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Summary

BreastScreen Australia is the national breast cancer screening program. It aims to reduce illness and death from breast cancer through an organised approach to the early detection of breast cancer, using screening mammography to detect unsuspected breast cancer in women. Early detection provides an opportunity for early treatment, which can reduce illness and death. Women aged 40 and over are eligible for free mammograms every 2 years.

This report is the latest in the annual *BreastScreen Australia monitoring report* series. It presents the latest data available for women aged 50–74.

Breast cancer is the most common cancer affecting Australian women

Breast cancer is the most common cancer diagnosed in Australian women. In 2016, 10,756 new cases of invasive breast cancer were diagnosed in women aged 50–74, equivalent to 330 new cases per 100,000 women.

Incidence rose from around 200 new cases per 100,000 women aged 50–74 in the years before BreastScreen Australia began in 1991, to 300 cases per 100,000 in 2000. Between 2000 and 2016, incidence remained at around 300 new cases per 100,000 women.

Breast cancer is the second most common cause of cancer-related death in Australian women, behind lung cancer. In 2018, 1,423 women aged 50–74 died from breast cancer, equivalent to 42 deaths per 100,000 women.

Breast cancer mortality has decreased since BreastScreen Australia began—from 74 deaths per 100,000 women aged 50–74 in 1991 to fewer than 50 deaths per 100,000 since 2010.

More than half of targeted women participate in BreastScreen Australia

More than 1.8 million women aged 50–74—55% of the target age group—had a screening mammogram through BreastScreen Australia in 2017–2018. Participation has stayed between 54% and 55% since 2010–2011.

A small proportion of women are recalled for further investigation

In 2018, 11% of women who screened for the first time, and 4% of women attending a subsequent screen, had a screening mammogram result indicating they should be recalled for further investigation. These rates are similar to those in 2017.

More than half the cancers detected by BreastScreen Australia are small

Small breast cancers (≤15 mm in diameter) tend to be associated with more treatment options, lower morbidity and improved survival. In 2018, 46% of breast cancers detected in women attending their first screen, and 61% of breast cancers detected in those attending subsequent screens, were small. In comparison, just 28% of breast cancers detected outside BreastScreen Australia are small (AIHW 2018).

Around 2 in 5 Aboriginal and Torres Strait Islander women participated

Participation in BreastScreen Australia for Aboriginal and Torres Strait Islander women aged 50–74 was 38% in 2017–2018, compared with 54% for non-Indigenous women. Indigenous women aged 50–74 had a lower incidence rate of breast cancer than non-Indigenous women (251 compared with 303 new cases per 100,000) but a higher mortality rate (47 compared with 42 deaths per 100,000). In 2011–2015, Indigenous women aged 50–74 diagnosed with breast cancer had a 78% chance of surviving for 5 years, up from 73% in 2001–2005.

Data at a glance

Performance indicator	Number	Crude rate
Participation in 2017–2018	1,841,333	54.8%
Rescreening 2016		
After first screening round	52,598	61.6%
After second screening round	62,974	70.6%
After subsequent screening rounds	601,097	84.8%
Recall to assessment 2018		
First screening round	9,794	11.3%
Subsequent screening rounds	31,231	3.5%
Invasive breast cancer detection 2018		
First screening round	789	90.7
Subsequent screening rounds	4,851	54.8
All screening rounds	5,640	58.1
All screening rounds, small breast cancer detection	3,308	34.0
Ductal carcinoma in situ detection 2018		
First screening round	202	23.2
Subsequent screening rounds	1,182	13.4
All screening rounds	1,384	14.2
Interval cancers 2013, 2014 and 2015		
In the first year after a negative screen	1,382	6.1
In the second year after a negative screen	2,460	11.8
Program sensitivity 2013, 2014 and 2015		
In the 2 years after a negative screen	. .	76.3%
Invasive breast cancer incidence 2016	10,756	329.7
Ductal carcinoma in situ incidence 2016	1,673	51.3
Mortality 2018	1,423	42.0

Notes

1. Crude rates for 'Invasive breast cancer detection', 'Ductal carcinoma in situ detection' and 'Interval cancers' are per 10,000 women screened.
2. Crude rates for 'Invasive breast cancer incidence', 'Ductal carcinoma in situ incidence' and 'Mortality' are per 100,000 women in the population.
3. All data shown are for women aged 50–74—except for interval cancers and program sensitivity data (women aged 50–69).

COVID-19 and BreastScreen Australia

The COVID-19 pandemic has affected many areas of people's lives, including their access to and use of health services, such as cancer screening programs. The data in this report cover the period 1 January 2017 to 31 December 2018, predating the COVID-19 pandemic.

A separate Australian Institute of Health and Welfare report, *Cancer screening and COVID–19 in Australia,* examines participation in Australia's 3 national cancer screening programs between January and June 2020. This report—and future work—will provide a better understanding of the potential long-term, indirect health effects of the COVID-19 pandemic on cancer screening and outcomes.

1 Introduction

1.1 Purpose of this report

This monitoring report presents data for BreastScreen Australia, based on the current national performance indicators. To ensure that the most recent data are used for each indicator, the time frame in which each is reported can vary. In this report, the most recent participation data for BreastScreen Australia are for the period 1 January 2017 to 31 December 2018.

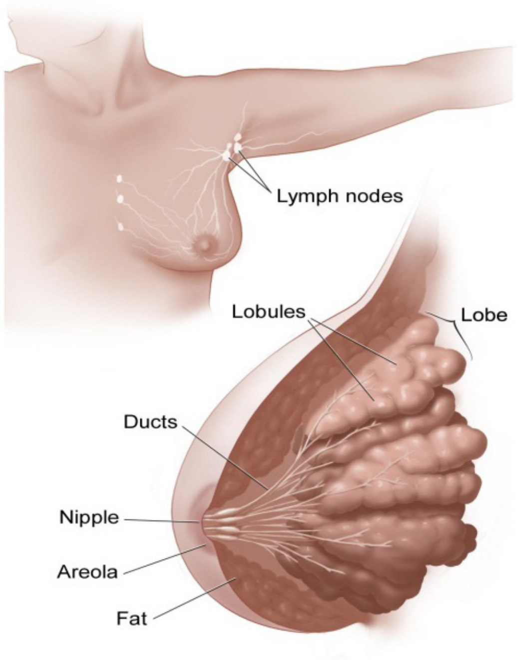
1.2 Breast cancer facts

Defining breast cancer

Cancer is a group of several hundred diseases in which abnormal cells are not destroyed naturally by the body but instead multiply and spread out of control. Cancers are distinguished from each other by the specific type of cell involved and by where in the body the disease began.

Breast cancer most commonly originates in the ducts of the breast (which carry milk from the lobules to the nipple) but can also originate in the lobules (small lobes of the breast that produce milk). More rarely, breast cancer can originate in the connective tissue of the breast. The arrangement of breast tissue is illustrated in Figure 1.1.

Figure 1.1: Anatomy of the breast and adjacent lymph nodes



Source: National Cancer Institute 2007 (see http://visualsonline.cancer.gov).

Worldwide, breast cancer is the most common cancer affecting women, representing 1 in 4 of all cancers in women. The incidence of breast cancer differs worldwide, the disease being far more common in more developed countries than in developing countries (although as less-developed countries become more developed, a shift towards the lifestyles of developed countries brings an increase in cancers that have reproductive, dietary and hormonal risk factors—of which breast cancer is one) (UICC 2014).

Breast cancer is the most commonly diagnosed cancer in Australian women, representing 28% of all female cancers diagnosed in 2016; it is second only to lung cancer in cancer deaths (AIHW 2020). Note that this cancer comparison excludes basal and squamous cell carcinoma of the skin—collectively known as non-melanoma skin cancer—as these cancers are not currently reported to Australian cancer registries.

Risk factors for breast cancer

It is not known what causes breast cancer; however, several risk factors that may increase the chance of a woman's developing breast cancer have been identified (see Box 1.1). Having a risk factor does not mean that a woman will get breast cancer—many women who have risk factors never develop the disease.

Box 1.1: Risk and protective factors for breast cancer

Breastfeeding

The only factor protective against breast cancer is breastfeeding (WCRF/AICR 2007).

Age

The greatest risk factor for breast cancer is age. Most breast cancers occur in women aged over 50—in Australia, more than three-quarters of breast cancers (AIHW 2020).

Reproductive or hormonal factors

Certain reproductive or hormonal factors may increase a woman's risk of developing breast cancer, including not having carried or given birth to any children (or to fewer children), older age at birth of first child, younger age at menarche, and older age at menopause. Oral contraception use can cause a small increase in the risk of breast cancer, as can hormone replacement therapy, which causes an increase in risk similar to that associated with late menopause (De et al. 2010; McPherson et al. 2000).

Family history and genetic susceptibility

A family history of breast cancer can increase a woman's risk, although most women who develop breast cancer do not have this—8 out of 9 women who develop it do not have a mother, sister or daughter with breast cancer (Breast Cancer Network Australia 2013).

Women with a BRCA1 or BRCA2 mutation (see Glossary) have a higher risk of developing breast cancer than the general population in all age groups. Women who carry a fault in BRCA1 or BRCA2 have a lifetime high risk of breast cancer: in a recent study, the cumulative breast cancer risk to age 80 was 72% for women who carry a fault in BRCA1 and 69% for women who carry a fault in BRCA2 (Kuchenbaecker et al. 2017).

Other factors

Other risk factors associated with breast cancer include a higher body mass index, exposure to X-rays and gamma radiation, and consumption of alcoholic beverages (Cancer Research UK 2014).

A family history can be split into 3 categories (Cancer Australia 2015):

1. ‘At or slightly above average risk’ covers more than 95% of the female population, and includes women with no family history as well as women with a weak family history (such as having 1 first degree relative diagnosed with breast cancer at age 50 or older). Nine out of 10 women in this group will not develop breast cancer.
2. ‘Moderately increased risk’ covers less than 4% of the female population and includes women with a strong family history (for instance, 1 first degree relative diagnosed with breast cancer under the age of 50).
3. ‘Potentially high risk’ covers less than 1% of the female population, and includes women with a very strong family history (for instance, 2 first or second degree relatives on one side of the family diagnosed with breast or ovarian cancer plus 1 of a range of additional factors on the same side of the family, such as an additional breast cancer diagnosed before the age of 40, or breast cancer in a male relative).

See *Advice about familial aspects of breast cancer and epithelial ovarian cancer: a guide for health professionals* (Cancer Australia 2015) for more information on assessing individual risk.

Although most breast cancers occur in women over the age of 50, younger women, and men of any age, can, and do, get breast cancer (see Box 1.2).

Box 1.2: People of all ages can develop breast cancer

As women aged 40 and over are eligible for breast cancer screening through BreastScreen Australia, these women are the focus of this report. Even though screening mammography is not recommended for women aged under 40, young women can (and do) develop breast cancer as can men of any age, though more rarely. It is important, therefore, for people of all ages to be aware of how their breasts normally look and feel and promptly report any new or unusual changes to their general practitioner.

For more information on breast cancer diagnosed in women aged under 40, see *Breast cancer in young women: key facts about breast cancer in women in their 20s and 30s* (AIHW 2015); see http://breastcancerinmen.canceraustralia.gov.au for more information on breast cancer in men.

1.3 Breast cancer screening

Recommended by Cancer Australia as a population-based screening tool, mammography is the only means of screening shown to reduce breast cancer mortality (Cancer Australia 2009). In screening mammography, 2 views are taken of each breast; radiologists then study the images, looking for suspicious characteristics that require further investigation. Screening mammography, like screening tests used in other screening programs, is not intended to be diagnostic; rather, it aims to identify people who are more likely to have cancer, and therefore require further investigation from diagnostic tests.

Screening mammograms work well in older women as breasts become less dense as women age, particularly after menopause. This is why mammograms become more effective as women get closer to age 50. Incidence of breast cancer is also much higher in older women, with more than 75% of breast cancers occurring in women aged 50 and over (AIHW 2020).

Mammographic screening is not recommended for women younger than 40 as breast tissue in pre-menopausal women tends to be dense, which can make it difficult to correctly identify the presence of breast cancer by this means. The reduced accuracy of mammography in younger women has a high risk of false positive and false negative results, potentially resulting in high numbers of both unnecessary investigations and missed breast cancers (Irwig et al. 1997).

BreastScreen Australia

In Australia, population-based breast cancer screening is available through BreastScreen Australia, which targets women aged 50–74 for 2-yearly screening mammograms. Women aged 40–49 and 75 and over are also eligible to attend but are not actively targeted.

BreastScreen Australia is a joint program of the Australian and state and territory governments, first established in 1991. It aims to reduce morbidity and mortality from breast cancer using screening mammograms to detect unsuspected breast cancers in women who have no symptoms and therefore would not otherwise know they had the disease. Detection of breast cancers at an early stage allows access to diagnostic and treatment services early, so that women can benefit most from available treatments.

A recent Australian Institute of Health and Welfare (AIHW) data linkage study demonstrated the benefits of breast screening. It found that breast cancers detected through BreastScreen Australia had a 54% to 63% lower risk of causing death than breast cancers diagnosed in women who had never screened through BreastScreen Australia (AIHW 2018).

Lower morbidity from breast cancer is achieved by detecting cancers when they are small, as small breast cancers tend to be associated with increased treatment options (NBOCC 2009). Research shows that 59% of breast cancers detected by BreastScreen Australia are small, compared with just 28% of breast cancers detected outside BreastScreen Australia (AIHW 2018). Further, treatment of breast cancers detected by BreastScreen Australia is more likely to involve breast-conserving surgery (74%, compared with 56% outside the program) (NBOCC 2009), which is associated with decreased morbidity.

Mortality reduction from breast cancer screening is also due to the detection of breast cancers when they are small, as it has been shown that finding breast cancers when they are small leads to improved survival (AIHW & NBCC 2007). In 2009, in a comprehensive evaluation of BreastScreen Australia, it was estimated that breast cancer mortality had been reduced by 21–28% as a result of breast cancer screening (BreastScreen Australia EAC 2009). Further, analysis of data from the Swedish Two-Country Trial and England's breast cancer screening program estimated that, respectively, 8.8 and 5.7 breast cancer deaths per 1,000 women screened were prevented by screening (Duffy et al. 2010).

In 2015, the International Agency for Research on Cancer conducted a full review of available high-quality observational studies to ensure that the evidence compiled in 2002—which showed a reduction in mortality as a result of screening mammography (IARC 2002)—was still relevant today. The study determined that women aged 50–69 who attended breast cancer screening using screening mammography had about a 40% reduction in the risk of death from breast cancer, with a substantial reduction in the risk of death also observed in women aged 70–74 (Lauby-Secretan et al. 2015). These mortality benefits align with the women targeted by BreastScreen Australia (that is, those aged 50–74).

For more information about BreastScreen Australia, see Appendix B.

Box 1.3: ‘Overdiagnosis’ of breast cancer by BreastScreen Australia

The following points are from Cancer Australia’s position statement on ‘overdiagnosis’:

1. A majority of breast cancers found through screening would be progressive and would become symptomatic within a woman’s lifetime if left untreated.
2. It is likely that some screen-detected breast cancers (ductal carcinoma in situ or invasive breast cancer) might never have progressed to become symptomatic in a woman’s lifetime. Detection of these cancers is sometimes referred to as ‘overdiagnosis’.
3. It is not possible to precisely predict at diagnosis to which cancers overdiagnosis would apply.
4. Research is needed, including molecular and genomic research, to find means of identifying cancers that would be of minimal risk of progression and therefore could be managed more conservatively.

For further information, see the position statement endorsed by the Australian Health Ministers’ Advisory Council Standing Committee on Screening, Cancer Council Australia, and the Royal Australian and New Zealand College of Radiologists, and supported by the Cancer Australia Advisory Council: https://www.canceraustralia.gov.au/publications-and-resources/position-statements/overdiagnosis-mammographic-screening (Cancer Australia 2014).

Monitoring BreastScreen Australia

The performance of a population-based cancer screening program such as BreastScreen Australia needs to be assessed as it relates to the underlying aims of the program. At the national level, this is achieved by reporting data against a series of performance indicators to allow screening outcomes to be monitored, and positive and negative trends identified early.

This report presents national data for BreastScreen Australia, using performance indicators developed and endorsed by the former National Screening Information Advisory Group and by jurisdictional BreastScreen programs.

Data for performance indicators 1–6 (*Participation, Rescreening, Recall to assessment, Invasive breast cancer detection, DCIS detection* and *Sensitivity*) are sourced from the BreastScreen register in each state and territory. These data are compiled into national figures by the Australian Institute of Health and Welfare (AIHW) to allow national monitoring of BreastScreen Australia.

For more information about the data sources used in this report, see Appendix C.

Expenditure on BreastScreen Australia

In Australia, screening is recommended for 3 cancers: breast, cervical and bowel. Each cancer has a national screening program, with both Australian Government and state and territory government components.

The Australian Government provides funding to the states and territories for public health services through National Health Reform Payments (known as National Specific Purpose Payments before 1 July 2012) and National Partnership Payments. State and territory governments have full discretion over the application of National Health Reform Payments for public health funding, including the amount expended on BreastScreen Australia and the National Cervical Screening Program (NCSP). The National Bowel Cancer Screening Program is funded through a specific National Partnership Payment.

Table A1.1 shows expenditure for the 3 national cancer screening programs (expenditure by Australian, state and territory governments combined) for the 2017–18 financial year.

In 2017–18, an estimated $264.8 million was spent on BreastScreen Australia (Table A1.1).

2 Picture of breast cancer in Australia

2.1 Number of new cases

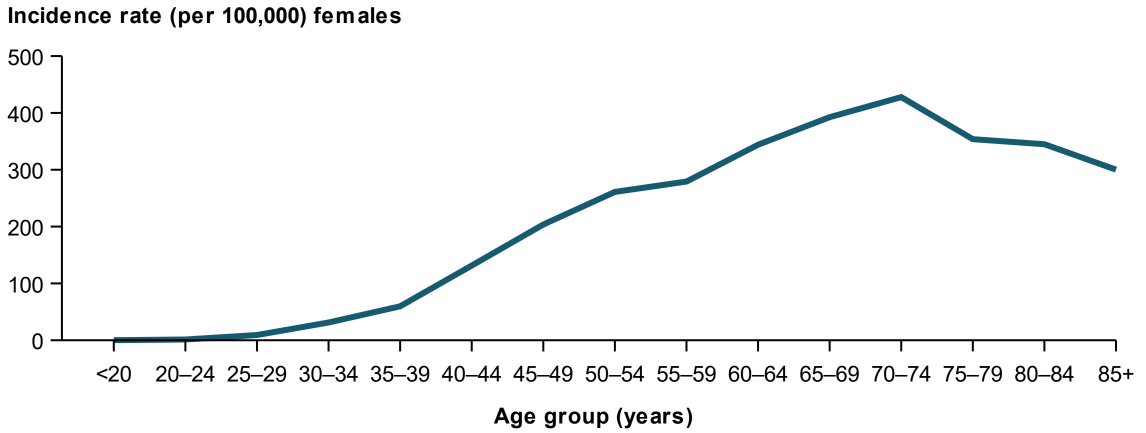
In 2016, there were 17,354 new cases of breast cancer diagnosed in women in Australia, equivalent to 125.8 new cases per 100,000 women when age-standardised (Table A3.37). Of these 17,354 new cases, 62% (10,756) were in women aged 50–74, equivalent to 324.5 new cases per 100,000 women when age-standardised.

Breast cancer is the most commonly diagnosed cancer in Australian women. Note that this cancer comparison excludes basal and squamous cell carcinoma of the skin—collectively known as non-melanoma skin cancer—as these cancers are not currently reported to Australian cancer registries.

Target age group (50–74 years)	All ages
10,756 new cases in 2016 324.5 new cases per 100,000 target-age women	17,354 new cases in 2016 125.8 new cases per 100,000 women

In 2016, breast cancer incidence increased with age, from 131.4 new cases per 100,000 women for women aged 40–44 to 427.8 for women aged 70–74. Breast cancer incidence decreased to 300.2 per 100,000 for women aged 85 and over (Figure 2.1).

Figure 2.1: Age-specific incidence rates of breast cancer in females, by age group, Australia, 2016



Notes

1. Age-specific rates are expressed per 100,000 females.
2. Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016. Data for this figure are available in Table A3.38.

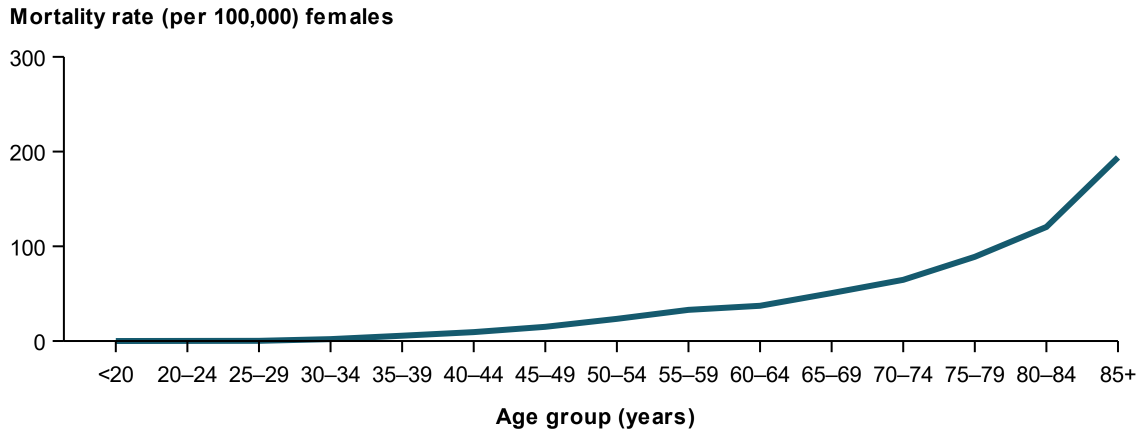
2.2 Number of deaths

In 2018, there were 2,999 deaths from breast cancer in Australia, equivalent to an age-standardised rate of 19.1 deaths per 100,000 women (Table A3.53). Of these 2,999 deaths, about half (47% or 1,423) occurred in women aged 50–74, which is an age-standardised rate of 40.4 deaths per 100,000 women.

Target age group (50–74 years)	All ages
1,423 deaths in 2018 40.4 deaths per 100,000 target-age women	2,999 deaths in 2018 19.1 deaths per 100,000 women

In 2018, breast cancer mortality increased with age, from 10.1 deaths per 100,000 women for women aged 40–44, to 199.4 per 100,000 for women aged 85 and over (Figure 2.2).

Figure 2.2: Age-specific mortality rates from breast cancer in females, by age group, Australia, 2018



Note: Age-specific rates are expressed per 100,000 females.

Source: AIHW National Mortality Database. Data for this figure are available in Table A3.54.

Breast cancer in Australian women is second only to lung cancer in cancer deaths (AIHW 2020).

2.3 Survival

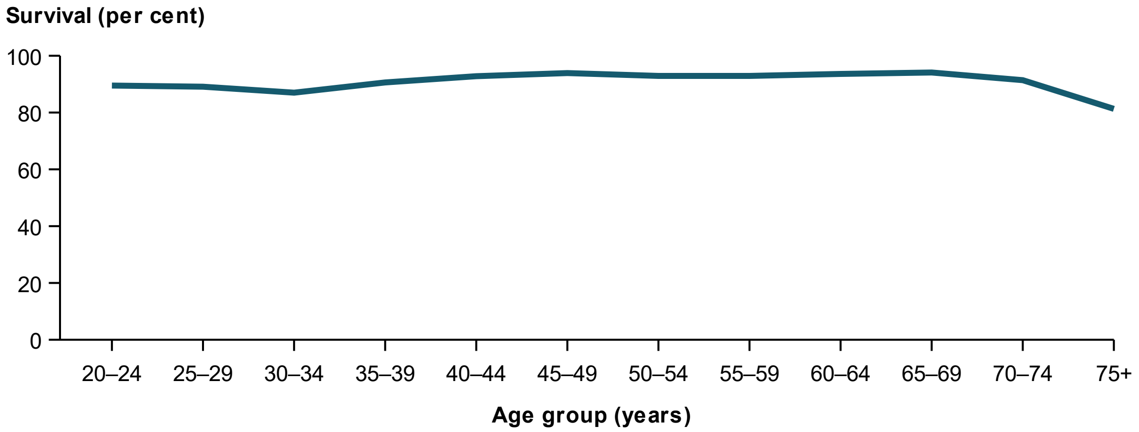
Survival in this report refers to 'relative survival'; that is, survival figures reflect the probability of being alive for a given amount of time after a cancer diagnosis, compared with the general population, and reflects the impact of a cancer diagnosis.

