modification of ICD-10, and is used for diagnoses and procedures recorded for patients admitted to hospitals.

invasive: See **malignant**.

life-tables: Tables of annual probabilities of death in the general population.

malignant: A tumour with the capacity to spread to surrounding tissue or to other sites in the body.

metastasis: See **secondary cancer**.

mortality due to cancer: The number of deaths which occurred during a specified period (usually a year) for which the underlying cause of death was recorded as cancer.

new cancer case: See **incidence**.

neoplasm: An abnormal ('neo', new) growth of tissue. Can be 'benign' (not a cancer) or 'malignant' (a cancer). Also known as a tumour.

observed survival: A measure of survival that reflects the proportion of people alive for a given amount of time after diagnosis of cancer. Observed survival estimates are crude estimates calculated from population-based data.

population estimates: Official population numbers compiled by the Australian Bureau of Statistics at both state and territory and statistical local area levels, by age and sex, as at 30 June each year. These estimates allow comparisons to be made between geographical areas of differing population sizes and age structures.

primary cancer: A tumour that is at the site where it first formed (see also *secondary cancer*).

principal diagnosis: The diagnosis established after study to be chiefly responsible for the patient's episode of care in hospital.

procedure: A clinical intervention that is surgical in nature, carries a procedural risk, carries an anaesthetic risk, requires specialised training and/or requires special facilities or equipment available only in the acute care setting.

relative survival: The ratio of observed survival of a group of people diagnosed with cancer to expected survival of those in the corresponding general population after a specified interval following diagnosis (such as 5 or 10 years).

risk factor: Any factor that represents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as cause of disease, other are not necessarily so. Along with their opposite, namely protective factors, risk factors are known as 'determinants'.

secondary cancer: A tumour that originated from a cancer elsewhere in the body. Also referred to as a metastasis.

separation: An episode of care for an admitted patient, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation).

Separation also means the process by which an admitted patient completes an episode of care either by being discharged, dying, transferring to another hospital or changing type of care. In this report, separations are also referred to as hospitalisations.

skin cancer: A term used to describe various malignancies that can originate in the skin; including melanoma of the skin and non-melanoma skin cancer (NMSC).

stage: The extent of a cancer in the body. Staging is usually based on the size of the tumour, whether lymph nodes contain cancer, and whether the cancer has spread from the original site to other parts of the body.

Statistical Local Area: An Australian Standard Geographical Classification defined area that consists of one or more Collection Districts. Statistical Local Areas are whole, or parts of, Local Government Areas. Where there is no incorporated body of local government, Statistical Local Areas are defined to cover the unincorporated areas. Together, Statistical Local Areas cover the whole of Australia without gaps or overlaps.

survival: The probability of being alive for a given amount time after a particular event, such as a diagnosis of cancer (see also **relative survival**).

underlying cause of death: The disease or injury that initiated the sequence of events leading directly to death.

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Related publications

The following AIHW publications relating to cancer might be of interest:

- AIHW 2015. Breast cancer in young women: key facts about breast cancer in women in their 20s and 30s. Cancer series no. 96. Cat. no. CAN 94. Canberra: AIHW.
- AIHW 2014a. Cancer in Australia: an overview 2014. Cancer series no. 90. Cat. no. CAN 88. Canberra: AIHW.
- AIHW 2014b. Head and neck cancers in Australia. Cancer series no. 83. Cat. no. CAN 80. Canberra: AIHW.

Skin cancer (melanoma and non-melanoma skin cancers) accounts for the largest number of cancers diagnosed in Australia each year. This report provides an overview of skin cancer in Australia, risk factors, and key summary measures, including incidence, hospitalisations, survival and mortality. It shows that while the age-standardised incidence rate has risen for most age groups, for Australians aged less than 40, the incidence rate for melanoma of the skin has declined.