Between 2012 and 2016, women diagnosed with breast cancer in Australia had a 91.1% chance of surviving for 5 years, compared with their counterparts in the general population (Table A2.1). For the target age group (50–74), 5-year relative survival was 93.1%.

Target age group (50–74 years)	All ages
93.1% 5-year relative survival (2012–2016)	91.1% 5-year relative survival (2012–2016)

Between 2012 and 2016, the 5-year survival rate from breast cancer was highest for women aged 50–74, followed by women aged 20–39 (Table A2.1). Women aged 75 and over had a lower chance of surviving for 5 years, with a 5-year relative survival rate of 81.3% (Figure 2.3).

Figure 2.3: Five-year relative survival from breast cancer, by age group, 2012–2016



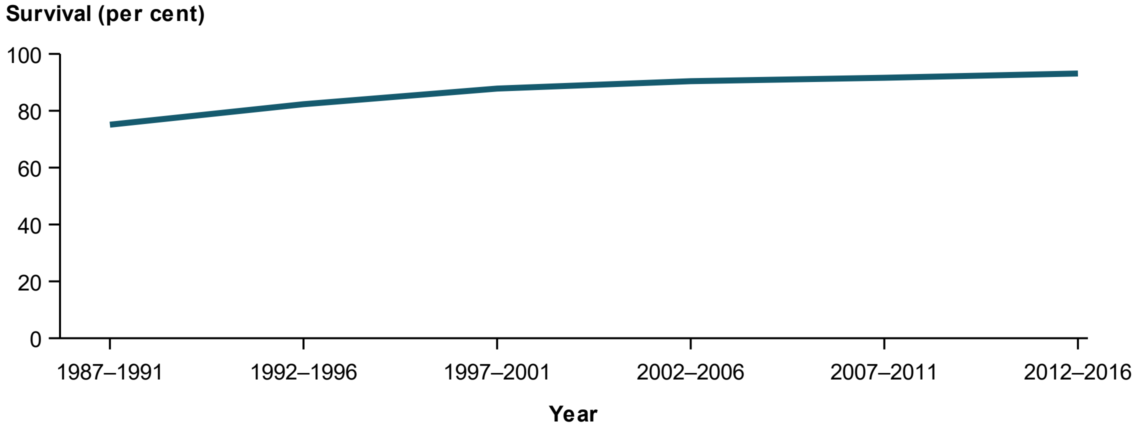
Note: Relative survival was calculated with the period method, using the period 2012–2016 (Brenner & Gefeller 1996). Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016. Data for this figure are available in Table A2.1.

Survival over time

Survival from breast cancer for women aged 50–74 has improved over time. Between 1987–1991 and 2012–2016, the 5-year relative survival rate rose from 75.1% to 93.1% (Figure 2.4).

Figure 2.4: Trends in 5-year relative survival from breast cancer in women aged 50–74, 1987–1991 to 2012–2016



Note: Relative survival was calculated with the period method, using the period 2012–2016 (Brenner & Gefeller 1996). Data for 2016 are estimated for the Northern Territory.

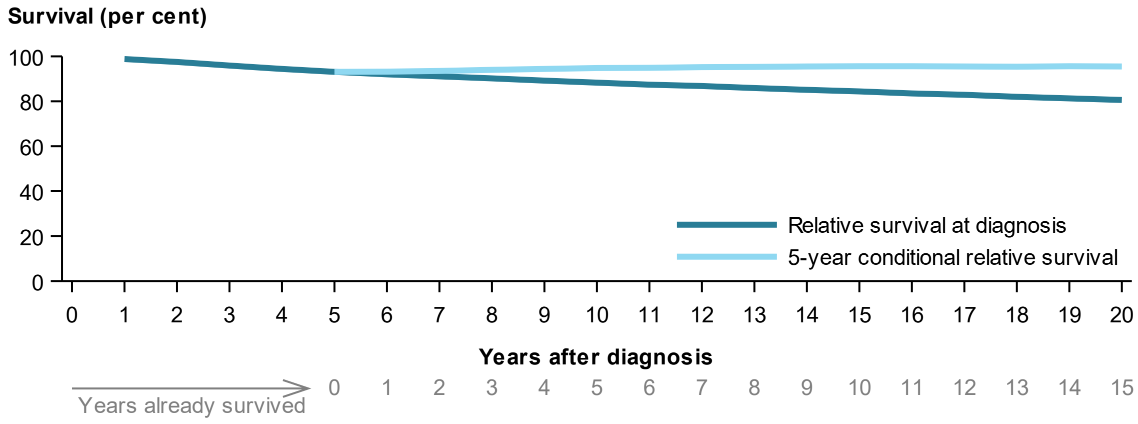
Source: AIHW Australian Cancer Database 2016. Data for this figure are available in Table A2.2.

Conditional survival is the probability of surviving a given number of years provided that an individual has already survived a specified amount of time after diagnosis.

Between 2012 and 2016, when women aged 50–74 were first diagnosed with breast cancer, they had a 93.1% chance of surviving for at least 5 years after diagnosis compared with the general population (Figure 2.5). For those women who had already survived 5 years after being diagnosed with breast cancer, the chance of surviving for at least another 5 years (5-year conditional relative survival) was around 95%.

For information about breast cancer survival among Indigenous women, see Section 5.3 ‘Indigenous Australians’.

Figure 2.5: Relative survival at diagnosis and 5-year conditional survival from breast cancer in women aged 50–74, 2012–2016



Note: Relative survival was calculated with the period method, using the period 2012–2016 (Brenner & Gefeller 1996). Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016. Data for this figure are available in Table A2.3.

Prevalence of breast cancer

Prevalence is the number of people alive after a diagnosis of cancer. It is related to incidence and survival: if incidence and survival are both high, prevalence will be high; if incidence and survival are both low, prevalence will be low.

At the end of 2015, there were 47,240 women aged 50–74 alive who had been diagnosed with breast cancer in the previous 5 years and 82,835 who had been diagnosed in the previous 10 years (Table 2.1).

Table 2.1: Prevalence of breast cancer in women, by age group, Australia, end of 2015

Age group (years)	5-year prevalence	10-year prevalence
<40	2,511	3,147
40–44	3,751	5,150
45–49	6,535	9,537
50–54	9,210	14,756
55–59	9,099	16,443
60–64	9,584	16,669
65–69	10,716	19,015
70–74	8,631	15,952
75–79	5,914	10,995
80–84	3,805	7,050
85+	4,158	7,543
All ages	**73,914**	**126,257**
Ages 50–74	**47,240**	**82,835**

Note: Prevalence refers to the number of living people previously diagnosed with cancer, not the number of cancer cases.

Source: AIHW Australian Cancer Database 2016.

2.4 Burden of breast cancer

Burden of disease analysis measures the combined impact of fatal and non-fatal impacts of ill health.

More than merely counting deaths or disease prevalence, it takes into account age at death and severity of disease. Burden of disease analysis quantifies the gap between a population's actual health and an ideal level of health in a given year—that is, every individual living in full health for an ideal life span.

This section presents data on the burden of cancer based on the Australian Burden of Disease Study (ABDS) 2015. The ABDS 2015 provides Australia-specific burden of disease estimates best matched to the Australian context for the total 2015 population. In the ABDS 2015, the cancer and other neoplasms disease group also includes the impact of benign, in situ and uncertain neoplasms. See *Australian Burden of Disease Study: impact and causes of illness and death in Australia 2015* (AIHW 2019a) for more information.

Data are presented for the fatal burden, non-fatal burden and the total burden. Fatal burden, expressed as years of life lost (YLL), measures the years lost between the age at which people die and the remaining life expectancy in an ideal life span, based on the current best life expectancy across the world. YLL are influenced by both the number of deaths and the ages at which the deaths occur.

Non-fatal burden, expressed as years lived with disability (YLD), measures the years of healthy life lost due to living with a disease in a given year. Total YLD are influenced by the number of people with each disease, the duration of its effects and how severe those effects are.

The total burden, expressed as disability-adjusted life years (DALY), is the sum of YLL and YLD. One DALY is 1 year of 'healthy life' lost due to premature death or living with the effects of an illness or injury. The more DALY associated with a disease, the greater the burden.

Cancer was a major cause of illness in Australia: in 2015, cancer was the disease group with the highest burden—18% of the total disease burden. Most (93%) of the burden from cancer was due to dying prematurely, with only a small proportion (7.4%) due to living with a cancer diagnosis (AIHW 2019a).

Breast cancer was the leading cause of cancer burden for females in 2015, with 69,690 DALY, accounting for 18% of the total cancer burden for females. It was the third-leading cause of cancer burden for persons, at 8.1% (AIHW 2019a). Breast cancer was responsible for around one-quarter of the cancer burden in women aged 25–44 (7,862 DALY; 23%) and 45–64 (33,653 DALY; 23%). Cervical and ovarian cancers also caused considerable burden in these age groups.

The rankings for breast cancer according to the 3 measures that comprise burden of disease are shown in Table 2.2.

Table 2.2: Leading causes of cancer burden (DALY), leading causes of fatal cancer burden (YLL), and leading causes of non-fatal cancer burden (YLD), females, 2015

	Disability-adjusted life years (DALY)		Years of life lost (YLL)		Years lived with disability (YLD)	
Rank	**Cancer type**	**% of DALY**	**Cancer type**	**% of YLL**	**Cancer type**	**% of YLD**
1	Breast cancer	18.2	Lung cancer	18.1	Breast cancer	32.2
2	Lung cancer	17.1	Breast cancer	17.0	Bowel cancer	9.7
3	Bowel cancer	11.0	Bowel cancer	11.1	Melanoma of the skin	4.7
4	Pancreatic cancer	5.6	Pancreatic cancer	5.9	Lung cancer	4.6
5	Ovarian cancer	4.8	Ovarian cancer	4.9	Ovarian cancer	3.7
6	Brain and CNS cancer	3.8	Brain and CNS cancer	3.9	Uterine cancer	3.2
7	Unknown primary	3.4	Unknown primary	3.5	Non-Hodgkin lymphoma	2.6
8	Melanoma of the skin	3.0	Liver cancer	3.0	Myeloma	2.4
9	Liver cancer	2.8	Melanoma of the skin	2.9	Brain and CNS cancer	2.4
10	Non-Hodgkin lymphoma	2.7	Non-Hodgkin lymphoma	2.8	NMSC	2.3
	Leading 10 cancers	**72.4**	**Leading 10 cancers**	**73.2**	**Leading 10 cancers**	**67.8**
	All other cancers	*27.6*	*All other cancers*	*26.8*	*All other cancers*	*32.2*
	Total	**100.0**	**Total**	**100.0**	**Total**	**100.0**

CNS = central nervous system lymphoma; NMSC = non-melanoma skin cancer.

Source: AIHW 2019a.

3 Performance indicators

3.1 Summary

BreastScreen Australia has been monitored since 1996–1997 using national performance indicators, which are key measures of the progress BreastScreen Australia is making towards reducing morbidity and mortality from breast cancer. These performance indicators were developed and endorsed by the former National Screening Information Advisory Group and by jurisdictional BreastScreen programs.

Figure 3.1 summarises the performance indicator data in this report, according to the stages of the Population Based Screening Framework (Standing Committee on Screening 2016). These 5 incremental stages are recruitment, screening, assessment, diagnosis and outcomes.

Detailed results for each of these performance indicators are provided in Sections 3.3–3.7.

Recruitment

In 2017–2018, 1,841,333 women aged 50–74 participated in BreastScreen Australia, a participation rate of 54.8% of the eligible population (Figure 3.1). Among women aged 50–72 who screened in 2016, about 4 in 5 (81.1%) rescreened within 27 months.

Screening and assessment

Among women who participated in BreastScreen Australia in 2018, 11.3% of those who attended their first screen, and 3.5% of those attending a subsequent screen, were recalled to attend an assessment for further investigation (Figure 3.1).

Diagnosis

In 2018, 5,640 women aged 50–74 were diagnosed with invasive breast cancer by BreastScreen Australia, which equates to a rate of 58.1 per 10,000 (Figure 3.1). Of those, 3,308 or 58.7% had a small (≤15 mm) cancer, a rate of 34.0 per 10,000 women aged 50–74.

There were 1,384 women aged 50–74 diagnosed with ductal carcinoma in situ (DCIS) by BreastScreen Australia in 2018, a rate of 14.2 per 10,000.

For women aged 50–69 who participated in screening in 2013, 2014 and 2015, the rate of interval cancers detected within 24 months after a negative screening episode was 8.8 per 10,000 (for all screening rounds combined).

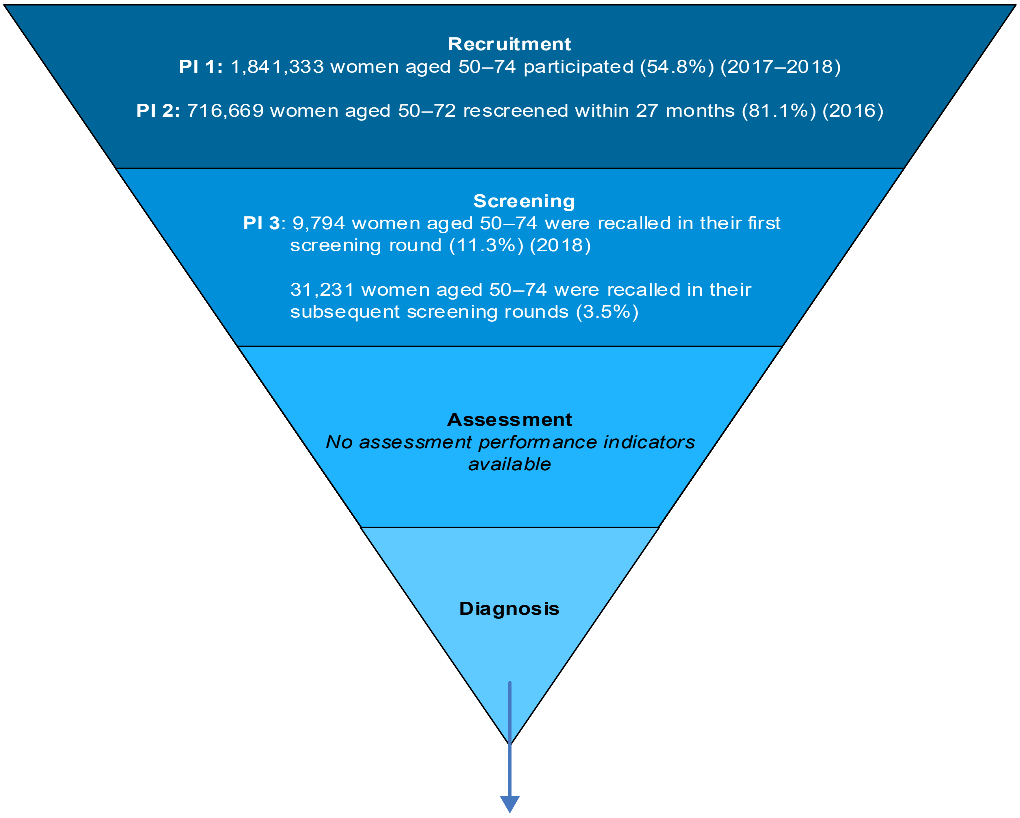
For women aged 50–69 who screened in 2013–2015, program sensitivity in the 2 years after a negative screen was 76.3% (in all rounds). This is the proportion of invasive breast cancers detected by BreastScreen Australia out of all invasive breast cancers in program-screened women (interval and screen-detected cancers).

Outcomes

In Australia, there were 10,756 new cases of breast cancer diagnosed in women aged 50–74 in 2016, a crude rate of 329.7 per 100,000 (Table A3.37 and Figure 3.1). There were 1,673 new cases of DCIS in women aged 50–74, or 51.3 per 100,000 (Table A3.51 and Figure 3.1).

In 2018, there were 1,423 deaths from breast cancer among women aged 50–74 in Australia, a rate of 42.0 per 100,000 (Table A3.53 and Figure 3.1).

Figure 3.1: Summary of BreastScreen Australia performance indicators for this report



Recruitment

PI 1: 1,841,333 women aged 50–74 participated (54.8%) (2017–2018)

PI 2: 716,669 women aged 50–72 rescreened within 27 months (81.1%) (2016)

Screening

PI 3: 9,794 women aged 50–74 were recalled in their first screening round (11.3%) (2018)

31,231 women aged 50–74 were recalled in their subsequent screening rounds (3.5%)

Assessment

No assessment performance indicators available

Diagnosis

PI 4: 5,640 women aged 50–74 diagnosed with breast cancer (58.1 per 10,000) (2018)

3,308 women aged 50–74 diagnosed with small cancer (≤15 mm) (34.0 per 10,000)

58.7% of all cancers diagnosed were small cancers (≤15 mm)

PI 5: 1,384 women aged 50–74 diagnosed with DCIS (14.2 per 10,000) (2018)

PI 6a: Interval cancer rate was 8.8 per 10,000 in women aged 50–69 (2013–2015)

PI 6b: Program sensitivity was 76.3% in women aged 50–69 (2013–2015)

Outcomes

PI 7a: Breast cancer incidence 329.7 per 100,000 (2016)

PI 7b: DCIS incidence 51.3 per 100,000 (2016)

PI 8: Mortality 42.0 per 100,000 (2018)

PI = performance indicator.

Notes

1. Participation PI 1 is reported for the 2-year calendar period 2017–2018. Rescreening PI 2 is reported for the index year 2016. Recall to assessment PI 3, invasive breast cancer detection PI 4 and DCIS detection PI 5 are reported for 2018. Interval cancer PI 6a and program sensitivity PI 6b are reported for the index years 2013, 2014 and 2015. Breast cancer incidence PI 7a and DCIS incidence PI 7b are reported for 2016. Mortality PI 8 is reported for 2018.
2. All rates are crude rates. For age-standardised rates, see the relevant tables in Appendix A.

Sources: AIHW analysis of BreastScreen Australia data; AIHW Australian Cancer Database; AIHW National Mortality Database.

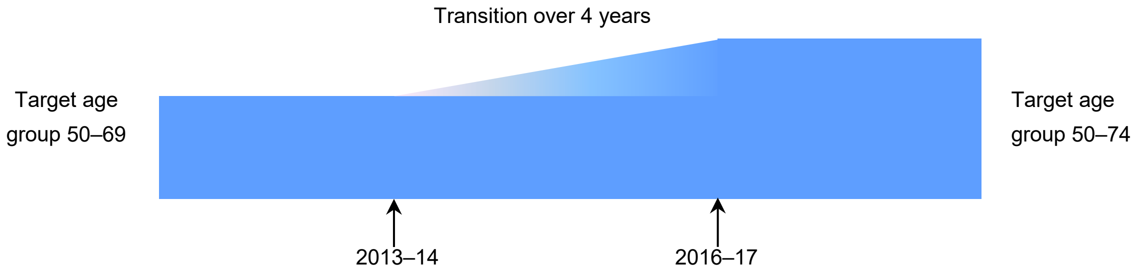
3.2 Women aged 50–74 now targeted by BreastScreen Australia

As part of the 2013–14 Federal Budget, the Australian Government committed $55.7 million over 4 years to expand BreastScreen Australia's target age range from 50–69 to 50–74, resulting in a change to the age group actively targeted for 2-yearly screening mammograms.

Therefore, from 1 July 2013 women aged 70–74 were actively targeted by BreastScreen Australia, along with women aged 50–69.

Both the funding and the targeting activities associated with increasing the target age range by 5 years were phased in over several years, and fully implemented by 2016–17. This meant that participation of women aged 70–74 was likely to increase until 2016–17, and thereafter be relatively stable (as illustrated in Figure 3.2).

Figure 3.2: Transition of the target age range of BreastScreen Australia, from women aged 50–69 to women aged 50–74, between the financial years 2013–14 and 2016–17



More recently, the 2017–18 Federal Budget announced funding of $64.3 million over the next 4 years, from 2017–18 to 2020–21, to enable BreastScreen Australia to continue to actively invite women aged 70–74 to screen for the early detection of breast cancer.

Reporting on women aged 50–74

Each performance indicator will be reported using the new target age group when its reporting period reaches 2014. This approach is detailed in Box 3.1.

Box 3.1: Reporting on BreastScreen Australia's new target age group of 50–74

The new target age group of 50–74 years will be included in indicator reporting as follows:

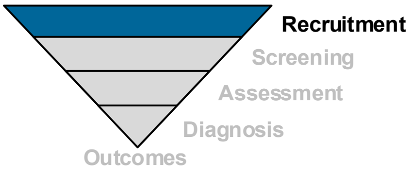
Participation: for women screened in the 2 years 2014–2015, onwards.

Recall to assessment, invasive breast cancer detection and DCIS: for women screened in the year 2014, onwards.

Rescreening, interval cancers and program sensitivity: for women screened in the index year 2014 and onwards (noting that at least 27 months need to have passed after the index year to know if a woman rescreened or had an interval cancer detected).

This means that in the current report:

- the target age group of 50–74 is reported for *Participation, Rescreening, Recall to assessment, Invasive breast cancer detection, DCIS detection*, *Incidence* and *Mortality*
- the target age group of 50–69 is reported for *Interval cancers* and *Program sensitivity*.



3.3 Recruitment

Performance indicator 1: Participation

Summary

- 1,841,333 women aged 50–74 participated in BreastScreen Australia in 2017–2018, equivalent to a participation rate of 54.8%.
- Participation remained steady between 54% and 57% (age-standardised) for women aged 50–69 for most of the years between 1996–1997 and 2017–2018.

Definition

The percentage of women aged 50–74 who are screened through BreastScreen Australia in a 2-year period.

Rationale

Participation is a major indicator of the performance of BreastScreen Australia, which aims to maximise the early detection of breast cancer in the target population, women aged 50–74. High attendance for screening for women in this age group maximises the reduction in mortality from breast cancer (BreastScreen Australia 2004).

Guide to interpretation

Participation is measured over 2 years to align with the 2-year recommended screening interval, as most women will screen only once within a 2-year period. A consequence of measuring participation over 2 years on an annual basis is that there are ‘rolling’ participation rates, in which there is an overlap of 1 calendar year between any 2 consecutive rates. Because of this, the participation rate for a 2-year reporting period is often compared with the previous non-overlapping rate. Participation is based on the number of women screened, not the number of screening mammograms performed.

Data are presented for women aged 50–74, the target age group since 1 July 2013, as well as for women aged 40–49, 50–69 and 75+ where appropriate.

As the BreastScreen Australia targeted age group was expanded from 50–69 to 50–74 from 1 July 2013, historical data are presented for women aged 50–69 to enable comparability over time.

The most recent participation data are for women who had a screening mammogram in 2017 and 2018.

Results

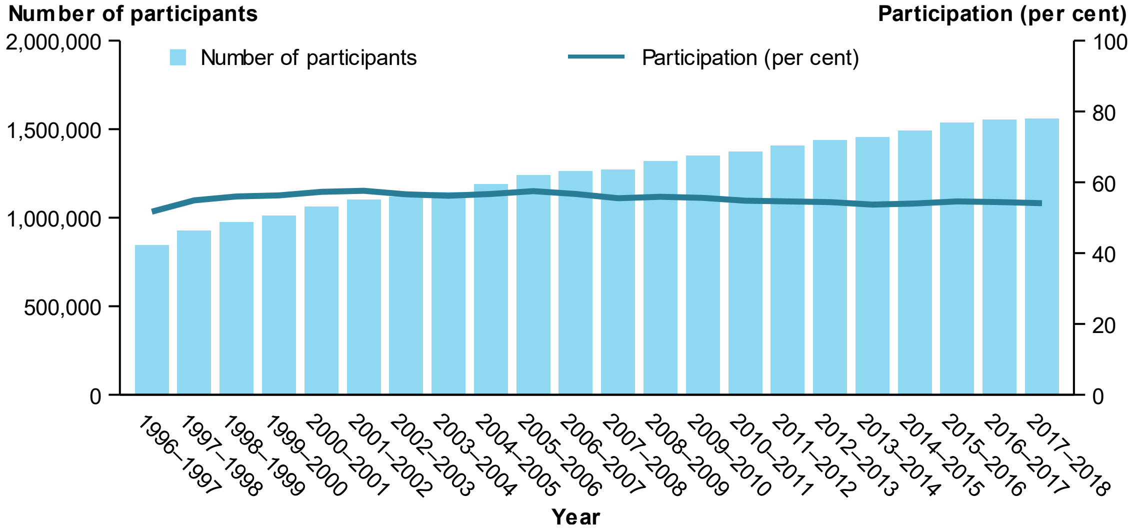
In 2017–2018, a total of 2,142,939 women participated in BreastScreen Australia, of whom, 1,841,333 (85.9%) were aged 50–74. This is equivalent to a participation rate of 54.8% among women aged 50–74 (Table A3.3).

Trends

The participation rate among women aged 50–69 has remained relatively stable over time. The age-standardised participation rate has been between 54% and 57% for most of the years between 1996–1997 (when reporting began) and 2017–2018 (Figure 3.3).

While participation has remained steady, the number of participants has increased. In 2017–2018, a total of 1,560,982 women aged 50–69 participated in BreastScreen Australia, compared with 2015–2016 (the previous non-overlapping 2-year period) when 1,537,437 women aged 50–69 participated (Figure 3.3).

Figure 3.3: Participation of women aged 50–69 in BreastScreen Australia, 1996–1997 to 2017–2018



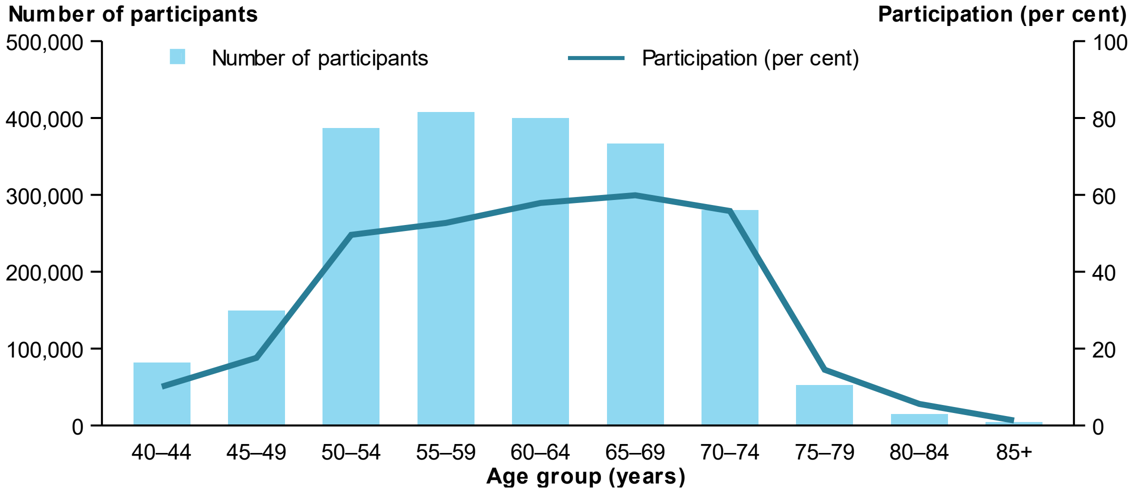
Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.1.

Age

In 2017–2018, of the women aged 40 and over who participated in BreastScreen Australia, participation was highest in the target age group of 50–74. This is in line with the aim of BreastScreen Australia to maximise the proportion of women in the target age group who are screened every 2 years (Figure 3.4). Furthermore, the proportion of women participating in all 5-year age groups within the target age group was equal to or above 49.6%, peaking at 59.9% in women aged 65–69. The participation rates outside the target age group were lower, at 14.0% for women aged 40–49 and 7.6% for women aged 75 and over.

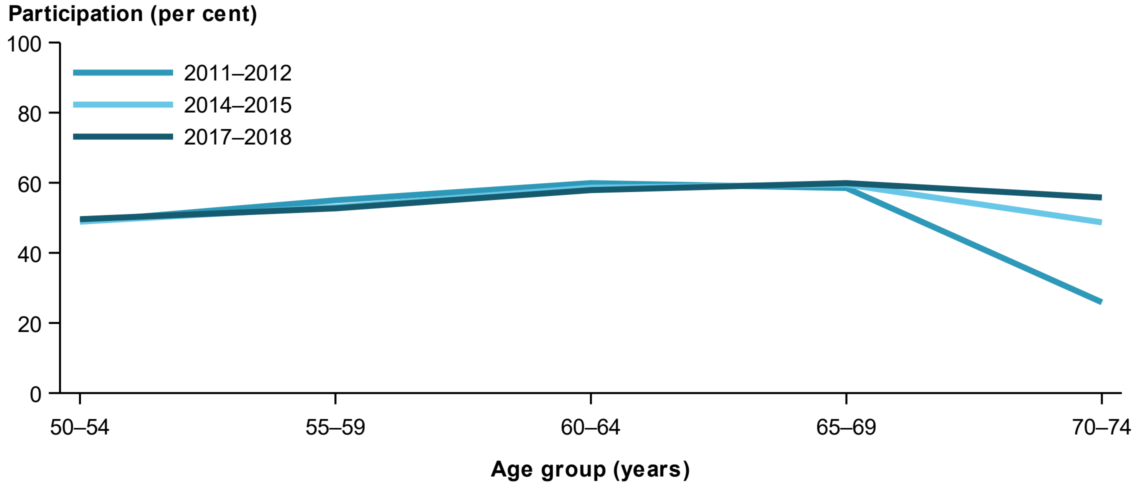
With the addition of women aged 70–74 to the target age group, the number of women screening in this age group increased substantially, from 97,957 in 2011–2012 (the last reporting period that did not include any data from 1 July 2013) to 280,351 in 2017–2018. This equated to a rise in the participation rate of women aged 70–74, from 25.9% in 2011–2012 to 55.8% in 2017–2018; all years in between showed an increase relative to the proportion of the 2-year reporting period for which this age group was actively targeted (Figure 3.5). At 55.8%, the participation rate of women aged 70–74 is now higher than the participation rates of women aged 50–54 and 55–59.

Figure 3.4: Participation in BreastScreen Australia by age group, 2017–2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.2.

Figure 3.5: Participation trends for women aged 50–74, 2011–2012, 2014–2015 and 2017–2018



Source: AIHW analysis of BreastScreen Australia data.

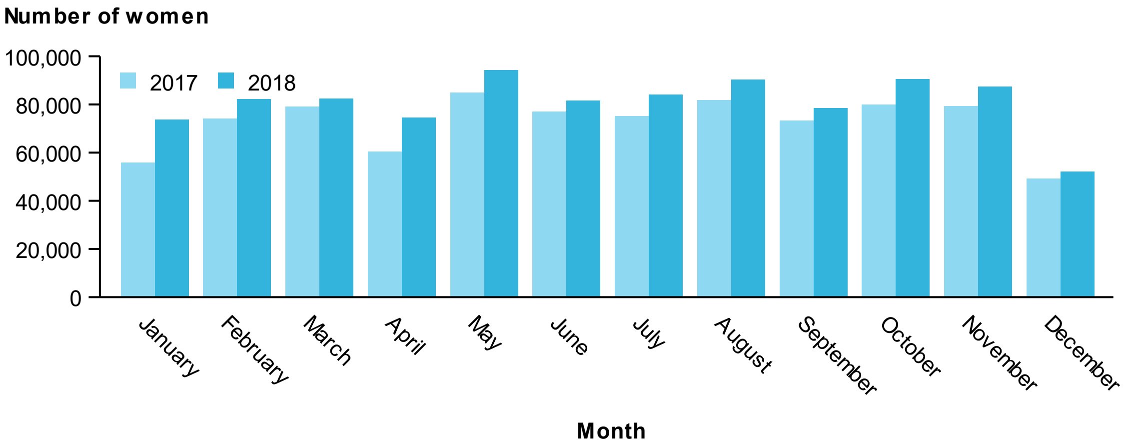
State and territory

In 2017–2018, among the states and territories, the age-standardised participation rate for women aged 50–74 ranged from 38.4% to 59.3% (Table A3.3).

Month

The number of women participating in BreastScreen Australia each month in 2017 and 2018 followed a similar pattern (Figure 3.6). In both years, the highest number of women screened through BreastScreen Australia in May; the lowest numbers screened in January and December. This shows that participation tended to be lower in months with national holidays.

Figure 3.6: Number of women aged 50–74 participating in BreastScreen Australia by month, 2017 and 2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.4.

Remoteness area

In 2017–2018, the age-standardised participation rates for women aged 50–74 were highest in *Outer regional* areas and *Inner regional* areas at 57.2% and 56.8%, respectively, followed by women living in *Major cities* and *Remote* areas, both at 53.2% (Figure 3.7). The participation rate was lowest for women living in *Very remote* areas at 43.3%.

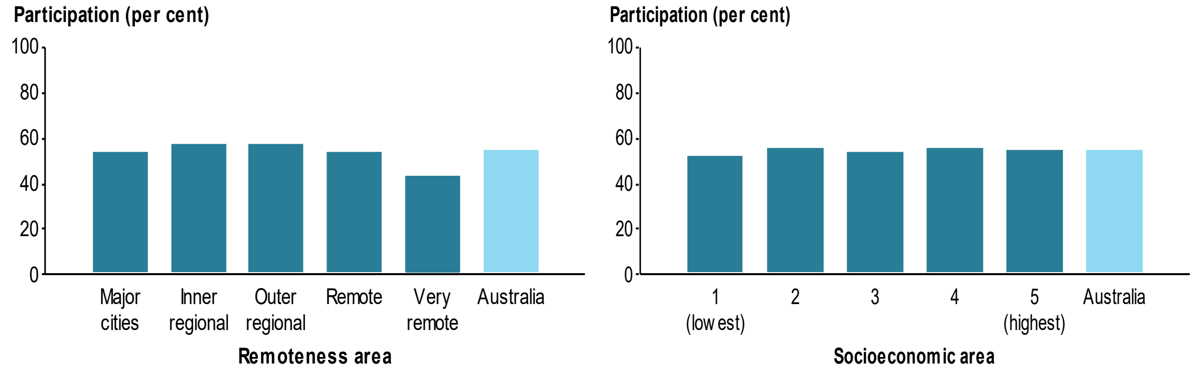
Socioeconomic area

In 2017–2018, there was little variation in participation for women aged 50–74 across socioeconomic areas, with all areas having an age-standardised participation rate between 52.1% and 55.2% (Figure 3.7).

Main language spoken at home

In 2017–2018, the age-standardised participation rate for women aged 50–74 who spoke a language other than English at home was 45.4%, compared with 56.3% for women who spoke English at home (Table A3.7).

Figure 3.7: Participation of women aged 50–74 in BreastScreen Australia, by remoteness area, and by socioeconomic area, 2017–2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in tables A3.5 and A3.6.

Indigenous status

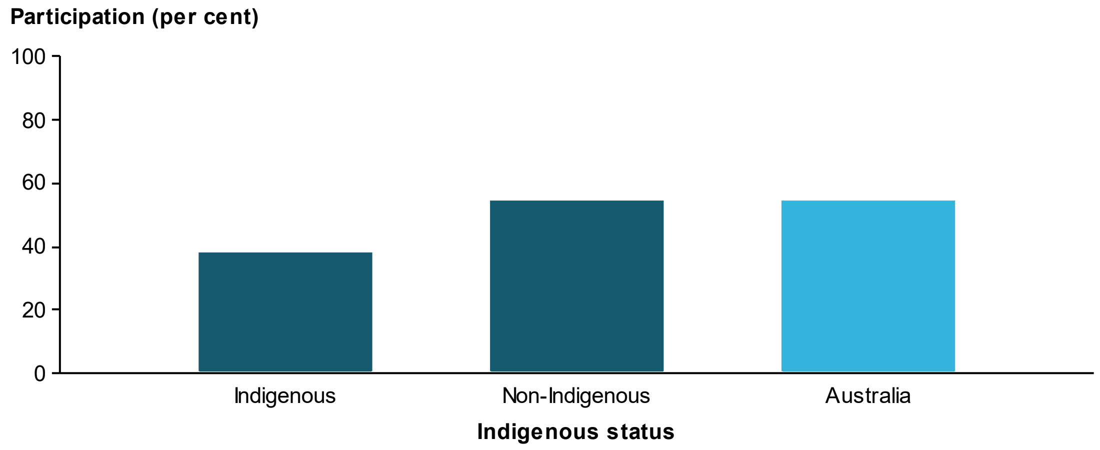
In 2017–2018, a total of 30,430 Indigenous women aged 40 and over participated in BreastScreen Australia. Of these, 24,001 were aged 50–74, which equates to a crude participation rate of 37.3% (Table A3.8).

In 2017–2018, the age-standardised participation rate of Indigenous women aged 50–74 in BreastScreen Australia was 37.6%, compared with the non-Indigenous participation rate of 54.4% (Figure 3.8).

The crude participation rate of Indigenous women aged 50–69 increased from 25.0% in 1996–1997 to 37.1% in 2017–2018—although Indigenous women have always had a lower participation rate than non-Indigenous women (Figure 3.9). The lower participation rate of Indigenous women may reflect a decreased opportunity to screen compared with non-Indigenous women. There may also be a level of under-reporting of Indigenous status in BreastScreen data (as Indigenous status is self-reported by women at the time of their screen), which would also have the effect of lowering the participation rate.

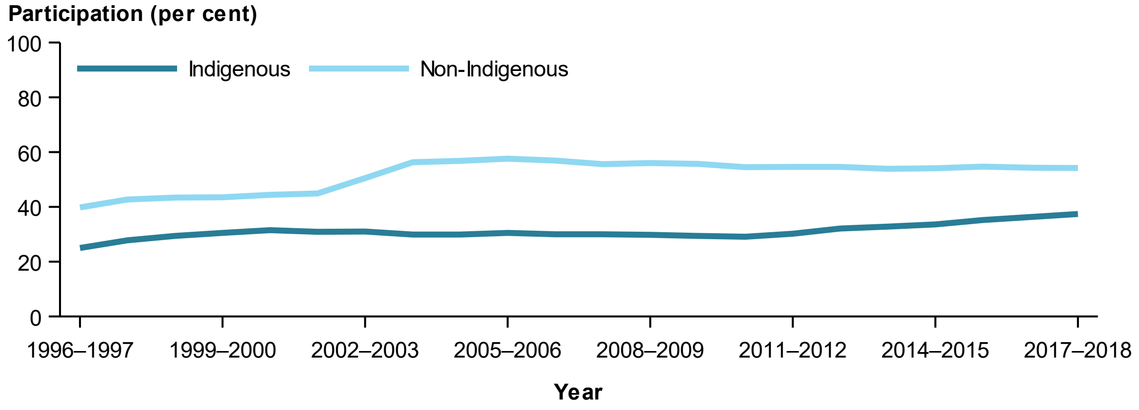
In 2017–2018, the crude participation rate for Indigenous women aged 50–74 was highest for those living in *Inner regional* areas (41.4%) (Table A3.13).

Figure 3.8: Participation of women aged 50–74 in BreastScreen Australia, by Indigenous status, 2017–2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.8.

Figure 3.9: Participation of women aged 50–69 in BreastScreen Australia, by Indigenous status, 1996–1997 to 2017–2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.14.

Information on participation in BreastScreen Australia 2014–2015 to 2017–2018 can be found on the AIHW website at https://www.aihw.gov.au/reports/cancer-screening/national-cancer-screening-programs-participation/data.

BreastScreen Australia and National Accreditation Standards (NAS) Measures

Box 3.2: BreastScreen Australia and National Accreditation Standards

The provision of a high-quality service to women is of great importance to BreastScreen Australia. For this reason, services accredited under BreastScreen Australia are expected to operate according to the National Accreditation Standards (NAS) Measures of BreastScreen Australia, along with national policy features and protocols. The accreditation system, of which the NAS Measures are an integral part, intends to drive continuous quality improvement in the delivery of breast screening services, to ensure women receive safe, effective and high-quality care.

The BreastScreen Australia NAS Measures have been developed to ensure that all women receive breast screening services of a consistently high quality, regardless of where they attend for screening or assessment.

A number of NAS Measures are consistent with the performance indicators in this report and, —where appropriate, the data in this report are benchmarked against these Measures. These benchmarks are useful in interpreting the data presented, although in considering how these national data compare with the NAS Measures, it should be noted that the NAS Measures were not designed to be used as standards for the BreastScreen Australia performance indicators.

National Accreditation Standard (NAS) Measures related to participation

Access to BreastScreen services—especially for women from Indigenous, culturally and linguistically diverse, rural/remote, and lower socioeconomic backgrounds—is a national policy feature of BreastScreen Australia, which has developed National Accreditation Standards (NAS) Measures to ensure that this policy feature is met by services accredited through BreastScreen Australia.

These NAS Measures (along with other NAS Measures related to access and participation in BreastScreen Australia) underpin BreastScreen Australia's aim to maximise the proportion of women in the target population who are screened every 2 years.

Table 3.1 shows the NAS Measures related to participation. While NAS Measures for women aged 50–74 do not yet have a target, BreastScreen Australia aims to maximise the participation of women in the target age groups for screening.

Table 3.1: NAS Measures for participation calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2020*

NAS Measure		Value (crude rate)
NAS Measure 1.1.1(a)	The Service and/or SCU monitors and reports the participation rate of women aged 50–74 years who participate in screening in the most recent 24-month period.	54.8%
NAS Measure 1.2.1(a)	The Service and/or SCU monitors and reports participation of women aged 50–74 years from special groups and where rates are below that of the overall population, implements specific strategies to encourage their participation in screening. Consideration of equitable participation rates of at least the following groups is made: women from Indigenous, culturally and linguistically diverse, rural/remote and lower socioeconomic backgrounds.	
	Indigenous	37.3%
	Non-English-speaking	45.8%
	Remote/Very remote	53.5%/43.2%
	SES group (lowest)	52.9%
NAS Measure 1.2.2(a)	The Service and/or SCU monitors the proportion of all women screened aged 40–49 years and 75 years and over.	
	40–49	14.0%
	75+	7.6%

Source: AIHW analysis of BreastScreen Australia data.

Performance indicator 2: Rescreening

Summary

- The proportion of women aged 50–72 who screened in 2016 and rescreened within 27 months was 60.6% after the first screening round, 68.2% after the second screening round, and 84.5% after the third and subsequent screening rounds.
- In 2016, regardless of the screening round, the highest rescreen rates were for women aged 50–72, followed by women aged 40–49. Women aged 75 and over had the lowest rescreen rate.

Definition

The proportion of women aged 50–72 screened in a given year whose screening outcome was a recommendation to return for screening in 2 years and who returned for a screen within 27 months.

Rationale

A high rescreen rate is important to increase the likelihood of breast cancers being detected early and to maintain overall participation.

Guide to interpretation

The screening interval of 27 months is used instead of the recommended screening interval of 2 years to allow for potential delays in screening availability and data transfer.

Note that although the BreastScreen Australia target age group is 50–74, only women aged 50–72 are reported for the rescreen rate because women aged 73–74 at the time of their screen would be outside the target age group of 50–74 when they are due for their rescreen.

As the BreastScreen Australia targeted age group was expanded from 50–69 to 50–74 from 1 July 2013, historical data are presented for women aged 50–67 to enable comparability over time.

The most recent rescreening data are for women screened in the index year 2016. This small lag in data availability is due to the fact that 27 months needs to have passed since a woman's last screen to know whether or not she has rescreened within this interval.

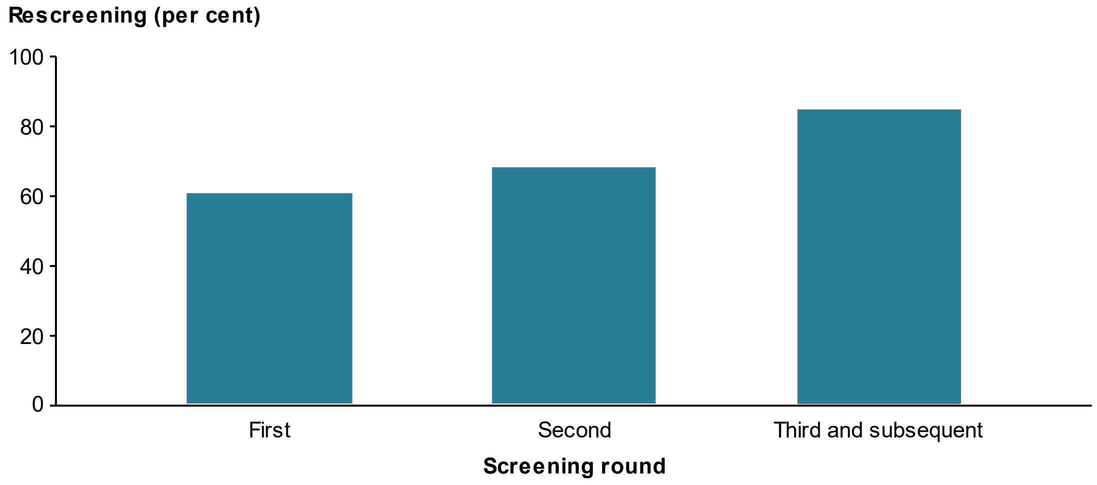
More information on rescreening

The rescreening indicator measures the proportion of women who return for screening at a BreastScreen service within the recommended screening interval. The interval between the screens is an important factor influencing the level of cancer detection. BreastScreen Australia national policy states that women should be screened every 2 years. It has been shown that screening intervals longer than 2 years reduce mortality benefits from screening and result in an increase in interval cancers (BreastScreen Australia 2004). This is because increased time between screening may allow a tumour to grow to the point where symptoms become evident, thus eliminating the advantage of screening.

Results

The proportion of women aged 50–72 who screened in 2016 and rescreened within 27 months was 60.6% after the first screening round (that is, a woman's first screen with BreastScreen Australia), 68.2% after the second screening round, and 84.5% after the third and subsequent screening rounds (Figure 3.10). This indicates that the proportion of women aged 50–72 who return for a rescreen within 27 months increases with the number of screens previously attended.

Figure 3.10: Rescreening by screening round, women aged 50–72 screened during 2016



Note: Rates are the number of women rescreening within 27 months as a percentage of women screened and age-standardised to the population of women attending a BreastScreen service in 2008.

Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.17.

Trend

Between 2006 and 2016, rescreening for women aged 50–67 increased, regardless of the screening round. For the first screening round, the proportion of women aged 50–67 who were screened in 2006 and returned within 27 months was 49.9%, increasing to 60.1% for women screened in 2016 (Table A3.15). For the second screening round, over the same period, this increase was from 58.5% to 68.3%. The third and subsequent screening rounds follow the same trend, with an increase from 73.5% to 84.4%.

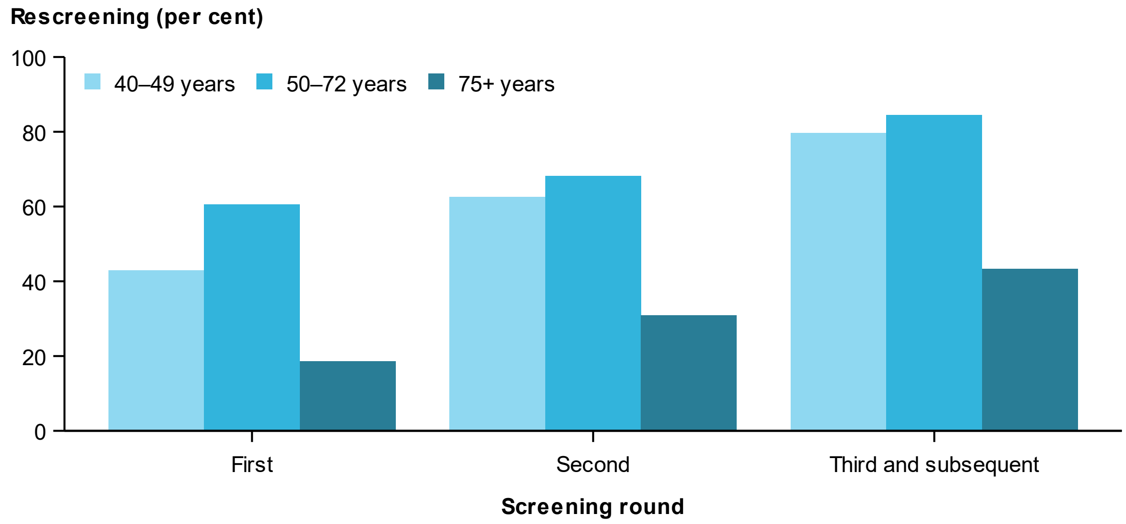
Age

In 2016, regardless of the screening round, the highest rescreen rate was for women aged 50–72, followed by women aged 40–49 (Figure 3.11). Women aged 75 and older had the lowest rescreen rate.

State and territory

In 2016, although there was some variation, all states and territories followed the national trend of increasing rescreen rates with increased number of screens previously attended (Table A3.17).

Figure 3.11: Rescreening by screening round, women aged 40–49, 50–72 and 75+ screened in 2016



Note: Rates are the number of women rescreening within 27 months as a percentage of women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.16.

National Accreditation Standard (NAS) Measures related to rescreening

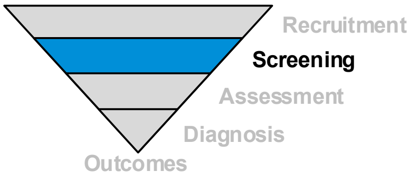
Table 3.2 shows the NAS Measures related to rescreening. While NAS Measures for women aged 50–74 do not yet have a target, BreastScreen Australia aims to maximise the participation of women in the target age groups for rescreening.

See Box 3.2 for information on the National Accreditation Standards.

Table 3.2: NAS Measures for rescreening calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2020*

NAS Measure		Value (crude rate)
NAS Measure 1.1.2(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–72 years who attend for their first screening episode within the Program and who are rescreened within 27 months.	61.6% first
NAS Measure 1.1.3(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–72 years who attend for their second and subsequent screen within the Program who are rescreened within 27 months of their previous screening episode.	70.6% second 84.8% subsequent

Source: AIHW analysis of BreastScreen Australia data.



3.4 Screening

Performance indicator 3: Recall to assessment

Summary

- In 2018, the age-standardised recall to assessment rate for women aged 50–74 was higher in the first screening round at 11.2% than in subsequent screening rounds at 3.5%.

Definition

The proportion of women aged 50–74 screened in a given year who are recalled for assessment.

Rationale

Women are recalled to assessment for further investigation if their screening mammogram is found to be suspicious for breast cancer. BreastScreen Australia aims to maximise the number of cancers detected while minimising the number of unnecessary investigations.

Guide to interpretation

Recall to assessment is disaggregated into first and subsequent screening rounds because a woman is more likely to be recalled to assessment the first time she visits a BreastScreen service than at subsequent visits. This is for 2 reasons: firstly, a woman is more likely to have an invasive breast cancer detected on her first visit, and, secondly, with no previous images against which to compare the images from her first screening mammography, it is more difficult to distinguish between what is normal and what might be suspicious (BreastScreen WA 2008).

Changes to recall to assessment rates should be considered alongside corresponding invasive cancer detection rates, as a higher recall to assessment rate may be considered acceptable if it leads to higher breast cancer detection rates.

As the BreastScreen Australia targeted age group was expanded from 50–69 to 50–74 from 1 July 2013, historical data are presented for women aged 50–69 to enable comparability over time.

The most recent recall to assessment data are for women screened in the index year 2018.

More information on recall to assessment

A woman is recalled to assessment for mammographic reasons because her screening mammography images are found to be suspicious for breast cancer.

Assessment of women recalled involves further investigation at the assessment centre. This may include palpation, diagnostic mammography, ultrasound and, if required, a percutaneous biopsy (fine needle aspiration for cytological assessment or core biopsy of breast tissue for histological assessment).

Results

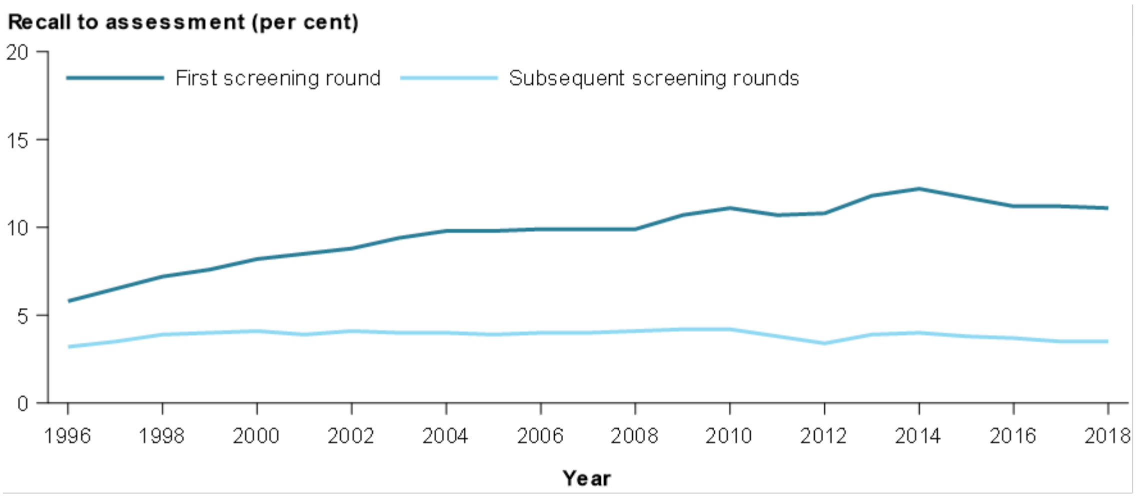
In 2018, the recall to assessment rate for women aged 50–74 was higher in the first screening round than in subsequent screening rounds. Of the 86,965 women aged 50–74 who attended their first screening round, 9,794 were recalled to assessment, which equates to an age-standardised rate of 11.2% (Table A3.20). Of the 884,552 women aged 50–74 who attended subsequent screening rounds, 31,231 were recalled to assessment, which equates to an age-standardised rate of 3.5%.

Trends

The recall to assessment rate for the first screening round, for women aged 50–69, remained steady between 2004 and 2008 at around 10% (Figure 3.12), before increasing to 11–12% from 2009 onwards.

Over the same period, the recall to assessment rate for subsequent screening rounds for women aged 50–69 ranged between 3.4% and 4.2% (Figure 3.12).

Figure 3.12: Recall to assessment, women aged 50–69, first and subsequent screening rounds, 1996–2018



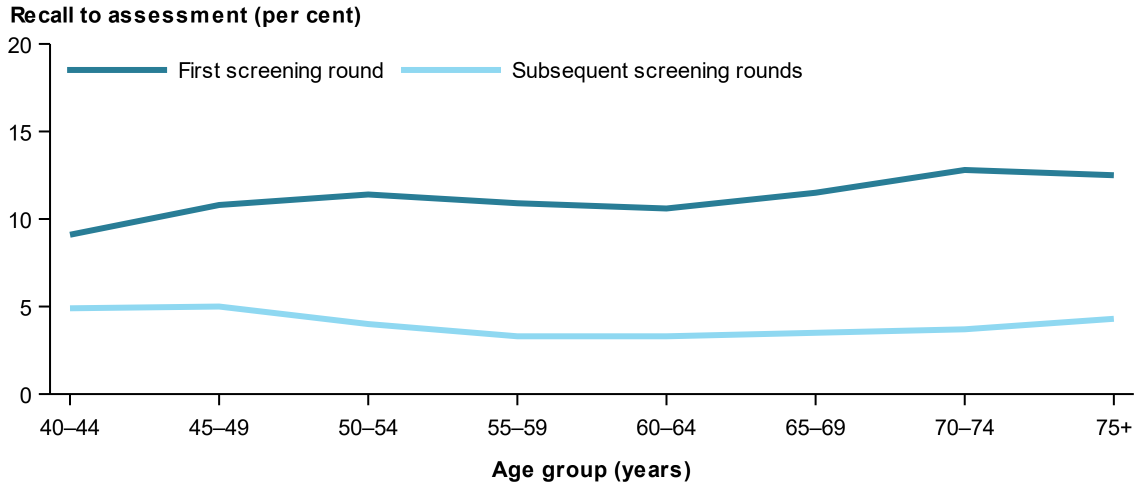
Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.18.

Age

In 2018, the proportion of women attending their first screen who were recalled to assessment for further investigation was between 10.6% and 12.8% for all age groups 45 years and over; women aged 40–44 had a lower recall rate of 9.1% (Figure 3.13).

This pattern differed for women attending subsequent screens, for whom the proportions recalled to assessment were highest for women aged 40–44 and 45–49, at 4.9% and 5.0%, respectively, followed by women aged 50–54 and 75 and over at 4.0% and 4.3%, respectively. Women aged 55–74 were least likely to be recalled after a subsequent screen, with recall rates ranging between 3.3% and 3.7% (Figure 3.13).

Figure 3.13: Recall to assessment, by age group, first and subsequent screening rounds, 2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.19.

State and territory

In 2018, the recall to assessment rates for women aged 50–74 attending their first screen varied across the states and territories, from 9.1% to 13.9% (Table A3.20). The corresponding rates for women aged 50–74 attending subsequent screens varied from 3.1% to 5.4%.

National Accreditation Standard (NAS) Measures related to recall to assessment

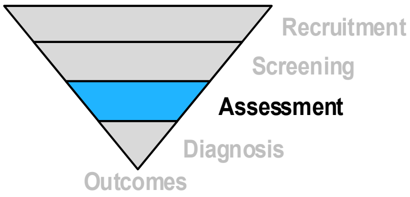
Table 3.3 shows the NAS Measures related to recall to assessment. While NAS Measures for women aged 50–74 do not yet have a target, BreastScreen Australia aims to minimise the number of women who are recalled when they do not have breast cancer (false positives).

See Box 3.2 for information on the National Accreditation Standards.

Table 3.3: NAS Measures for recall to assessment calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2020*

NAS Measure		Value (crude rate)
NAS Measure 1.2.2(b)	The Service and/or SCU monitors the proportion of all women recalled for assessment aged 40–49 years and 75 years and over. 40–49 75+	5.0% to 9.9% 4.3% to 12.5%
NAS Measure 2.6.3(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their first screening episode and are recalled for assessment.	11.3%
NAS Measure 2.6.4(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their second or subsequent screening episode and are recalled for assessment.	3.5%

Source: AIHW analysis of BreastScreen Australia data.



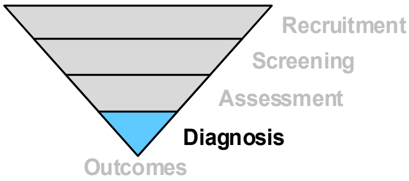
3.5 Assessment

There are no performance indicators to report for assessment.

The majority of women who participate in BreastScreen Australia experience only the screening test, as nothing suspicious is seen on the screening mammogram. However, a subset of women are recalled for further investigation of a mammographic abnormality or symptom reported at screening.

Testing at assessment can include:

- clinical assessment—physical examination including palpation (assessment by touch)
- diagnostic mammography—detailed x-rays that use specialised techniques to investigate symptoms or signs
- ultrasound—this diagnostic method is based on the reflection of ultrasonic sound waves to generate a picture of the breast tissue
- percutaneous biopsy—a small sample of tissue that is taken from the suspicious area for testing. May consist of fine needle aspiration for cytological assessment or core biopsy of breast tissue for histological assessment.



3.6 Diagnosis

Performance indicator 4: Invasive breast cancer detection

Summary

- 6,511 women were diagnosed with an invasive breast cancer by BreastScreen Australia in 2018, of whom 5,640 (86.6%) were aged 50–74.
- 3,308 women aged 50–74 were diagnosed with a small (≤15 mm) invasive breast cancer.
- 58.7% of all invasive breast cancers in women aged 50–74 were small (≤15 mm).

Definition

The number of women aged 50–74 with invasive breast cancer detected through BreastScreen Australia per 10,000 women screened. The rate is reported for breast cancers of all sizes, as well as for a subset of breast cancers that are small, having a diameter less than or equal to 15 mm (≤15 mm).

Rationale

The aim of BreastScreen Australia is to reduce morbidity and mortality from breast cancer. This can be achieved by detecting cases of unsuspected breast cancer before women have symptoms, enabling early intervention. BreastScreen Australia aims to maximise the detection of invasive breast cancers, particularly small cancers, to achieve the desired reductions in morbidity and mortality.

Guide to interpretation

Detection of invasive breast cancers is disaggregated into first and subsequent screening rounds because a woman is more likely to have a breast cancer detected the first time she visits a BreastScreen service than in subsequent visits. This is because a woman’s first visit detects prevalent cancers that may have been present for some time rather than incident cancers that have grown between screens (Kavanagh et al. 1999). Detection of small invasive breast cancers is presented for all screening rounds combined.

As the BreastScreen Australia targeted age group was expanded from 50–69 to 50–74 from 1 July 2013, historical data are presented for women aged 50–69 to enable comparability over time.

The most recent breast cancer detection data are for women screened in the index year 2018.

Results

In 2018, 6,511 women were diagnosed with an invasive breast cancer by BreastScreen Australia. Of these women, 5,640 (86.6%) were aged 50–74 (Table A3.25).

Among the 5,640 women aged 50–74 who were diagnosed with an invasive breast cancer in 2018, 789 were attending their first screen (equivalent to 113.5 women diagnosed per 10,000 women screened when age-standardised), and 4,851 were attending a subsequent screen (equivalent to 49.5 women diagnosed per 10,000 women when age-standardised) (Table A3.25).

In 2018, of the 5,640 women aged 50–74 who were diagnosed with an invasive breast cancer, 3,308 had a small (≤15 mm) cancer diagnosed. This equates to 34.0 per 10,000 women screened (31.5 per 10,000 women when age-standardised) (Table A3.25).

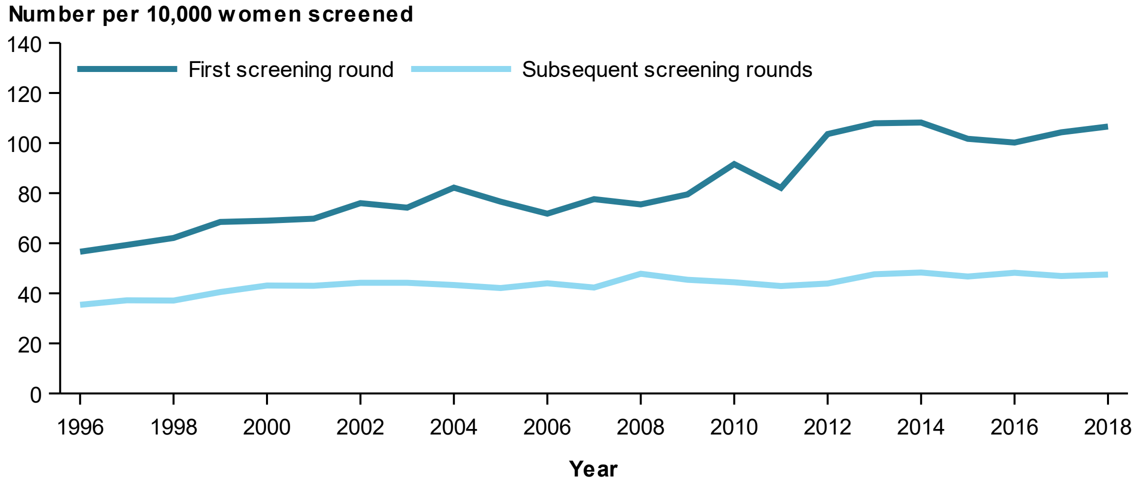
In 2018, 58.7%, of all invasive breast cancers in women aged 50–74 were small (≤15 mm) (Table A3.25).

Trends

Between 2008 and 2018, there was an overall increase in the age-standardised invasive breast cancer detection rate for women aged 50–69 for their first screening round. The rate per 10,000 women screened was lowest at 75.5 new cases detected in 2008, and highest at 108.2 in 2014. There were 106.6 new cases detected per 10,000 women in 2018 (Figure 3.14).

Over the same period, the equivalent rate for subsequent screening rounds per 10,000 women was lowest at 42.9 new cases detected in 2011, and highest at 48.3 in 2014. There were 47.5 new cases detected per 10,000 women aged 50–69 in 2018.

Figure 3.14: Invasive breast cancer detection (all sizes), women aged 50–69, first and subsequent screening rounds, 1996 to 2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.21.

Small cancers

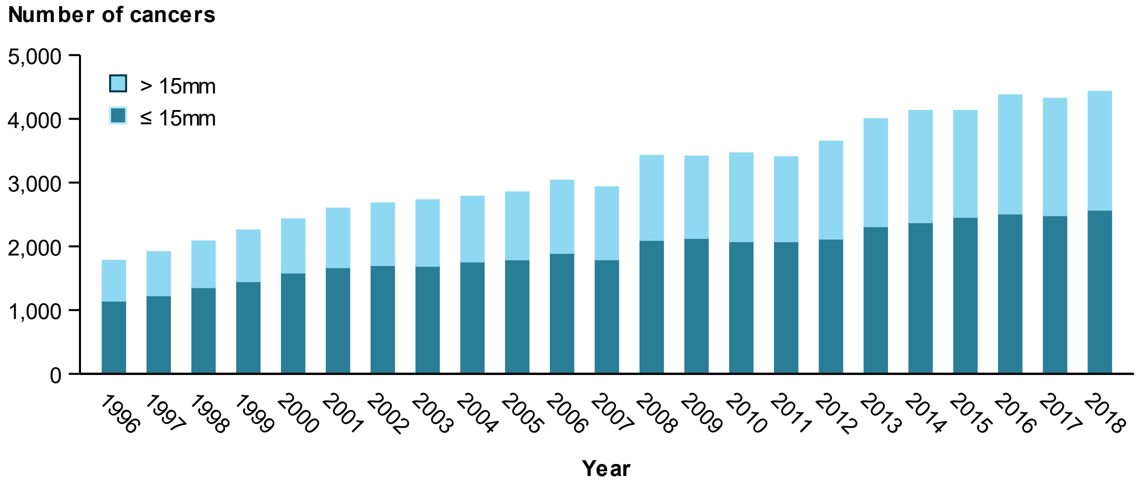
In 2018, for every 10,000 women aged 50–74 screened through BreastScreen Australia, 34.0 had a small (≤15 mm) invasive breast cancer detected (Table A3.25). As a proportion of all invasive breast cancers detected through BreastScreen Australia in women aged 50–74, 45.8% were small in women attending their first screen and 60.8% in women attending subsequent screens. For all screening rounds combined, 58.7% of all breast cancers detected were small.

A woman is more likely to be diagnosed with a small cancer in subsequent screening visits than at her first visit, since her first screening mammogram detects prevalent cancers that might have been present for some time, whereas subsequent screens detect incident cancers that have grown between screens (Kavanagh et al. 1999). Because they have had less time to grow, incident cancers are more likely to be small. In contrast, invasive breast cancers detected at a first screen are less likely to be small because they are prevalent cancers that have had more time to grow.

Although the proportion of small breast cancers detected has fallen over time for women aged 50–69—from around 65% of all invasive breast cancers between 1996 and 2001 to 57.8% in 2018 (Figure 3.15)—it is still of note that more than half of all invasive breast cancers detected through BreastScreen Australia are small, at ≤15 mm. The high proportion of small breast cancers is a positive outcome, because small breast cancers tend to be associated with increased treatment options (NBOCC 2009) and improved survival (AIHW & NBCC 2007). Invasive breast cancers detected outside BreastScreen Australia are less likely to be small, with only 28% measuring ≤15 mm (AIHW 2018).

In 2018, the proportion of small invasive breast cancers was lower in younger age groups, comprising 43.9% of cancers detected for women aged 40–49, compared with 58.7% for women aged 50–74 and 55.7% for women aged 75 and over (Table A3.23). The lower proportion of small invasive cancers in young women may be related to greater breast density in younger women, which makes small invasive breast cancers difficult to visualise with screening mammography (Irwig et al. 1997).

Figure 3.15: Number of invasive breast cancers, showing the proportion of small (≤15 mm) to other sizes (>15 mm), detected in women aged 50–69, all screening rounds, 1996 to 2018

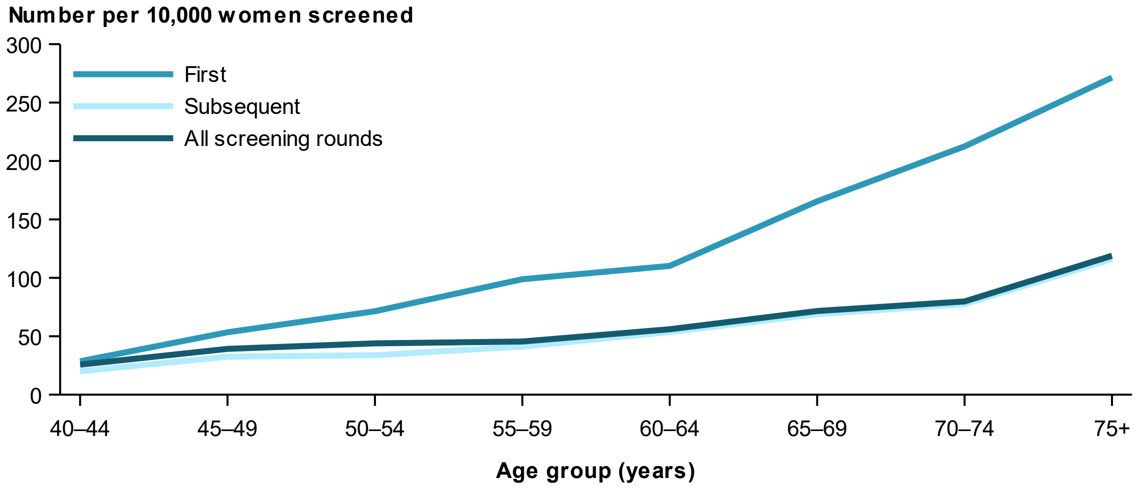


Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.24.

Age

Breast cancer detection rates increased with age in 2018, from 26 cases per 10,000 women screened for those aged 40–44, to 72 for those aged 65–69 (Figure 3.16). Breast cancer detection rates were highest for women aged 75 and over, with 119 women diagnosed with invasive breast cancer for every 10,000 women screened. This pattern—invasive breast cancer detection rates increasing with age—was true both for women attending their first screen and for women attending subsequent screens.

Figure 3.16: Invasive breast cancer detection by age group and screening rounds, 2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.23.

State and territory

In 2018, the breast cancer detection rate for women aged 50–74 varied between the states and territories for women attending both their first screening round and subsequent screening rounds (Table A3.25).

National Accreditation Standard (NAS) Measures related to invasive breast cancer detection

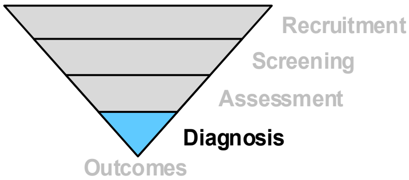
Table 3.4 shows the NAS Measures related to invasive breast cancer detection. While NAS Measures for women aged 50–74 do not yet have a target, BreastScreen Australia aims to maximise invasive breast cancer detection.

See Box 3.2 for information on the National Accreditation Standards.

Table 3.4: NAS Measures for invasive breast cancer detection calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2020*

NAS Measure		Value (crude rate)
NAS Measure 2.1.1(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their first screening episode who are diagnosed with invasive breast cancer.	90.7
NAS Measure 2.1.2(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their second or subsequent screening episode who are diagnosed with invasive breast cancer.	54.8
NAS Measure 2.1.3(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their first screening episode who are diagnosed with small (≤15mm) invasive breast cancer.	41.5
NAS Measure 2.1.3(b)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their second or subsequent screening episode who are diagnosed with small (≤15mm) invasive breast cancer.	33.3

Source: AIHW analysis of BreastScreen Australia data.



Performance indicator 5: Ductal carcinoma in situ (DCIS) detection

Summary

- 1,583 women were diagnosed with DCIS by BreastScreen Australia in 2018, of whom 1,384 (87.4%) were aged 50–74.
- In 2018, the age-standardised DCIS detection rate for women aged 50–74 was higher in the first screening round at 27.1 per 10,000 women than in subsequent screening rounds at 12.6.

Definition

The number of women aged 50–74 with DCIS detected through BreastScreen Australia per 10,000 women screened.

Rationale

Women with DCIS are at an increased risk of later developing invasive breast cancer (AIHW 2010; IARC 2002). As it is not currently possible to predict which DCIS cases might progress to invasive breast cancer, they are treated similarly to invasive breast cancer. Further, given the increased risk of invasive breast cancer after a diagnosis of DCIS—and that the detection and subsequent treatment of high-grade DCIS is likely to prevent deaths from invasive breast cancer (Eusebi et al. 1994)—BreastScreen Australia aims to maximise the detection of DCIS, just as it does for invasive breast cancer.

Guide to interpretation

DCIS is disaggregated into first and subsequent screening rounds because a woman is more likely to have DCIS diagnosed at her first screen than subsequent screens, since her first visit detects prevalent cases, not just incident cases.

To produce stable, comparable rates from the relatively small number of DCIS cases, detection of DCIS is reported by 10-year age groups and, when disaggregated by state and territory, is presented for all screening rounds combined.

As the BreastScreen Australia targeted age group was expanded from 50–69 to 50–74 from 1 July 2013, historical data are presented for women aged 50–69 to enable comparability over time.

The most recent DCIS data are for women screened in the index year 2018.

More information on DCIS

DCIS is a non-invasive tumour that arises from the lining of the ducts that carry milk from the milk-producing lobules to the nipple. The changes to the cells lining the milk ducts seen in DCIS are similar to those in invasive breast cancer, but unlike breast cancer, DCIS does not invade the surrounding breast tissue; instead, it is contained entirely within the milk duct.

Women with DCIS are at an increased risk of later developing invasive breast cancer (AIHW 2010; IARC 2002). BreastScreen Australia aims to maximise the detection of DCIS, just as it does for invasive breast cancer.

Results

In 2018, 1,583 women were diagnosed with DCIS by BreastScreen Australia, of whom 1,384 (87.4%) were aged 50–74 (Table A3.27).

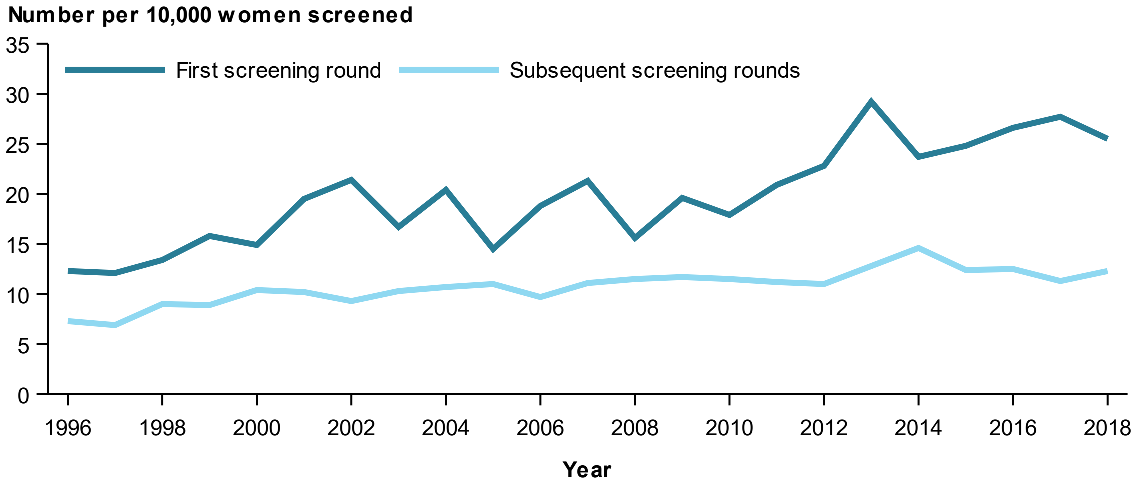
Of the 1,384 women aged 50–74, 202 were attending their first screen (equivalent to 27.1 women diagnosed per 10,000 women screened when age-standardised) and 1,182 were attending a subsequent screen (12.6 women diagnosed per 10,000 women when age-standardised).

Trends

Between 2008 and 2013, the age-standardised DCIS detection rate for women aged 50–69 for their first screening round increased from 15.6 cases to 29.2 cases per 10,000 women (Figure 3.17). Since 2013, the age-standardised DCIS rate for women aged 50–69 for their first screen has decreased, to 25.5 per 10,000 women in 2018.

Between 2008 and 2014, the age-standardised DCIS detection rate for women aged 50–69 for subsequent screening rounds increased from 11.5 to 14.6 cases per 10,000 women (Figure 3.17). This rate has decreased to 12.3 per 10,000 women in 2018.

Figure 3.17: DCIS detection, women aged 50–69, first and subsequent screening rounds, 1996 to 2018



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.26.

Age

Similar to detection of invasive breast cancer, DCIS detection rates increased with age.

In 2018, the DCIS detection rate for all screening rounds per 10,000 women screened was 11.1 cases for women aged 40–49, increasing to 17.5 for those aged 70–74, and 17.3 for ages 75 and over (Table A3.27).

State and territory

In 2018, the DCIS age-standardised detection rate for women aged 50–74 for all screening rounds varied between the states and territories, from 11.6 to 18.2 per 10,000 women screened (Table A3.28).

National Accreditation Standard (NAS) Measures related to DCIS detection

Table 3.5 shows the NAS Measures related to DCIS detection. While NAS Measures for women aged 50–74 do not yet have a target, BreastScreen Australia aims to maximise the DCIS detection.

See Box 3.2 for information on the National Accreditation Standards.

Table 3.5: NAS Measures for DCIS detection calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2020*

NAS Measure		Value (crude rate)
NAS Measure 2.2.1(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their first screening episode who are diagnosed with DCIS.	23.2
NAS Measure 2.2.2(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for their second or subsequent screening episode who are diagnosed with DCIS.	13.4

Source: AIHW analysis of BreastScreen Australia data.

Performance indicator 6a: Interval cancers

Summary

- For the index years 2013, 2014 and 2015, the interval cancer rate was higher in the second year (13–24 months) after a negative screening episode than in the first year (0–12 months).
- Over the same period, the interval cancer rates after a negative screening episode both for the first year (0–12 months) and the second year (13–24 months) were higher after subsequent screening rounds than after the first screening round.

Definition

The number of invasive breast cancers detected in women aged 50–69 screened through BreastScreen Australia that arise during an interval between 2 screening rounds, per 10,000 women.

Rationale

The ability of screening mammography to successfully detect invasive breast cancer in women in the target age group can be assessed by considering the relative number of:

- invasive breast cancers detected at a screening episode
- invasive breast cancers diagnosed 0–12 months after a screening episode detected no cancer
- invasive breast cancers diagnosed 13–24 months after a screening episode detected no cancer.

The goal of BreastScreen Australia is to have a high proportion of invasive breast cancers detected within screening episodes and a low proportion diagnosed after a screening episode detected no cancer (interval cancers).

Guide to interpretation

Interval cancer rates are disaggregated into time since screening (0–12 months, 13–24 months and 0–24 months) and screening round (first and subsequent).

To produce comparable rates from the relatively small number of cases, interval cancer rates are reported by 10-year age groups and aggregated over 3 years.

The most recent interval cancer data are for women aged 50–69 screened in the index years 2013, 2014 and 2015. This small lag in data availability is due to the fact that 2 years need to have passed since a woman’s last screen to know whether she was diagnosed with an interval cancer.

More information on interval cancers

Interval cancers are invasive breast cancers that are diagnosed after a screening episode that detected no cancer and before the next scheduled screening episode (Kavanagh at al. 1999). For most women, the next screening episode will occur around 24 months after her previous negative screening episode, as the recommended screening interval for most women in BreastScreen Australia is 24 months. The exception to this is women on annual screens, for whom the next screening episode will occur around 12 months after her previous negative screening episode.

An interval cancer may be:

- an aggressive breast cancer that emerges and grows very rapidly in the period between screening episodes
- a breast cancer that, due to the characteristics of the cancer or the breast tissue, is not visible on screening mammography and therefore not able to be detected
- a breast cancer that can be retrospectively detected on the previous screening mammogram.

The first two types of interval cancer described above are true interval cancers, and therefore do not represent any failure in detection; the third represents a failure of the screening process. Through the BreastScreen accreditation process, state and territory BreastScreen programs are required to audit interval cancers. All interval cancers in all state and territory BreastScreen Programs undergo clinical review. On investigation, more than 80% are found to be true interval cancers (AIHW 2019b).

Interval cancers may be detected outside BreastScreen Australia or through BreastScreen Australia, depending on the policies for screening symptomatic women in each state and territory that can affect interval cancer detection rates.

Box 3.3: Different policies across state and territory BreastScreen programs affects interval cancer detection rates

Differences in state and territory policies for managing women with symptoms may affect interval cancer rates. For example, in some jurisdictions, women with a negative screening mammogram but who have symptoms are referred for diagnostic follow-up outside BreastScreen Australia, rather than being recalled for assessment within BreastScreen Australia. Any cancers found in these women will be counted as ‘interval cancers’, leading to a higher apparent interval cancer rate. On the other hand, jurisdictions that do recall women to assessment if they have symptoms (even in the face of a negative screening mammogram) may have lower apparent interval cancer rates. These differing practices and policies affect the comparability of this indicator across jurisdictions.

Results

The latest data for interval cancers are for women screened in 2013, 2014 and 2015 (referred to as index years 2013–2015). These are the latest data available because at least 2 years need to have passed since a woman’s last routine screening mammogram in order to know whether she was diagnosed with an interval cancer in that time—often longer due to time required for cancer registries to be notified of the cancer, and for linkage between the BreastScreen registers and cancer registers to occur.

For women aged 50–69, the interval cancer rates for both first and subsequent screening rounds were higher in the 13–24 months after a negative screening episode than in the 0–12 months after a negative screening episode. Similarly, the interval cancer rates for both 0–12 months after a negative screening episode and 13–24 months after a negative screening episode were higher after subsequent screening rounds than after the first screening round (tables A3.29 and A3.30).

For the index years 2013–2015 combined, for women aged 50–69, in the 0–12 months after a woman's first negative screening episode, there were 5.7 interval cancers per 10,000 women. In the 0–12 months after a subsequent screening episode, there were 6.1 interval cancers per 10,000 women (Table A3.29).

For women aged 50–69, in the 13–24 months after a woman's first negative screening episode, there were 10.3 interval cancers per 10,000 women. In the 13–24 months after a subsequent screening episode, there were 12.0 interval cancers per 10,000 women (Table A3.30).

For the index years 2013–2015, there were no appreciable differences in the interval cancer rate between the first and subsequent screening rounds for either 0–12 months or 13–24 months after a negative screening episode (apparent differences are considered not statistically significant due to overlapping confidence intervals). This indicates that the possibility for women to be diagnosed with interval cancer is similar between the first and subsequent screening rounds for 0–12 months or 13–24 months after a negative screening episode (Table 3.6).

Table 3.6: Interval cancer rate, by time since screen, women aged 50–69 screened in 2013–2015

	Time since screen		
	0–12 months	**13–24 months**	**0–24 months**
First screening round			
Number	134	217	351
Crude rate	5.6	9.4	7.5
AS rate	5.7	10.3	7.9
95% CI	4.5–7.1	8.6–12.2	6.9–9.1
Subsequent screening rounds			
Number	1,248	2,243	3,491
Crude rate	6.2	12.1	9.0
AS rate	6.1	12.0	8.9
95% CI	5.8–6.5	11.5–12.5	8.6–9.2

Notes

1. 'Crude rate' is the number of interval cancers detected per 10,000 women-years; 'age-standardised (AS) rate' is the number of interval cancers detected per 10,000 women-years, age-standardised to the population of women attending a BreastScreen Australia service in 2008; 95% CI are 95% confidence intervals.
2. For confidence intervals, see Box A1.

Source: AIHW analysis of BreastScreen Australia data.

Age

For the index years 2013–2015, in the 0–12 months after a negative screening episode, the interval cancer rates for all screening rounds were lower for women aged 50–59 and 60–69, and higher for women outside these age groups (Table 3.7). In the 13–24 months after a negative screening round, the interval cancer rates were lower for women aged 40–49 and 50–59, and higher for women outside these age groups.

Table 3.7: Interval cancer rate, all screening rounds, by age group, women screened in 2013–2015

	Time since screen			
	0–12 months		13–24 months	
Age group (years)	**Number**	**Crude rate**	**Number**	**Crude rate**
40–49	300	7.9	418	12.0
50–59	716	6.0	1,196	11.0
60–69	666	6.2	1,264	12.6
70+	252	6.8	468	14.0

Note: 'Crude rate' is the number of interval cancers detected per 10,000 women-years.

Source: AIHW analysis of BreastScreen Australia data.

State and territory

For the index years 2013–2015, in the 0–24 months after a negative screening episode, the interval cancer rate for women aged 50–69 varied between the states and territories, from 6.3 to 10.6 per 10,000 women (for all screening rounds) (Table A3.32).

See Box 3.3 for information on how different policies across all states and territories BreastScreen programs affects interval cancer detection rates.

National Accreditation Standard (NAS) Measures related to interval cancers

Table 3.8 shows the NAS Measures related to interval cancers for women aged 50–69. BreastScreen Australia aims to minimise the number of cancers that are missed (false negatives).

See Box 3.2 for information on the National Accreditation Standards.

Table 3.8: NAS Measures for interval cancers calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2020*

NAS Measure		**Value (crude rate)**
NAS Measure 2.3.1(b)	<7.5 per 10,000 women aged 50–69 years who attend for screening are diagnosed with an interval invasive breast cancer in the first calendar year following a negative screening episode.	5.6 first screen 6.2 second screen
NAS Measure 2.3.2(b)	≤15 per 10,000 women aged 50–69 years who attend for screening are diagnosed with an interval invasive breast cancer in the second calendar year following a negative screening episode.	9.4 first screen 12.1 second screen

Source: AIHW analysis of BreastScreen Australia data.

Performance indicator 6b: Program sensitivity

Summary

- For the index years 2013, 2014 and 2015, program sensitivity results differ by screening round, being higher after a woman’s first visit than after subsequent visits.
- Program sensitivity rates over the same period for both 0–12 months and 0–24 months (for all screening rounds) were lowest for women aged 40–49.

Definition

Program sensitivity is directly related to interval cancers. It is the proportion of invasive breast cancers detected by BreastScreen Australia (screen-detected cancers) out of all invasive breast cancers (interval cancers plus screen-detected cancers) diagnosed in program-screened women aged 50–69 in the screening interval (2 years).

Rationale

High program sensitivity indicates that few cancers in screened women are missed by BreastScreen Australia—that is, most breast cancers are detected by BreastScreen Australia and reported in Performance Indicator 4 (*Invasive breast cancer detection*) rather than in Performance Indicator 6a (*Interval cancers*). High sensitivity is desirable.

Guide to interpretation

Program sensitivity is disaggregated into time since screening (0–12 months and 0–24 months) and screening round (first and subsequent).

To produce comparable rates from the relatively small number of cases, program sensitivity rates are reported by 10-year age groups and aggregated over 3 years.

The latest program sensitivity data are for women screened in 2013, 2014 and 2015 (referred to as index years 2013–2015). These are the latest data available because at least 2 years need to have passed since a woman’s last routine screening mammogram in order to know whether she was diagnosed with an interval cancer in that time—often longer due to time required for cancer registries to be notified of the cancer and for linkage between the BreastScreen registers and cancer registers to occur.

Specificity

Sensitivity is the ability of a screening test to accurately identify the disease in people who have that disease. Specificity, on the other hand, is the ability of a screening test to accurately identify people who do not have the disease—referred to as a ‘true negative’ screening result. The vast majority of women who are given a negative screening result after their screening mammography through BreastScreen Australia do not have breast cancer, and thus receive a true negative screening result.

Women who are not given a negative screening result are recalled to assessment for further investigation. A 'true positive' screening result is when they are found to have breast cancer at assessment; a 'false positive' screening result is when women are recalled to assessment for further investigation when they do not have breast cancer. Most women who are recalled to assessment through BreastScreen Australia do not have breast cancer.

Results

For women aged 50–69 in the index years 2013–2015, program sensitivity in the first year (0–12 months) was 94.2% after their first screening round and 88.4% after subsequent screening rounds (Table 3.9).

Program sensitivity in the 2 years (0–24 months) was 85.9% for the first screening round and 73.5% for subsequent screening rounds (Table 3.9).

Unlike the interval cancer data, program sensitivity differs by screening round, being higher after a woman's first visit compared with her subsequent visits. This may be because women at their first screening visit are more likely to be recalled to assessment for further investigation, and thus more likely to have a breast cancer detected.

Table 3.9: Program sensitivity, by time since screen, women aged 50–69 screened in 2013–2015

	Time since screen	
	0–12 months	**0–24 months**
First screening round		
Crude rate	93.7	85.0
AS rate	94.2	85.9
Subsequent screening rounds		
Crude rate	89.2	74.8
AS rate	88.4	73.5

Note: 'Crude rate' is the number of screen detected cancers as a percentage of all cancers (screen-detected and interval cancers); 'Age-standardised (AS) rate' is the number of screen-detected cancers as a percentage of all cancers (screen-detected and interval cancers), age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Age

For the index years 2013–2015, program sensitivity (for both 0–12 months and 0–24 months) was lowest for women aged 40–49, increasing with each 10-year age group to be highest for women aged 70 and over (Table 3.10).

These results point to lower sensitivity of screening mammography for women aged 40–49, meaning that BreastScreen Australia is less able to detect invasive breast cancers in women aged 40–49 who attend for screening. This is likely to be due to features of young breasts, such as high density, which can make breast cancers difficult to visualise with screening mammography (Irwig et al. 1997).

Table 3.10: Program sensitivity, all screening rounds, by age group, women screened in 2013–2015

	Time since screen	
	0–12 months	0–24 months
Age group (years)	Crude rate	Crude rate
40–49	81.1	64.3
50–59	88.1	73.4
60–69	91.4	78.5
70+	93.6	83.6

Note: 'Crude rate' is the number of screen detected cancers as a percentage of all cancers (screen detected and interval cancers).

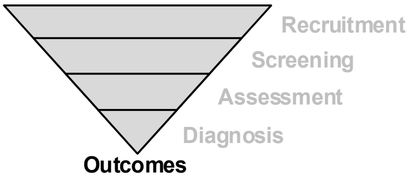
Source: AIHW analysis of BreastScreen Australia data.

State and territory

In 2013–2015, for women aged 50–69, program sensitivity rates varied between the states and territories, ranging from 72.1% to 84.8% (all screening rounds) (Table A3.36).

As noted for the interval cancers indicator, both interval cancers and sensitivity rates in each state and territory are affected by the varying jurisdictional policies for managing symptomatic women. This affects the comparability of this indicator across jurisdictions.

See Box 3.3 for information on how different policies across state and territory BreastScreen programs affect interval cancer detection rates.



3.7 Outcomes

Performance indicator 7a: Invasive breast cancer incidence

Summary

- In 2016, 17,354 new cases of breast cancer were diagnosed in women in Australia. Of these, 10,756 (62.0%) occurred in women aged 50–74.
- Breast cancer incidence for women aged 50–74 decreased with increasing remoteness.
- Breast cancer incidence in women aged 50–74 decreased with increasing socioeconomic disadvantage.
- Indigenous women aged 50–74 had a lower breast cancer incidence rate than non-Indigenous women.

Definition

The number of new cases of invasive breast cancer in women aged 50–74 per 100,000 resident female population in a calendar year.

Rationale

Incidence data provide information about the number of new cases of invasive breast cancer in the population, which is an indicator of the program’s performance against its aim to detect unsuspected breast cancer in women through organised screening.

Guide to interpretation

Incidence data include both screen-detected breast cancers (detected through BreastScreen Australia) and breast cancers detected outside BreastScreen Australia.

Incidence of invasive breast cancer by state and territory, remoteness area, socioeconomic status and Indigenous status is reported over a 5-year (instead of a 12-month) period.

Lower breast cancer incidence is better.

The Australian Cancer Database (ACD) currently contains data on all cases of cancer diagnosed from 1982 to 2015 for all states and territories; for 2016, it contains data for all jurisdictions except the Northern Territory.

The most recent invasive breast cancer incidence data are for new cases diagnosed in 2016 and estimates to 2020.

Results

In 2016, the latest year of national data available in the Australian Cancer Database, there were 17,354 new cases of breast cancer diagnosed in women in Australia, equivalent to 125.8 new cases per 100,000 women when age-standardised (Table A3.37).

Of these 17,354 new cases, 62.0% (10,756) occurred in women aged 50–74. This is equivalent to 324.5 new cases per 100,000 women aged 50–74 (age-standardised).

Box 3.4: Estimated incidence to 2020

Incidence data are estimated to the current year of reporting, based on 2007–2016 incidence data (note that actual incidence data for 2017–2020 may differ from estimated data for these years due to current and ongoing program or practice changes).

In 2020, it is estimated that there will be 19,807 new cases of breast cancer in Australian women, equivalent to 132.5 new cases per 100,000 women when age-standardised.

Of these 19,807 new cases, it is estimated that 12,165 will occur in women aged 50–74, equivalent to 337.2 new cases per 100,000 women when age-standardised (Table A3.37).

Box 3.5: Invasive breast cancer detected through BreastScreen Australia

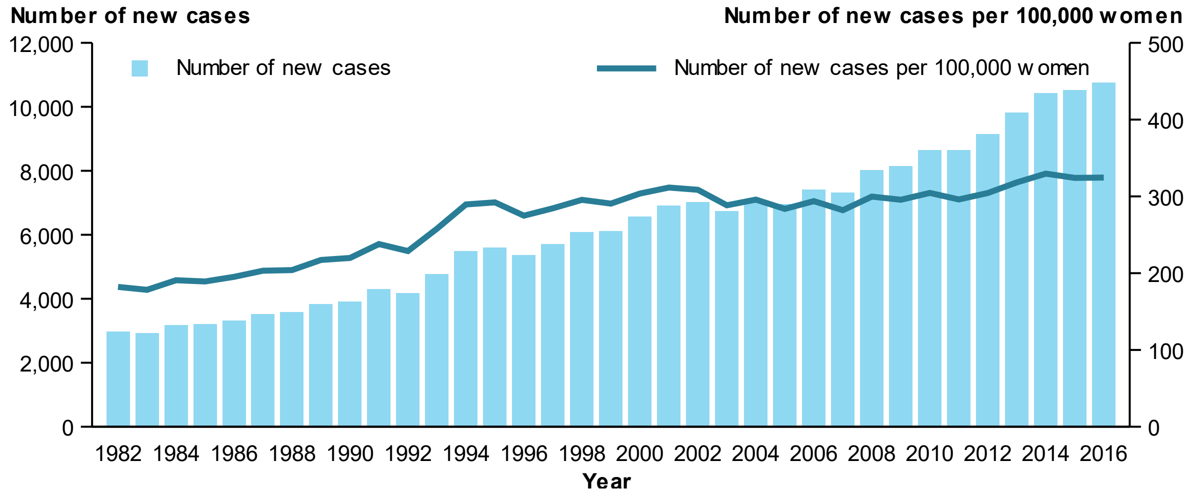
About half (50.8%) of all invasive breast cancer cases diagnosed in 2016 in women aged 50–74 were detected through BreastScreen Australia (38.1% for women aged 40 and over).

Trends

Prior the introduction of BreastScreen Australia in 1991, the age-standardised incidence rate of breast cancer for women aged 50–74 had increased per 100,000 women from 182 new cases in 1982 to 220 in 1990.

Following the introduction of BreastScreen Australia, the age-standardised incidence rate for women aged 50–74 increased per 100,000 women from 238 new cases in 1991 to 311 in 2001. From 2001 to 2012, the rate per 100,000 remained relatively steady at around 300, before increasing to 330 in 2014, and dropping back to 320 in 2016 (Figure A3.18).

Figure 3.18: Incidence of breast cancer in women aged 50–74, 1982 to 2016



Notes

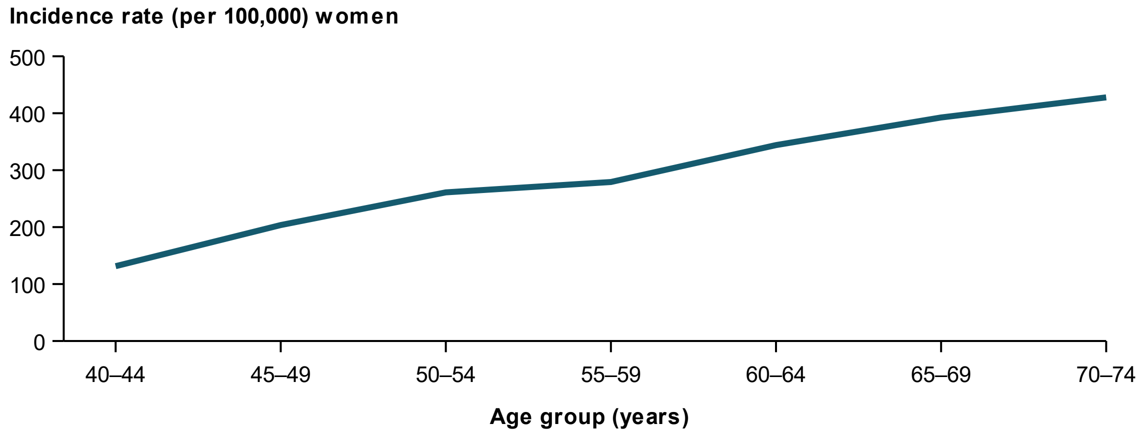
1. Rates are age-standardised to the Australian population as at 30 June 2001 and expressed per 100,000 women.
2. 2016 data contain data for all jurisdictions except the Northern Territory for which incidence data have been estimated.

Source: AIHW Australian Cancer Database 2016. Data for this figure are available in Table A3.37.

Age

In 2016, breast cancer incidence increased with age, from 131.4 new cases per 100,000 women aged 40–44 to 427.8 per 100,000 women aged 70–74 (Figure 3.19).

Figure 3.19: Incidence of breast cancer, by age group, 2016



Notes

1. 'Crude rates' is the number of new cases of breast cancer expressed per 100,000 women.
2. 2016 data contains data for all jurisdiction except the Northern Territory for which incidence data have been estimated.

Source: AIHW Australian Cancer Database 2016. Data for this figure are available in Table A3.38.

Type

Invasive breast cancers by type are shown in Table 3.11 (with 2016 incidence data estimated for the Northern Territory).

In 2016, the most common breast cancer type for women aged 50–74 was invasive ductal carcinoma, at 78.0% of all breast cancers; invasive lobular cancer was the second most common, at 13.3%. Other breast cancer types were rarer, ranging from between fewer than 1 and 7 new cases per 100,000 women aged 50–74. These rarer cancer types accounted for between less than 0.1% and 2.1% of all invasive breast cancers; 'unspecified' breast cancers accounted for 1.1% of cases (Table 3.11).

Table 3.11: Incidence of breast cancer in women aged 50–74, by type, 2016

Type of breast cancer	New cases	Crude rate	Percentage of breast cancers
Invasive ductal carcinoma	8,394	257.3	78.0
Invasive lobular carcinoma	1,433	43.9	13.3
Medullar carcinoma and atypical medullary carcinoma	19	0.6	0.2
Tubular carcinoma and invasive cribriform carcinoma	189	5.8	1.8
Mucinous carcinoma	199	6.1	1.9
Invasive papillary carcinoma	230	7.1	2.1
Inflammatory carcinoma	13	0.4	0.1
Mesenchymal	6	0.2	0.1
Other—specified	153	4.7	1.4
Unspecified	118	3.6	1.1
Total	10,756	329.7	100.0

Notes

1. 'Crude rate' is the number of new cases per 100,000 women.
2. Histology codes that comprise each breast cancer group appear in Table D1.
3. 2016 data for the Northern Territory were estimated, as the actual data were not available.

Source: AIHW Australian Cancer Database 2016.

State and territory

In 2011–2015, the incidence of breast cancer for women aged 50–74 was relatively stable across all states and territories, with most rates around the national age-standardised rate of 315.1 new cases per 100,000 women (Table A3.40).

The exceptions were the least populated jurisdictions—the Australian Capital Territory, with a higher incidence of 332.0 new cases per 100,000 women, and the Northern Territory with lower incidence of 266.4 (Table A3.40). Of note, the data for the 2 least-populated jurisdictions are subject to variation due to smaller numbers, even with 5 years of combined data.

Remoteness area

In 2011–2015, breast cancer incidence for women aged 50–74 fell with increasing remoteness.

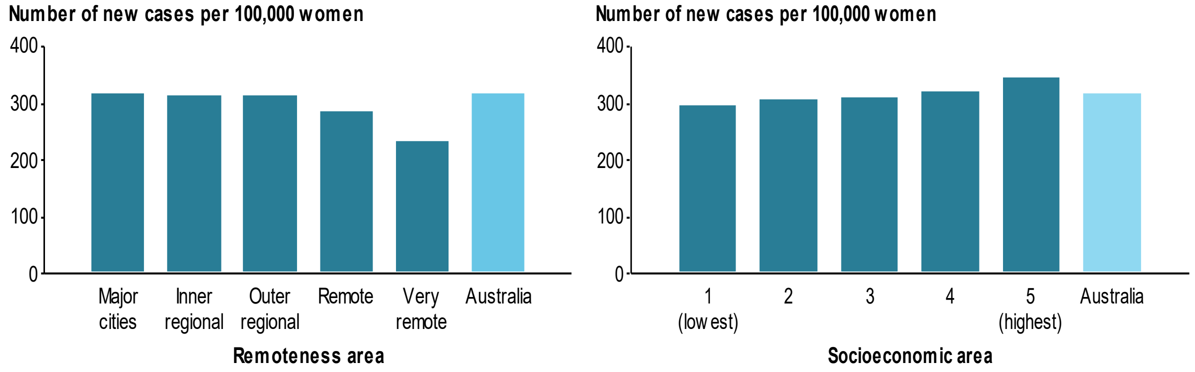
The age-standardised incidence rate for women aged 50–74 per 100,000 women was highest for those living in *Major cities* at 316.9 new cases and lower for those living in *Inner regional* areas and *Outer regional* areas at 313.3 and 311.0 new cases, respectively. The lowest incidence rates were for women living in *Remote* and *Very remote* areas at 284.1 and 230.4 new cases per 100,000 women, respectively (Figure 3.20).

Socioeconomic area

In 2011–2015, breast cancer incidence for women aged 50–74 fell with increasing socioeconomic disadvantage.

The age-standardised incidence rate for women aged 50–74 per 100,000 women was highest for those living in the highest socioeconomic areas at 343.5 new cases, and lowest for those living in the lowest socioeconomic areas at 296.3 new cases (Figure 3.20).

Figure 3.20: Incidence of breast cancer in women aged 50–74, by remoteness area and by socioeconomic area, 2011–2015



Note: Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW Australian Cancer Database 2016. Data for this figure are available in tables A3.41 and A3.42.

Indigenous status

Reliable national data on the diagnosis of breast cancer for Indigenous Australians are not available. All state and territory cancer registries collect information on Indigenous status; however, in some jurisdictions, the quality of the data is insufficient for analysis. Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

The incidence counts and rates for Indigenous and non-Indigenous Australians presented are underestimates due to the relatively large proportion of people whose Indigenous status is not stated, or not available. Also, it is likely that some Indigenous Australians are misclassified as non-Indigenous. Therefore, the estimates presented should be interpreted with caution.

Box 3.6: Indigenous Australians—incidence and mortality: populations and rates

To derive breast cancer incidence and mortality rates for Indigenous Australians, this report used Indigenous population estimates and projections based on the 2016 Census, which were the most recent estimates available when this report was prepared.

The final estimated resident Aboriginal and Torres Strait Islander population as at 30 June 2016 was 19% larger than the estimated population as at 30 June 2011 (ABS 2018). The Australian Bureau of Statistics (ABS) notes that the population increase is greater than demographic factors alone can explain. As well, the 2016 estimated population was 7% larger than the 2016 projected population based on the 2011 Census.

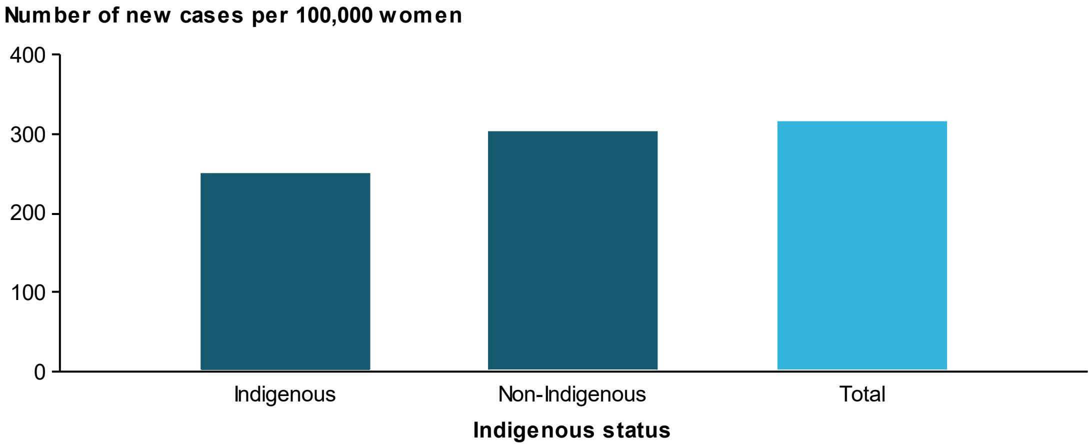
The extent of the increase in the Indigenous population estimates between 2011 and 2016 means that any rates calculated with Indigenous population estimates based on the 2016 Census will be lower than those based on the 2011 Census and should not be compared with rates calculated using populations based on previous Censuses.

Analysis of data from these jurisdictions showed that, in 2011–2015, there were 810 Indigenous women diagnosed with breast cancer, of whom 501 (61.9%) were aged 50–74 (Table A3.44). This was a crude incidence rate of 233.1 new cases per 100,000 women aged 50–74 (Table A3.45).

In 2011–2015, Indigenous women aged 50–74 had a lower age-standardised incidence rate of breast cancer than non-Indigenous women—250.5 new cases per 100,000 Indigenous women compared with 302.6 new cases per 100,000 non-Indigenous women (Figure 3.21).

In 2001–2005, the crude incidence rate of breast cancer in Indigenous women aged 50–74 was 216.8, increasing to 233.1 new cases per 100,000 women in 2011–2015 (Table A3.50).

Figure 3.21: Incidence of breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status, 2011–2015



Notes

1. ‘Total’ includes women with a ‘not stated’ Indigenous status.
2. See Box 3.6 for more information on rates calculated using the 2016 Census.
3. Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Source: AIHW Australian Cancer Database 2016. Data for this figure are available in Table A3.43.

In 2011–2015, the crude incidence rate of breast cancer for Indigenous women aged 50–74 was highest for women living in New South Wales at 242.9 new cases per 100,000 women (Table A3.47).

In 2011–2015, the crude incidence rate of breast cancer for Indigenous women aged 50–74 was highest in for women living in *Major Cities* at 255.6 new cases per 100,000 women (Table A3.49).

Performance indicator 7b: Ductal carcinoma in situ (DCIS) incidence

Summary

In 2016, 2,261 new cases of DCIS were diagnosed in women in Australia. Of these, 1,673 (74.0%) occurred in women aged 50–74.

Definition

The number of new cases of DCIS in women aged 50–74 per 100,000 estimated resident female population in a 12-month period.

Rationale

DCIS incidence data provide information about the underlying level of DCIS in Australia. DCIS is known as a ‘disease of screening’ and was rarely detected before breast screening was introduced. Since the introduction of screening mammography, detection of DCIS has increased. Annual monitoring of these data by various groupings (such as age or location) may reveal findings of concern or positive trends that can be used to inform BreastScreen Australia as well as broader policies for DCIS in Australian women.

Guide to interpretation

These data include both screen-detected DCIS cases (through BreastScreen Australia) and DCIS cases detected outside the screening program.

DCIS incidence data are reported per 100,000 women in the population.

To produce reliable rates from the relatively small number of DCIS cases, incidence of DCIS is reported by 10-year age groups.

The Australian Cancer Database (ACD) is the source of DCIS incidence data.

The counting rules for DCIS incidence were revised for the 2016 ACD. For this reason, comparisons should not be made with DCIS data from previous versions of the ACD. See Box 3.7 for more details.

The most recent incidence of DCIS data are for new cases diagnosed in 2016. Note that 2016 incidence data include estimates for the Northern Territory.

Results

In 2016, there were 2,261 new cases of DCIS diagnosed in Australian women, equivalent to an age-standardised rate of 16.5 new cases for every 100,000 women in the population (Table A3.51).

Of these 2,261 new cases, 74.0% (1,673) were in women aged 50–74, the target population of BreastScreen Australia. These 1,673 new cases equated to an age-standardised rate of 50.6 new cases of DCIS for every 100,000 women aged 50–74 in the population.

Box 3.7: Changes in counting rules for DCIS incidence in the 2016 ACD

The counting rules for DCIS incidence were revised for the 2016 ACD. This affects the counts for women who have been diagnosed with both an invasive and an in situ ductal carcinoma. In previous versions of the ACD, a woman's first DCIS was always counted. Starting with the 2016 ACD, a woman's first DCIS is counted if it is diagnosed before her first invasive ductal carcinoma but not counted if it is diagnosed at the same time or afterwards. This change brings the counting rules for DCIS into line with the rules for counting multiple invasive ductal carcinomas. The new rules lead to lower counts and rates of DCIS incidence than the old rules. For this reason, comparisons should not be made with DCIS data from previous versions of the ACD.

Box 3.8: DCIS cases detected through BreastScreen Australia

About 4 in 5 (80.1%) DCIS cases diagnosed in 2016 in women aged 50–74 were detected through BreastScreen Australia (70.4% for women aged 40 and over). See Box 3.7 for more information on DCIS incidence.

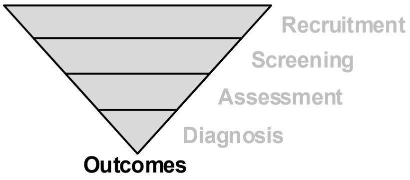
Trends

DCIS incidence has increased over time. For women aged 50–74, the age-standardised DCIS rate per 100,000 women rose from 30.3 new cases in 1996 to a peak of 55.3 in 2014, before falling to 50.6 new cases in 2016 (Table A3.51).

Age

Similarly to invasive breast cancer, the incidence of DCIS increases with age. In 2016, the age-specific incidence rate of DCIS per 100,000 women rose from 20.9 new cases for women aged 40–49 to 58.0 for those aged 60–69 before falling to 32.7 for those aged 70 and over (Table A3.52).

In 2016, DCIS in women aged 50–74 represented 74.0% of all DCIS cases diagnosed in that year (Table A3.51).



Performance indicator 8: Mortality from breast cancer

Summary

- In 2018, there were 2,999 deaths from breast cancer in women in Australia. Of these, 1,423 (47.4%) occurred in women aged 50–74.
- Breast cancer mortality in women aged 50–74 was highest for those living in *Inner regional* areas and lowest for those in *Very Remote* areas.
- Breast cancer mortality in women aged 50–74 increased with increasing socioeconomic disadvantage.
- Indigenous women aged 50–74 had a higher breast cancer mortality rate than non-Indigenous women.

Definition

The number of deaths from breast cancer in women aged 50–74 per 100,000 estimated resident female population in a calendar year.

Rationale

Mortality data provide contextual information on the number of deaths from breast cancer in the population. This is an indicator of BreastScreen Australia's performance against its aim to reduce mortality from breast cancer through organised screening.

Guide to interpretation

Mortality data include both mortality from screen-detected breast cancers (detected through BreastScreen Australia) and mortality from breast cancers detected outside BreastScreen Australia.

Mortality from breast cancer by state and territory, remoteness area, socioeconomic status and Indigenous status is reported over a 5-year (instead of a 12-month) period.

The National Mortality Database (NMD) is the source of breast cancer mortality data.

The most recent data for mortality from breast cancer are deaths in 2018.

Results

In 2018, the latest year of national data available in the AIHW National Mortality Database, there were 2,999 deaths from breast cancer in Australia. This is equivalent to a mortality rate of 19.1 deaths per 100,000 women when age-standardised (Table A3.53).

Of these 2,999 deaths, 47.4% (1,423) occurred in women aged 50–74, equivalent to 40.4 deaths per 100,000 women aged 50–74 when age-standardised.

Box 3.9: Estimated mortality to 2020

Mortality data are estimated to the current year. These estimates are based on analysis of 2009–2018 mortality data. (Note that actual mortality data for 2020 may differ from estimated data for these years, due to current and ongoing program or practice changes).

In 2020, it is estimated that there will be 2,997 deaths from breast cancer in women, equivalent to 18.2 deaths per 100,000 women when age-standardised.

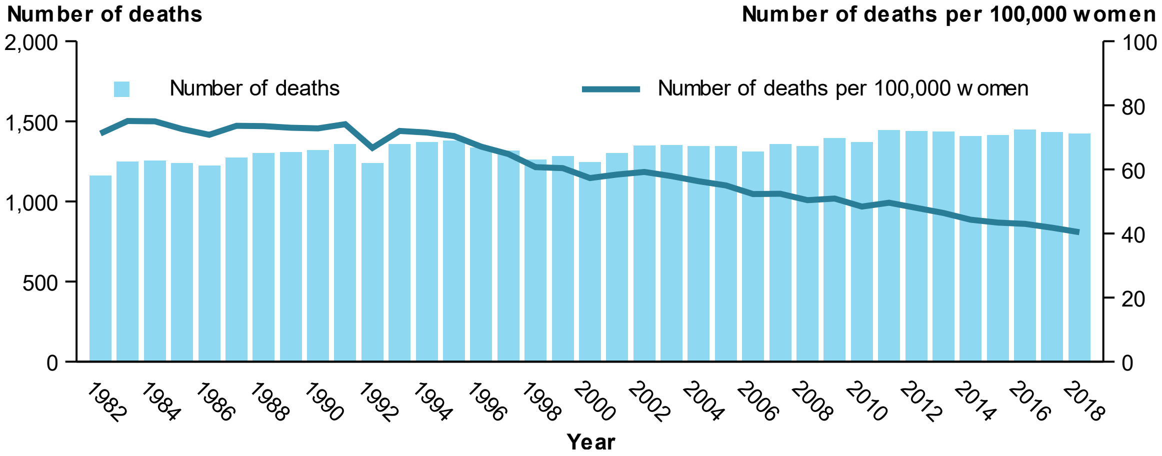
Of these 2,997 deaths, it is estimated that 1,403 will occur in women aged 50–74, equivalent to 38.2 deaths per 100,000 when age-standardised.

Trends

Breast cancer mortality rates have fallen over time, with this decrease evident after the introduction of BreastScreen Australia in 1991. The age-standardised mortality rate from breast cancer in women aged 50–74 fell from 74 deaths per 100,000 in 1991 to 40 deaths per 100,000 in 2018 (Figure 3.22).

The fall in breast cancer mortality in women aged 50–74 has been attributed in part to the early detection of breast cancer through BreastScreen Australia, along with advances in the management and treatment of breast cancer (BreastScreen Australia EAC 2009).

Figure 3.22: Mortality from breast cancer in women aged 50–74, 1982–2018



Notes

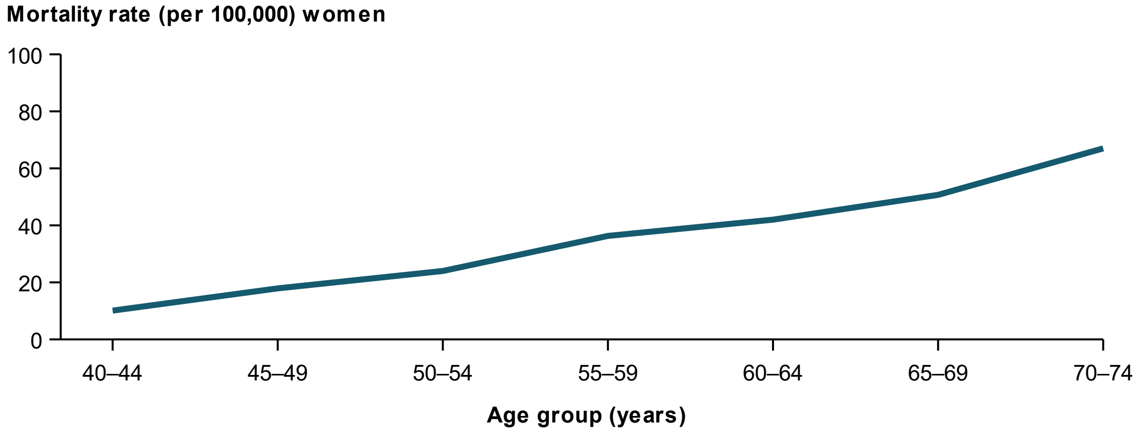
1. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database. Data for this figure are available in Table A3.53.

Age

In 2018, breast cancer mortality increased with age, from 10.1 deaths per 100,000 women aged 40–44 to 67.0 per 100,000 women aged 70–74 (Figure 3.23).

Figure 3.23: Mortality from breast cancer, by age group, 2018



Note: 'Crude rate' is the number of deaths of breast cancer expressed per 100,000 women.

Source: AIHW National Mortality Database. Data for this figure are available in Table A3.54.

State and territory

In 2014–2018, the age-standardised mortality rate from breast cancer for women aged 50–74 varied between the states and territories, from 35.1 deaths per 100,000 women in the Australian Capital Territory to 46.8 deaths per 100,000 in the Northern Territory (Table A3.55).

Remoteness area

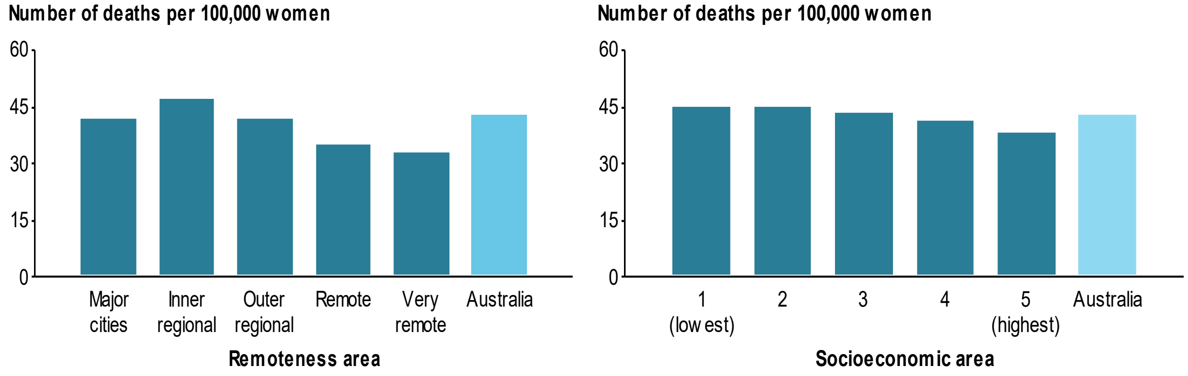
In 2014–2018, the age-standardised mortality rate from breast cancer for women aged 50–74 was highest per 100,000 women for those living in *Inner regional* areas, at 46.6 deaths, and lowest for those living in *Very remote* areas, at 32.5 deaths (Figure 3.24).

Socioeconomic area

In 2014–2018, the breast cancer mortality rate for women aged 50–74 increased with increasing socioeconomic disadvantage.

The age-standardised incidence rate for women aged 50–74 was highest per 100,000 women for those living in the lowest socioeconomic areas, at 45.0 deaths, and lowest for those living in the highest socioeconomic areas, at 38.1 deaths (Figure 3.24).

Figure 3.24: Mortality from breast cancer in women aged 50–74, by remoteness area and by socioeconomic area, 2014–2018



Notes

1. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary versions. Revised and preliminary versions are subject to further revision by the ABS.
2. Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database. Data for this figure are available in tables A3.56 and A3.57.

Indigenous status

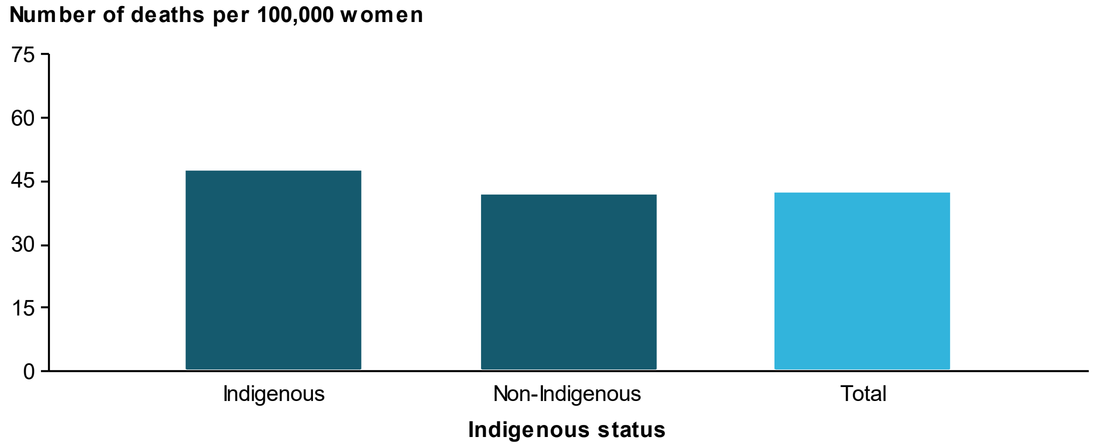
Only mortality data from New South Wales, Queensland, Western Australia, South Australia and the Northern Territory are considered adequate for reporting by Indigenous status. Other jurisdictions have a small number of Indigenous deaths, and the identification of these in their death registration systems is relatively poor, making the data less reliable. Note that these jurisdictions differ from those used to calculate incidence for Indigenous and non-Indigenous Australians. See Box 3.6 for information on Indigenous rates calculated using Indigenous population estimates from the 2016 Census.

In these jurisdictions, for the period 2014–2018, there were 189 deaths from breast cancer among Indigenous women, of whom 116 (61.4%) were aged 50–74 (Table A3.59). This was a crude rate of 43.8 deaths from breast cancer per 100,000 women aged 50–74 (Table A3.60).

In 2014–2018, Indigenous women aged 50–74 had a higher age-standardised mortality rate from breast cancer than non-Indigenous women (47.4 compared with 41.8 deaths per 100,000 women) (Figure 3.25).

The crude mortality rate from breast cancer in Indigenous women aged 50–74 has decreased, from 49.2 per 100,000 in 2004–2008, to 42.0 per 100,000 in 2009–2013 and 43.8 per 100,000 in 2014–2018 (Table A3.66).

Figure 3.25: Mortality from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2014–2018



Source: AIHW National Mortality Database. Data for this figure are available in Table A3.58.

In 2014–2018, the crude mortality rate from breast cancer for Indigenous women aged 50–74 was highest in the Northern Territory at 46.1 deaths per 100,000 women (Table A3.62).

In 2014–2018, the crude mortality rate from breast cancer for Indigenous women aged 50–74 was highest in *Inner Regional* and *Outer Regional* areas at 44.7 per 100,000 women (Table A3.64).

4 Picture of women aged 50–74 attending BreastScreen Australia in 2018

The majority of women who participate in BreastScreen Australia experience only the screening test. In 2018, of the 86,965 women aged 50–74 who screened for the first time, 9,794 (11.3%) were recalled for further assessment. Of the 884,552 women attending subsequent screens, 31,231 (3.5%) were recalled.

Most of the women recalled to assessment did not have an invasive breast cancer or DCIS detected (see Section 3.6, ‘Performance indicator 5: Ductal carcinoma in situ detection (DCIS)’ for more information on DCIS and how it differs from invasive breast cancer). Of the 9,794 women recalled to assessment after a first screen, 991 (10.1%) had an invasive breast cancer or DCIS detected; of the 31,231 women recalled to assessment after a subsequent screen, 6,033 (19.3%) had an invasive breast cancer or DCIS detected (Table 4.1).

This means that in 2018, of the 86,965 women aged 50–74 screened for the first time, 1.1% had an invasive breast cancer or DCIS detected, and of the 884,552 women attending subsequent screens, 0.7% had an invasive breast cancer or DCIS detected through BreastScreen Australia (Table 4.1).

Table 4.1: Number of women aged 50–74 who had an invasive breast cancer or DCIS detected, first and subsequent screening rounds, 2018

	Number	% of women screened	% of women recalled to assessment
Screened			
First screening round	86,965	. .	. .
Subsequent screening rounds	884,552	. .	. .
Recalled to assessment			
First screening round	9,794	11.3	. .
Subsequent screening rounds	31,231	3.5	. .
Invasive breast cancer or DCIS detected			
First screening round	991	1.1	10.1
Subsequent screening rounds	6,033	0.7	19.3

Source: AIHW analysis of BreastScreen Australia data.

5 Spotlight on population groups

BreastScreen Australia is monitored in relation to equity of access for different population groups. Access to services is a national policy feature of BreastScreen Australia, especially for Aboriginal and Torres Strait Islander women (hereafter respectfully referred to as Indigenous women) and those from culturally and linguistically diverse backgrounds, and rural/remote, or lower socioeconomic areas. Routine monitoring may reveal emerging trends for further investigation.

This chapter provides a summary of the performance indicators for 4 population subgroups. It should be noted that there is significant overlap of the Indigenous population with 2 of the other population subgroups presented here, due to higher proportions of Indigenous Australian participants living in the lowest socioeconomic areas and in *Very remote* areas.

5.1 Low socioeconomic areas

This section compares performance indicator results between the highest and lowest socioeconomic areas only.

Women aged 50–74 living in the lowest socioeconomic areas had a lower age-standardised participation rate (52.1%) than women living in the highest socioeconomic areas (54.6%) (Table 5.1).

Women aged 50–74 living in the lowest socioeconomic areas also had a lower breast cancer incidence rate than those living in the highest socioeconomic areas (296.3 compared with 343.5 per 100,000). However, women in the lowest socioeconomic areas had a higher mortality rate from breast cancer than those in the highest socioeconomic areas (45.0 compared with 38.1 per 100,000).

Table 5.1: Summary of performance indicators for lowest and highest socioeconomic areas for women aged 50–74

Indicator		Lowest socioeconomic areas	Highest socioeconomic areas	Lowest compared to highest
PI1	Participation	52.1%	54.6%	Lower
PI7a	Breast cancer incidence	296.3 per 100,000	343.5 per 100,000	Lower
PI8	Breast cancer mortality	45.0 per 100,000	38.1 per 100,000	Higher

Notes

1. The participation indicator PI1 is reported for the period 2017–2018. The incidence indicator PI7 is reported for the period 2011–2015. The mortality indicator PI8 is reported for 2014–2018. Rates are age-standardised to assist in comparisons across population groups.
2. Indicators PI2 (rescreening), PI3 (recall to assessment), PI4 (invasive breast cancer detection), PI5 (DCIS detection), PI6a (interval cancers), PI6b (program sensitivity) and PI7b (DCIS incidence) are not reported due to data incompleteness or unavailability.

Sources: AIHW analysis of BreastScreen Australia data; AIHW Australian Cancer Database 2016; AIHW National Mortality Database.

5.2 Very remote areas

This section compares performance indicator results between *Major cities* and *Very remote* areas only.

Women aged 50–74 living in *Very remote* areas had a lower participation rate than women living in *Major cities* (43.3% compared with 53.2%) (Table 5.2).

Women aged 50–74 living in *Very remote* areas had a lower breast cancer incidence rate than those living in *Major cities* (230.4 compared with 316.9 per 100,000). They also had a lower mortality rate from breast cancer (32.5 compared with 41.4 per 100,000) (Table 5.2).

Table 5.2: Summary of performance indicators for *Very remote* and *Major cities* areas for women aged 50–74

Indicator		Very remote	Major cities	Very remote compared to Major cities
PI1	Participation	43.3%	53.2%	Lower
PI7a	Breast cancer incidence	230.4 per 100,000	316.9 per 100,000	Lower
PI8	Breast cancer mortality	32.5 per 100,000	41.4 per 100,000	Lower

Notes

1. The participation indicator PI1 is reported for the period 2017–2018. The incidence indicator PI7 is reported for the period 2011–2015. The mortality indicator PI8 is reported for 2014–2018. Rates are age-standardised to assist in comparisons across population groups.
2. Indicators PI2 (rescreening), PI3 (recall to assessment), PI4 (invasive breast cancer detection), PI5 (DCIS detection), PI6a (interval cancers), PI6b (program sensitivity) and PI7b (DCIS incidence) are not reported due to data incompleteness or unavailability.

Sources: AIHW analysis of BreastScreen Australia data; AIHW Australian Cancer Database 2016; AIHW National Mortality Database.

5.3 Indigenous Australians

Participation in BreastScreen Australia

In 2017–2018, a total of 30,430 Indigenous women aged 40 and over participated in BreastScreen Australia (Table A3.9). Of these, 24,001 were aged 50–74, equating to a crude participation rate of 37.3% (Table A3.8).

The rates of participation in BreastScreen Australia were highest among Indigenous women aged 65–69 (43.5%) and 60–64 (41.3%) (Table A3.9). Nationally, the crude participation rate for women aged 50–74 was highest for Indigenous women living in *Inner regional* areas (41.4%) (Table A3.13).

Since 1996–1997, the crude rate of Indigenous women aged 50–69 participating in BreastScreen Australia increased from 25.0% to 37.1% in 2017–2018 (Table 3.14).

For more information about participation in BreastScreen Australia among Indigenous women, see Section 3.3, ‘Performance indicator 1: Participation’.

Breast cancer incidence

Data on breast cancer incidence and survival by Indigenous status are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital

Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

In these jurisdictions, in 2011–2015, 810 Indigenous women were diagnosed with breast cancer, 501 (61.9%) of whom were aged 50–74 (Table A3.44). This was a crude rate of 233.1 new cases per 100,000 women aged 50–74 (Table A3.45). The incidence of breast cancer was highest among Indigenous women aged 65–69 and 75 and older (403.6 and 370.3 per 100,000, respectively).

Among the jurisdictions for which data are available, the incidence of breast cancer was highest among Indigenous women aged 50–74 living in *Major cities* (255.6 new cases per 100,000) (Table A3.49).

In 2001–2005, the incidence of breast cancer per 100,000 among Indigenous women aged 50–74 was 216.8, rising to 233.1 in 2011–2015 (Table A3.50).

Breast cancer survival

In 2011–2015, Indigenous women diagnosed with breast cancer had a 75.6% chance of surviving for 5 years, compared with their counterparts in the general population (Table A2.5). For Indigenous women in the target age group (50–74 years), 5-year observed survival was 78.1%.

The 5-year observed survival rate from breast cancer was highest for Indigenous women aged 50–54 (81.6%) and lowest for those aged 75 and over (57.7%) and under 40 (65.5%) (Table A2.5).

Observed survival from breast cancer for Indigenous women aged 50–74 has improved over time. Since 2001–2005, the 5-year observed survival rate rose from 73.1% to 78.1% in 2011–2015 (Table A2.4).

Box 5.1: Reporting Indigenous survival 2011–2015

Incidence data for 2016 for the Northern Territory were not available in time for inclusion in the 2016 ACD. As the Northern Territory contains about 10% of Australia's Indigenous population, survival statistics by Indigenous status are reported for the period 2011–2015 instead of 2012–2016.

Mortality from breast cancer

Breast cancer mortality data by Indigenous status are available for 5 jurisdictions—New South Wales, Queensland, Western Australia, South Australia and the Northern Territory. Data from these jurisdictions were considered to have adequate levels of Indigenous identification when this report was prepared.

In the 5-year period from 2014 to 2018, in these jurisdictions, there were 189 deaths from breast cancer among Indigenous women (Table A3.59). Of these, 116 (61.4%) were women aged 50–74. This is equivalent to a crude rate of 43.8 deaths per 100,000 Indigenous women aged 50–74 in the population (Table A3.60). The death rate from breast cancer was highest among Indigenous women aged 75 and older (136.6 per 100,000).

In the jurisdictions for which data were available, the crude rates of death from breast cancer in 2014–2018 were highest for Indigenous women aged 50–74 living in *Inner regional* and *Outer regional* areas (44.7 per 100,000) (Table A3.64).

In recent years, the crude mortality rate per 100,000 from breast cancer among Indigenous women aged 50–74 has fallen in these jurisdictions, from 49.2 in 2004–2008 to 42.0 in 2009–2013 and 43.8 in 2014–2018 (Table A3.66).

BreastScreen Australia performance indicators

Indigenous women aged 50–74 had a lower age-standardised participation rate (37.6%) than non-Indigenous women (54.4%) (Table 5.3) and a lower incidence rate of breast cancer (250.5 compared with 302.6 per 100,000); however, Indigenous women had a higher mortality rate (47.4 compared with 41.8 per 100,000).

Table 5.3: Summary of performance indicators for Indigenous and non-Indigenous women aged 50–74

Indicator		Indigenous	Non-Indigenous	Indigenous compared to non-Indigenous
PI1	Participation	37.6%	54.4%	Lower
PI7a	Breast cancer incidence	250.5 per 100,000	302.6 per 100,000	Lower
PI8	Breast cancer mortality	47.4 per 100,000	41.8 per 100,000	Higher

Notes

1. The participation indicator PI1 is reported for the period 2017–2018. The incidence indicator PI7 is reported for the period 2011–2015. The mortality indicator PI8 is reported for 2014–2018. Rates are age-standardised to assist in comparisons across population groups.
2. Indicators PI2 (rescreening), PI3 (recall to assessment), PI4 (invasive breast cancer detection), PI5 (DCIS detection), PI6a (interval cancers), PI6b (program sensitivity) and PI7b (DCIS incidence) are not reported due to data incompleteness or unavailability.

Sources: AIHW analysis of BreastScreen Australia data; AIHW Australian Cancer Database 2016; AIHW National Mortality Database.

5.4 Language spoken at home

Women aged 50–74 who spoke a language other than English at home had a lower participation rate than those who spoke English (45.4% compared with 56.3%) (Table 5.4).

Table 5.4: Summary of performance indicators by main language spoken at home for women aged 50–74

Indicator		Non-English speaking	English speaking	Non-English compared to English
PI1	Participation	45.4%	56.3%	Lower

Notes

1. The participation indicator PI1 is reported for the period 2017–2018. Rates are age-standardised to assist in comparisons across population groups.
2. Indicators PI2 (rescreening), PI3 (recall to assessment), PI4 (invasive breast cancer detection), PI5 (DCIS detection), PI6a (interval cancers), PI6b (program sensitivity), PI7a (breast cancer incidence), PI7b (DCIS incidence) and PI8 (mortality) are not reported due to data incompleteness or unavailability.

Source: AIHW analysis of BreastScreen Australia data.

Appendix A: Supporting data tables

Additional table for Chapter 1

Table A1.1: Government funding for cancer screening programs, 2017–18 ($ million)

Screening program	Australian Government	State and territory governments	Total government
BreastScreen Australia[(a)]	3.3[(b)]	261.5	264.8
National Cervical Screening Program[(c)]	60.2	34.6	94.8
MBS items for cervical screening	*45.8*		
PIP incentive payments for cervical screening	*4.2*		
Assist Victoria in funding the Victorian Cytology Service	*10.2*		
National Bowel Cancer Screening Program[(d)(e)]	75.3	0.0	75.3
Total	**138.8**	**296.1**	**434.9**

(a) Excludes Medical Benefits Schedule (MBS) items for breast cancer screening that occurs outside BreastScreen Australia.

(a) For the BreastScreen Australia program, the Australian Government figure includes only direct expenditure on the program by the government, and not the funding provided to the states and territories through the National Health Reform Agreement.

(b) Excludes the proportion of the costs associated with general practitioner, specialist and nurse attendances that would have been for Pap smears.

(c) Excludes MBS items for bowel screening that occurs outside the National Bowel Cancer Screening Program (NBCSP).

(d) Includes payments from the Australian Government to the states and territories for the NBCSP.

Sources: AIHW Health Expenditure database; Services Australia Medicare statistics.

Additional tables for Chapter 2

Table A2.1: Five-year relative survival from breast cancer in females, by age group, 2012–2016

Age group (years)	5-year relative survival (%)
<20	n.p.
20–24	89.5
25–29	89.1
30–34	87.0
35–39	90.6
40–44	92.8
45–49	93.9
50–54	92.9
55–59	92.9
60–64	93.6
65–69	94.1
70–74	91.4
75+	81.3
All ages	91.1
Ages 50–74	**93.1**

n.p. = not published

Note: Relative survival was calculated with the period method, using the period 2012–2016 (Brenner & Gefeller 1996). Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016.

Table A2.2: Trend in 5-year relative survival from breast cancer in women aged 50–74, 1987–1991 to 2012–2016

Year	5-year relative survival (%)
1987–1991	75.1
1992–1996	82.3
1997–2001	87.8
2002–2006	90.4
2007–2011	91.6
2012–2016	93.1

Note: Relative survival was calculated with the period method, using the period 2012–2016 (Brenner & Gefeller 1996). Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016.

Table A2.3: Relative survival at diagnosis and 5-year conditional survival from breast cancer in women aged 50–74, 2012–2016

	Relative survival	Conditional survival	
Years after diagnosis	Relative survival (%)	Years already survived	5-year conditional relative survival (%)
1	98.8	. .	. .
2	97.5	. .	. .
3	95.9	. .	. .
4	94.4	. .	. .
5	93.1	0	93.1
6	92.0	1	93.2
7	91.1	2	93.5
8	90.2	3	94.0
9	89.2	4	94.4
10	88.3	5	94.8
11	87.4	6	94.9
12	86.8	7	95.2
13	85.9	8	95.3
14	85.1	9	95.5
15	84.4	10	95.6
16	83.5	11	95.6
17	82.9	12	95.5
18	82.0	13	95.4
19	81.3	14	95.6
20	80.6	15	95.5

Note: Relative survival was calculated with the period method, using the period 2012–2016 (Brenner & Gefeller 1996). Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016.

Table A2.4: Five-year observed survival from breast cancer, women aged 50–74, by Indigenous status, 2001–2005 to 2011–2015[(a)]

	Indigenous			Non-Indigenous		
Year	Survival (%)	Lower[(b)]	Upper[(c)]	Survival (%)	Lower[(b)]	Upper[(c)]
2001–2005	73.1	66.1	78.9	86.1	85.5	86.6
2006–2010	72.6	67.1	77.3	88.1	87.6	88.5
2011–2015	78.1	73.8	81.7	89.5	89.1	89.9

(a) Survival was calculated using the period method.

(b) Lower bound of 95% confidence interval for survival estimate.

(c) Upper bound of 95% confidence interval for survival estimate.

Notes

1. Incidence data for 2016 for NT were not available in time for inclusion in the 2016 ACD. As the NT contains about 10% of Australia's Indigenous population, survival statistics stratified by Indigenous status are reported for the period 2011–2015 instead of 2012–2016.
2. Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Source: AIHW Australian Cancer Database 2016.

Table A2.5: Five-year observed survival from breast cancer in females, by Indigenous status and by age group 2011–2015(a)

	Indigenous			Non-Indigenous		
Age group (years)	**Survival (%)**	**Lower(b)**	**Upper(c)**	**Survival (%)**	**Lower(b)**	**Upper(c)**
<40	65.5	50.8	76.7	90.1	88.9	91.3
40–44	80.9	70.3	88.0	91.9	90.8	92.8
45–49	77.2	67.4	84.4	92.6	91.8	93.3
50–54	81.6	73.0	87.6	91.4	90.7	92.1
55–59	73.7	63.8	81.3	90.8	90.0	91.6
60–64	80.0	70.4	86.8	90.5	89.7	91.2
65–69	77.1	66.3	84.8	89.4	88.5	90.2
70–74	75.8	59.2	86.3	83.3	82.0	84.4
75+	57.7	44.2	69.1	57.2	56.1	58.3
All ages	75.6	72.3	78.6	84.6	84.3	84.9
Ages 50–74	**78.1**	**73.8**	**81.7**	**89.5**	**89.1**	**89.9**

(a) Survival was calculated using the period method.

(b) Lower bound of 95% confidence interval for survival estimate.

(c) Upper bound of 95% confidence interval for survival estimate.

Notes

1. Incidence data for 2016 for NT were not available in time for inclusion in the 2016 ACD. As the NT contains about 10% of Australia's Indigenous population, survival statistics stratified by Indigenous status are reported for the period 2011–2015 instead of 2012–2016.
2. Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Source: AIHW Australian Cancer Database 2016.

Table A2.6: Long-term conditional 5-year observed survival from breast cancer, women aged 50–74, by Indigenous status, 2011–2015[(a)]

	Indigenous			Non-Indigenous		
Years survived since diagnosis	Conditional 5-year observed survival (%)	Lower[(b)]	Upper[(c)]	Conditional 5-year observed survival (%)	Lower[(b)]	Upper[(c)]
1	79.3	74.9	83.0	89.4	89.0	89.8
2	80.0	75.2	83.9	89.5	89.1	89.9
3	81.1	76.0	85.3	89.6	89.2	90.0
4	78.1	72.2	82.8	89.5	89.1	89.9
5	80.2	74.1	84.9	89.5	89.1	90.0
6	79.0	72.6	84.1	89.0	88.5	89.4
7	79.9	73.2	85.0	88.4	87.9	88.9
8	75.8	68.3	81.7	87.7	87.2	88.2
9	70.8	62.0	78.0	87.2	86.6	87.7
10	63.2	52.8	71.8	86.2	85.6	86.8
11	64.0	52.9	73.1	85.3	84.6	86.0
12	66.9	55.4	76.0	84.5	83.6	85.3
13	n.p.	n.p.	n.p.	83.6	82.5	84.6
14	n.p.	n.p.	n.p.	82.3	80.9	83.6
15	n.p.	n.p.	n.p.	81.7	80.0	83.3

n.p. Not published due to insufficient number of surviving cases to calculate reliable estimate of survival.

(a) Survival was calculated using the period method.

(b) Lower bound of 95% confidence interval for survival estimate.

(c) Upper bound of 95% confidence interval for survival estimate.

Notes

1. Incidence data for 2016 for NT were not available in time for inclusion in the 2016 ACD. As the NT contains about 10% of Australia's Indigenous population, survival statistics stratified by Indigenous status are reported for the period 2011–2015 instead of 2012–2016.
2. Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Source: AIHW Australian Cancer Database 2016.

Table A2.7: Duration of observed survival from breast cancer, women aged 50–74, by Indigenous status, 2011–2015[(a)]

	Indigenous			Non-Indigenous		
Duration, d	d-year observed survival (%)	Lower[(b)]	Upper[(c)]	d-year observed survival (%)	Lower[(b)]	Upper[(c)]
1	95.8	93.5	97.3	98.1	97.9	98.2
2	89.9	86.8	92.3	96.0	95.8	96.2
3	85.4	81.8	88.3	93.7	93.4	94.0
4	82.2	78.3	85.5	91.5	91.2	91.8
5	78.1	73.8	81.7	89.5	89.1	89.9
6	76.0	71.5	79.8	87.7	87.3	88.1
7	71.9	67.1	76.1	85.9	85.5	86.3
8	69.3	64.2	73.7	84.0	83.5	84.5
9	64.2	58.8	69.1	81.9	81.4	82.4
10	62.6	57.1	67.6	80.1	79.6	80.6
11	60.0	54.4	65.2	78.0	77.5	78.5
12	57.4	51.6	62.8	76.0	75.4	76.5
13	52.5	46.5	58.2	73.7	73.1	74.3
14	45.4	39.1	51.6	71.4	70.8	72.1
15	39.5	32.7	46.3	69.1	68.4	69.8
16	38.4	31.4	45.3	66.6	65.8	67.3
17	38.4	31.4	45.3	64.2	63.4	65.0
18	n.p.	n.p.	n.p.	61.6	60.6	62.5
19	n.p.	n.p.	n.p.	58.8	57.7	59.9
20	n.p.	n.p.	n.p.	56.5	55.2	57.7

(a) Survival was calculated using the period method.

(b) Lower bound of 95% confidence interval for survival estimate.

(c) Upper bound of 95% confidence interval for survival estimate.

Notes

1. Incidence data for 2016 for NT were not available in time for inclusion in the 2016 ACD. As the NT contains about 10% of Australia’s Indigenous population, survival statistics stratified by Indigenous status are reported for the period 2011–2015 instead of 2012–2016.
2. Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Source: AIHW Australian Cancer Database 2016.

Additional tables for Chapter 3

A1 Participation

Table A3.1: Participation of women aged 50–69 in BreastScreen Australia, 1996–1997 to 2017–2018

Reporting period	Participants[(a)]	Population[(b)]	Crude rate[(c)]	AS rate[(d)]
1996–1997	845,143	1,637,010	51.6	51.7
1997–1998	927,735	1,691,811	54.8	54.9
1998–1999	976,182	1,744,201	56.0	56.0
1999–2000	1,012,184	1,798,652	56.3	56.3
2000–2001	1,064,246	1,856,598	57.3	57.3
2001–2002	1,102,642	1,915,145	57.6	57.6
2002–2003	1,118,823	1,974,192	56.7	56.6
2003–2004	1,145,008	2,033,831	56.3	56.2
2004–2005	1,188,955	2,094,183	56.8	56.7
2005–2006	1,242,210	2,155,430	57.6	57.5
2006–2007	1,262,334	2,217,714	56.9	56.7
2007–2008	1,273,317	2,282,672	55.8	55.5
2008–2009	1,319,771	2,349,050	56.2	55.9
2009–2010	1,352,112	2,416,676	55.9	55.6
2010–2011	1,373,731	2,487,062	55.2	54.8
2011–2012	1,407,065	2,557,284	55.0	54.6
2012–2013	1,439,748	2,624,718	54.9	54.4
2013–2014	1,456,822	2,687,296	54.2	53.7
2014–2015	1,493,154	2,741,853	54.5	53.9
2015–2016	1,537,437	2,789,512	55.1	54.6
2016–2017	1,554,129	2,826,874	55.0	54.4
2017–2018	1,560,982	2,855,958	54.7	54.1

(a) ‘Participants’ are the number of women aged 50–69 screened through BreastScreen Australia in each 2-year reporting period. The reporting periods cover 1 January of the initial year to 31 December of the latter year indicated.

(b) ‘Population’ is the average of the ABS estimated resident population, for women aged 50–69, for the 2 reporting years.

(c) ‘Crude rate’ is the number of women aged 50–69 screened in each 2-year reporting period, as a percentage of the ABS estimated resident population.

(d) ‘Age-standardised (AS) rate’ is the number of women aged 50–69 screened in each 2-year reporting period, as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.2: BreastScreen Australia participation, by age group, 2017–2018

Age group (years)	Number	Crude rate
40–44	81,361	10.1
45–49	149,120	17.6
50–54	386,784	49.6
55–59	407,748	52.7
60–64	399,600	57.9
65–69	366,850	59.9
70–74	280,351	55.8
75+	71,125	7.6

Note: 'Crude rate' is the number of women screened in 2017–2018, as a percentage of the ABS estimated resident population.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.3: BreastScreen Australia participation, by state and territory, women aged 50–69 and women aged 50–74, 2017–2018

	Age group (years)					
	50–69			50–74		
State and territory	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
NSW	488,682	53.4	52.7	579,017	53.7	53.1
Vic	389,129	54.2	53.8	456,526	54.1	53.7
Qld	315,890	54.9	54.3	372,916	55.1	54.6
WA	161,805	55.5	54.9	189,156	55.8	55.4
SA	128,485	59.2	58.3	153,694	59.5	58.7
Tas	43,303	60.3	59.4	51,389	60.1	59.3
ACT	24,808	56.9	56.4	28,911	56.9	56.4
NT	8,880	38.4	38.4	9,724	38.4	38.4
Australia	**1,560,982**	**54.7**	**54.1**	**1,841,333**	**54.8**	**54.3**

Notes

1. 'Crude rate' is the number of women screened in 2017–2018, as a percentage of the ABS estimated resident population; 'age-standardised (AS) rate' is the number of women screened in 2017–2018, as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
2. Direct comparisons between the states and territories of Australia are not advised, due to the substantial differences that exist between the jurisdictions including for population, geographical size and structure, policies and other factors.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.4: BreastScreen Australia participation, by month, women aged 50–74, 2017 and 2018

	Year	
Month	**2017**	**2018**
January	55,810	73,744
February	74,184	82,210
March	79,142	82,377
April	60,423	74,538
May	84,825	94,314
June	76,986	81,581
July	75,179	84,060
August	81,706	90,321
September	73,214	78,393
October	79,837	90,458
November	79,258	87,358
December	49,250	52,165

Note: Participation numbers are numbers of women aged 50–74 screened through BreastScreen Australia between 1 January 2017 and 31 December 2017, and between 1 January 2018 and 31 December 2018.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.5: BreastScreen Australia participation, by remoteness area, women aged 50–69 and women aged 50–74, 2017–2018

	Age group (years)					
	50–69			50–74		
Remoteness area	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
Major cities	1,040,851	53.5	53.0	1,220,948	53.5	53.2
Inner regional	339,582	57.5	56.4	408,011	57.8	56.8
Outer regional	153,383	57.7	56.8	181,355	57.9	57.2
Remote	17,323	53.0	52.6	20,013	53.5	53.2
Very Remote	8,275	42.9	42.9	9,222	43.2	43.3
Australia[(a)]	**1,560,982**	**54.7**	**54.1**	**1,841,333**	**54.8**	**54.3**

(a) Includes women in the 'not stated' category; therefore, columns may not sum to the Australia column.

Notes

1. 'Crude rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population; 'age-standardised (AS) rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
2. Remoteness areas were assigned using the woman's residential postcode according to the Australian Statistical Geography Standard (ASGS) for 2016. Not all postcodes can be assigned to a remoteness area, therefore categories do not add exactly to the total for Australia. Caution is required when examining differences across remoteness areas (see Appendix D).

Source: AIHW analysis of BreastScreen Australia data.

Table A3.6: BreastScreen Australia participation, by socioeconomic area, women aged 50–69 and women aged 50–74, 2017–2018

	Age group (years)					
	50–69			50–74		
Socioeconomic area	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
1 (lowest)	303,607	52.7	51.8	361,828	52.9	52.1
2	327,891	55.6	54.8	390,440	55.9	55.2
3	302,856	54.4	53.8	356,233	54.5	54.0
4	310,183	55.5	55.0	362,323	55.5	55.2
5 (highest)	314,865	54.8	54.5	368,716	54.9	54.6
Australia[(a)]	**1,560,982**	**54.7**	**54.1**	**1,841,333**	**54.8**	**54.3**

(a) Includes women in the 'not stated' category; therefore, columns may not sum to the Australia column.

Notes

1. 'Crude rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population; 'age-standardised (AS) rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
2. Women were allocated to a socioeconomic area using their residential postcode according to the Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Disadvantage for 2016. Not all postcodes can be assigned to a socioeconomic area, therefore categories do not add exactly to the total for Australia. Caution is required when examining differences across socioeconomic areas (see Appendix D).

Source: AIHW analysis of BreastScreen Australia data.

Table A3.7: BreastScreen Australia participation, by main language spoken at home, women aged 50–69 and women aged 50–74, 2017–2018

	Age group (years)					
	50–69			50–74		
Main language spoken at home	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
English-speaking	1,309,217	56.6	56.0	1,551,702	56.8	56.3
Non-English-speaking	249,103	45.8	45.4	286,647	45.8	45.4
Australia[(a)]	**1,560,982**	**54.7**	**54.1**	**1,841,333**	**54.8**	**54.3**

(a) Includes women in the 'not stated' category for main language other than English spoken at home; therefore, columns may not sum to the Australia column.

Notes

1. Some jurisdictions do not use the 'not stated' category, and there may also be differences in how these data are collected. This means that the analysis based on main language spoken at home should be interpreted with caution.
2. 'Crude rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population; 'age-standardised (AS) rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.8: BreastScreen Australia participation, by Indigenous status, women aged 50–69 and women aged 50–74, 2017–2018

	Age group (years)					
	50–69			50–74		
Indigenous status	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
Indigenous	21,875	37.1	37.4	24,001	37.3	37.6
Non-Indigenous	1,532,949	54.8	54.2	1,810,553	55.0	54.4
Australia[(a)]	**1,560,982**	**54.7**	**54.1**	**1,841,333**	**54.8**	**54.3**

(a) Includes women with a 'not stated 'Indigenous status; therefore, columns may not sum to the Australia column.

Notes

1. Indigenous status is self-reported; therefore, accuracy of Indigenous participation rates will be affected if women choose not to identify as Indigenous at the time of screening.
2. 'Crude rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population; 'age-standardised (AS) rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.9: BreastScreen Australia participation, by Indigenous status and age group, 2017–2018

	Indigenous		Non-Indigenous	
Age group (years)	**Number**	**Crude rate**	**Number**	**Crude rate**
40–44	2,224	10.1	78,250	10.0
45–49	3,682	15.5	144,307	17.5
50–54	6,550	32.4	377,280	49.6
55–59	6,215	36.4	400,110	52.9
60–64	5,238	41.3	393,406	58.1
65–69	3,872	43.5	362,153	60.1
70–74	2,126	39.2	277,604	55.8
75+	523	8.5	70,388	7.7
40+	**30,430**	**26.2**	**2,103,498**	**36.2**

Notes

1. Indigenous status is self-reported; therefore, accuracy of Indigenous participation rates will be affected if women choose not to identify as Indigenous at the time of screening.
2. 'Crude rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.10: Number of women participating in BreastScreen Australia, by Indigenous status, age group and by state and territory, 2017–2018

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Indigenous									
40–49	1,317	251	2,783	622	203	330	34	366	5,906
50–59	4,380	842	4,063	1,288	663	519	116	894	12,765
60–69	3,287	607	2,889	891	434	339	77	586	9,110
70–74	756	149	702	191	102	96	18	112	2,126
75+	166	26	184	81	30	9	5	22	523
40+	9,906	1,875	10,621	3,073	1,432	1,293	250	1,980	30,430
50–69	7,667	1,449	6,952	2,179	1,097	858	193	1,480	21,875
50–74	**8,423**	**1,598**	**7,654**	**2,370**	**1,199**	**954**	**211**	**1,592**	**24,001**
Non-Indigenous									
40–49	41,344	37,287	84,120	27,755	17,184	10,359	3,495	1,013	222,557
50–59	238,671	198,903	158,061	81,905	62,554	20,447	12,664	4,185	777,390
60–69	239,914	186,437	149,970	77,721	64,730	21,734	11,838	3,215	755,559
70–74	89,469	67,131	55,960	27,160	25,093	7,980	4,079	732	277,604
75+	18,764	14,960	17,454	8,948	8,151	1,069	887	155	70,388
40+	628,162	504,718	465,565	223,489	177,712	61,589	32,963	9,300	2,103,498
50–59	478,585	385,340	308,031	159,626	127,284	42,181	24,502	7,400	1,532,949
50–74	**568,054**	**452,471**	**363,991**	**186,786**	**152,377**	**50,161**	**28,581**	**8,132**	**1,810,553**

Notes

1. Indigenous status is self-reported; therefore, accuracy of Indigenous participation rates will be affected if women choose not to identify as Indigenous at the time of screening.
2. Participation numbers are numbers of women screened through BreastScreen Australia in 2017–2018.
3. Direct comparisons between the states and territories of Australia are not advised, due to the substantial differences that exist between the jurisdictions including for population, geographical size and structure, policies and other factors.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.11: BreastScreen Australia participation, by Indigenous status, age group and by state and territory, 2017–2018

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Indigenous									
40–49	8.8	8.1	22.1	10.7	8.4	20.4	8.3	7.6	12.9
50–59	34.6	33.1	41.4	27.1	33.0	35.1	31.8	24.4	34.2
60–69	44.5	37.7	50.1	33.0	39.7	39.4	46.2	29.4	42.2
70–74	38.4	38.1	49.1	30.7	35.9	43.0	48.0	24.3	39.2
75+	7.3	5.1	12.0	11.9	9.4	3.2	12.7	4.1	8.5
40+ ASR(a)	25.9	23.6	35.0	21.8	24.1	28.6	26.9	18.0	26.9
50–69 ASR	38.5	35.0	44.8	29.4	35.6	36.7	37.4	26.4	37.4
50–74 ASR	**38.5**	**35.5**	**45.4**	**29.6**	**35.6**	**37.6**	**38.9**	**26.1**	**37.6**
Non-Indigenous									
40–49	8.2	8.8	25.8	16.5	15.8	32.3	12.5	8.6	13.9
50–59	49.5	51.1	51.7	52.4	55.5	57.1	52.9	39.6	51.3
60–69	58.1	57.4	58.9	60.8	64.1	64.5	61.9	46.5	59.0
70–74	55.2	53.5	56.2	58.3	61.2	59.4	56.7	41.4	55.8
75+	6.1	6.2	10.4	10.6	10.3	4.6	7.5	7.4	7.7
40+ ASR(a)	31.6	32.0	39.3	36.8	37.7	43.2	35.6	27.8	34.5
50–59 ASR	52.8	53.5	54.4	55.6	58.6	59.8	56.4	42.2	54.2
50–74 ASR	**53.1**	**53.5**	**54.6**	**56.0**	**59.0**	**59.7**	**56.4**	**42.1**	**54.4**

(a) Rates are directly age-standardised to the Australian 2001 standard population in 5-year age groups up to 65+. This can result in small differences between these data and data in other tables, which are age-standardised to 75+.

Notes

1. ‘Crude rate’ is the number of women screened in 2017–2018, as a percentage of the ABS estimated resident population; ‘age-standardised rate (ASR)’ is the number of women screened in 2017–2018, as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
2. Direct comparisons between the states and territories of Australia are not advised, due to the substantial differences that exist between the jurisdictions including for population, geographical size and structure, policies and other factors.
3. Indigenous status is self reported; therefore, accuracy of Indigenous participation rates will be affected if women choose not to identify as Indigenous at the time of screening.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.12: Number of women participating in BreastScreen Australia, by Indigenous status, age group and remoteness, 2017–2018

Age group (years)	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
Indigenous					
40–49	1,772	1,339	1,417	463	909
50–59	4,355	3,216	2,821	922	1,441
60–69	3,152	2,390	2,064	595	904
70–74	717	562	511	131	203
75+	157	120	106	52	86
40+	10,153	7,627	6,920	2,164	3,543
50–69	7,508	5,606	4,886	1,517	2,345
50–74	**8,225**	**6,168**	**5,397**	**1,649**	**2,548**
Non-Indigenous					
40–49	149,408	42,641	25,137	3,656	1,656
50–59	534,858	157,944	72,701	8,424	3,320
60–69	495,381	174,811	75,209	7,395	2,636
70–74	179,093	67,756	27,420	2,558	745
75+	43,513	16,760	8,680	1,113	308
40+	1,402,253	459,911	209,147	23,146	8,665
50–59	1,030,239	332,755	147,910	15,820	5,957
50–74	**1,209,332**	**400,510**	**175,330**	**18,378**	**6,702**

Notes

1. Participation numbers are numbers of women screened through BreastScreen Australia in 2017–2018.
2. Remoteness areas were assigned using the woman's residential postcode according to the Australian Statistical Geography Standard (ASGS) for 2016. Caution is required when examining differences across remoteness areas (see Appendix D).
3. Indigenous status is self reported; therefore, accuracy of Indigenous participation rates will be affected if women choose not to identify as Indigenous at the time of screening.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.13: BreastScreen Australia participation, by Indigenous status, age group and remoteness, 2017–2018

Age group (years)	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
Indigenous					
40–49	10.7	12.8	15.2	13.4	15.5
50–59	33.2	37.3	36.0	29.6	31.4
60–69	41.6	48.1	42.0	35.2	37.3
70–74	38.0	43.0	41.0	33.9	34.4
75+	7.0	7.9	7.7	11.7	15.2
40+ ASR[(a)]	25.4	29.2	28.2	24.1	26.4
50–69 ASR	36.5	41.5	38.3	31.8	33.9
50–74 crude rate	36.4	41.4	38.5	31.8	33.5
50–74 ASR	**36.7**	**41.7**	**38.7**	**32.1**	**33.9**
Non-Indigenous					
40–49	12.6	15.5	20.7	23.9	28.6
50–59	50.3	53.2	54.1	52.8	51.1
60–69	57.5	62.3	61.9	59.7	55.7
70–74	54.0	59.5	59.3	58.8	54.1
75+	6.8	8.3	10.9	16.3	16.9
40+ ASR(a)	33.2	36.6	39.0	40.3	41.1
50–59 ASR	53.1	56.5	56.9	55.4	53.0
50–74 crude rate	53.6	57.9	58.0	56.2	53.1
50–74 ASR	**53.2**	**56.9**	**57.3**	**55.9**	**53.1**

(a) Rates are directly age-standardised to the Australian 2001 standard population in 5-year age groups up to 65+. This can result in small differences between these data and data in other tables, which are age-standardised to 75+.

Notes

1. 'Crude rate' is the number of women screened in 2017–2018 as a percentage of the ABS estimated resident population; 'age-standardised rate (ASR)' is the number of women screened in 2017–2018, as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
2. Remoteness areas were assigned using the woman's residential postcode according to the Australian Statistical Geography Standard (ASGS) for 2016. Caution is required when examining differences across remoteness areas (see Appendix D).
3. Indigenous status is self reported; therefore, accuracy of Indigenous participation rates will be affected if women choose not to identify as Indigenous at the time of screening.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.14: Number and age-standardised rate of women aged 50–69 participating in BreastScreen Australia, by Indigenous status, 1996–1997 to 2017–2018

Reporting period	Indigenous participants	Indigenous crude rate	Indigenous AS rate	Non-Indigenous participants	Non-Indigenous crude rate	Non-Indigenous AS rate
1996–1997	4,660	25.0	25.0	643,182	39.7	39.8
1997–1998	5,398	27.8	27.8	713,175	42.6	42.7
1998–1999	5,965	29.3	29.4	748,367	43.4	43.4
1999–2000	6,479	30.4	30.5	773,574	43.5	43.5
2000–2001	7,011	31.4	31.5	813,461	44.3	44.4
2001–2002	7,504	30.5	30.9	849,334	44.9	44.9
2002–2003	7,985	30.6	31.0	985,439	50.6	50.5
2003–2004	8,132	29.3	29.9	1,131,173	56.4	56.3
2004–2005	8,595	29.3	29.9	1,175,197	56.9	56.8
2005–2006	9,284	29.8	30.5	1,226,306	57.7	57.6
2006–2007	9,720	29.3	30.0	1,246,513	57.1	56.9
2007–2008	10,294	29.3	30.0	1,256,472	55.9	55.6
2008–2009	10,902	29.2	29.8	1,302,050	56.3	56.0
2009–2010	11,374	28.7	29.4	1,332,597	56.1	55.7
2010–2011	11,971	28.5	29.1	1,341,869	54.9	54.5
2011–2012	13,164	29.7	30.2	1,384,064	55.1	54.6
2012–2013	14,786	31.6	32.1	1,418,450	55.0	54.6
2013–2014	15,969	32.4	32.8	1,434,926	54.4	53.9
2014–2015	17,210	33.3	33.6	1,468,798	54.7	54.1
2015–2016	18,890	34.9	35.2	1,511,138	55.3	54.7
2016–2017	20,374	36.1	36.3	1,520,265	54.9	54.3
2017–2018	21,875	37.1	37.4	1,532,949	54.8	54.2

Notes

1. Indigenous status is self-reported; therefore, accuracy of Indigenous participation rates will be affected if women choose not to identify as Indigenous at the time of screening.
2. ‘Crude rate’ is the number of women screened as a percentage of the ABS estimated resident population; ‘age-standardised (AS) rate’ is the number of women screened as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
3. The reporting periods cover 1 January of the initial year to 31 December of the latter year indicated.
4. The participation data from 2001–2002 to 2016–2017 have been updated. Therefore, these data may differ from previously published data.

Source: AIHW analysis of BreastScreen Australia data.

A2 Rescreening

Table A3.15: Rescreening, by screening round, women aged 50–67, 2006 to 2016

	First screening round	Second screening round	Third and subsequent screening rounds
Year	**AS rate**	**AS rate**	**AS rate**
2006	49.9	58.5	73.5
2007	55.9	62.6	76.1
2008	59.9	71.2	81.6
2009	59.4	69.8	82.3
2010	58.3	67.8	82.8
2011	59.6	67.8	81.6
2012	56.4	65.5	81.5
2013	57.2	66.8	83.1
2014	59.7	70.1	85.0
2015	60.6	69.8	84.5
2016	60.1	68.3	84.4

Note: 'Age-standardised (AS) rate' is the number of women rescreened within 27 months as a percentage of women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.16: Rescreening, by age group and screening round, women screened during 2016

	First screening round	Second screening round	Third and subsequent screening rounds
Age group (years)	**Crude rate**	**Crude rate**	**Crude rate**
40–49	42.0	62.6	78.9
50–72	61.6	70.6	84.8
75+	18.5	30.8	43.3

Note: 'Crude rate' is the number of women rescreened within 27 months as a percentage of women screened.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.17: Rescreening, by state and territory and screening round, women aged 50–67 and women aged 50–72 screened during 2016

	First screening round		Second screening round		Third and subsequent screening rounds	
State and territory	**Crude rate**	**AS rate**	**Crude rate**	**AS rate**	**Crude rate**	**AS rate**
50–67 years						
NSW	64.9	62.7	73.2	70.9	85.6	85.2
Vic	62.1	59.6	74.0	70.4	86.3	86.3
Qld	57.7	58.7	65.8	65.7	83.1	82.8
WA	50.9	49.0	61.9	58.9	80.3	79.8
SA	62.9	60.8	70.5	66.6	87.6	87.5
Tas	70.0	70.5	77.1	77.3	88.3	88.1
ACT	56.3	57.2	64.4	62.7	81.1	80.7
NT	47.6	47.7	58.7	57.1	76.3	76.4
Australia	61.5	60.1	70.8	68.3	84.8	84.4
50–72 years						
NSW	64.9	62.8	73.0	70.6	85.6	85.3
Vic	62.1	60.0	73.7	69.7	86.0	86.2
Qld	58.6	60.0	66.1	66.1	83.3	82.9
WA	51.0	49.5	61.8	59.0	80.6	80.1
SA	63.0	61.3	70.2	66.1	87.3	87.3
Tas	70.1	70.7	76.8	76.8	87.9	87.9
ACT	56.3	57.2	64.3	62.6	81.7	81.0
NT	47.5	47.1	58.4	56.5	76.5	76.5
Australia	61.6	60.6	70.6	68.2	84.8	84.5

Note: 'Crude rate' is the number of women rescreened within 27 months as a percentage of women screened'; 'age-standardised (AS) rate' is the number of women rescreened within 27 months as a percentage of women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

A3 Recall to assessment

Table A3.18: Recall to assessment, women aged 50–69, first and subsequent screening rounds, 2008 to 2018

	First screening round			Subsequent screening rounds		
Year	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
2008	9,213	10.3	9.9	23,604	4.1	4.1
2009	9,454	11.2	10.7	25,164	4.1	4.2
2010	9,110	11.4	11.1	25,880	4.1	4.2
2011	8,420	11.1	10.7	24,022	3.7	3.8
2012	8,395	10.8	10.8	22,406	3.4	3.4
2013	10,214	11.9	11.6	25,681	3.9	3.9
2014	9,149	12.3	12.2	26,974	3.9	4.0
2015	9,475	11.8	11.7	26,655	3.8	3.8
2016	9,806	11.5	11.2	26,671	3.7	3.7
2017	9,513	11.2	11.2	25,346	3.5	3.5
2018	9,457	11.2	11.1	25,736	3.5	3.5

Note: ‘Crude rate’ is the number of women recalled for assessment as a percentage of women screened; ‘age-standardised (AS) rate’ is the number of women recalled for assessment as a percentage of women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.19: Recall to assessment, by age group, first and subsequent screening rounds, 2018

	First screening round		Subsequent screening rounds	
Age group (years)	**Number**	**Crude rate**	**Number**	**Crude rate**
40–44	2,479	9.1	682	4.9
45–49	2,705	10.8	2,609	5.0
50–54	6,133	11.4	5,849	4.0
55–59	1,731	10.9	6,604	3.3
60–64	956	10.6	6,611	3.3
65–69	637	11.5	6,672	3.5
70–74	337	12.8	5,495	3.7
75+	92	12.5	1,630	4.3

Note: ‘Crude rate’ is the number of women recalled for assessment as a percentage of women screened.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.20: Recall to assessment, by state and territory, women aged 50–69 and women aged 50–74, first and subsequent screening rounds, 2018

	First screening round			Subsequent screening rounds		
State and territory	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
50–69 years						
NSW	3,489	11.7	11.8	7,189	3.2	3.2
Vic	2,239	10.6	10.6	6,566	3.7	3.7
Qld	1,488	10.4	10.5	4,934	3.3	3.2
WA	819	9.7	9.0	2,449	3.1	3.1
SA	969	15.3	14.3	3,286	5.2	5.4
Tas	177	9.3	9.3	697	3.3	3.3
ACT	135	10.3	9.3	491	4.1	4.1
NT	141	14.6	13.6	124	3.6	3.7
Australia	**9,457**	**11.2**	**11.1**	**25,736**	**3.5**	**3.5**
50–74 years						
NSW	3,607	11.7	11.9	8,768	3.2	3.2
Vic	2,296	10.6	10.7	7,921	3.7	3.8
Qld	1,598	10.6	10.7	5,991	3.3	3.3
WA	846	9.7	9.1	2,949	3.1	3.1
SA	980	15.1	13.9	4,038	5.2	5.4
Tas	188	9.4	9.4	854	3.3	3.3
ACT	138	10.3	9.2	576	4.0	4.1
NT	141	14.4	12.7	134	3.4	3.6
Australia	**9,794**	**11.3**	**11.2**	**31,231**	**3.5**	**3.5**

Note: ‘Crude rate’ is the number of women recalled for assessment as a percentage of women screened; ‘age-standardised (AS) rate’ is the number of women recalled for assessment as a percentage of women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

A4 Invasive breast cancer detection

Table A3.21: All-size invasive breast cancer detection in women aged 50–69, first and subsequent screening rounds, 2008 to 2018

	First screening round			Subsequent screening rounds		
Year	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
2008	585	67.2	75.5	2,834	48.7	47.8
2009	549	65.2	79.5	2,859	46.8	45.4
2010	581	72.7	91.6	2,879	45.9	44.4
2011	537	70.7	82.1	2,862	44.4	42.9
2012	631	80.8	103.6	3,011	45.4	43.9
2013	715	83.1	107.9	3,279	49.4	47.6
2014	633	84.9	108.2	3,490	50.8	48.3
2015	643	80.1	102.4	3,491	49.2	46.7
2016	699	81.9	100.2	3,670	50.6	48.2
2017	754	88.7	104.3	3,561	49.4	46.9
2018	733	86.9	106.6	3,690	50.2	47.5

Note: 'Crude rate' is the number of women with all size invasive breast cancer detected per 10,000 women screened; 'age-standardised (AS) rate' is the number of women with all size invasive breast cancer detected per 10,000 women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.22: Small (≤15 mm) invasive breast cancer detection in women aged 50–69, all screening rounds, 2008 to 2018

	All screening rounds		
Year	**Number**	**Crude rate**	**AS rate**
2008	2,103	31.4	31.4
2009	2,132	30.7	30.5
2010	2,082	29.4	29.2
2011	2,077	28.8	28.4
2012	2,122	28.6	28.2
2013	2,317	30.9	30.4
2014	2,379	31.2	30.5
2015	2,430	30.7	30.0
2016	2,516	31.1	30.2
2017	2,489	30.9	30.1
2018	2,557	31.2	30.2

Note: 'Crude rate' is the number of women with small (≤15 mm) invasive breast cancer detected per 10,000 women screened; 'age-standardised (AS) rate' is the number of women with small (≤15 mm) invasive breast cancer detected per 10,000 women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.23: All-size and small (≤15 mm) invasive breast cancer detection, by age group, all screening rounds, 2018

	Size of breast cancer			
	All-size		Small (≤15 mm)	
Age group (years)	Number	Crude rate	Number	Crude rate
40–44	106	25.7	48	11.6
45–49	304	39.2	132	17.0
50–54	881	43.9	465	23.2
55–59	972	45.5	552	25.8
60–64	1,177	56.0	689	32.8
65–69	1,393	71.6	851	43.8
70–74	1,217	79.8	751	49.3
75+	461	118.9	257	66.3

Note: 'Crude rate' is the number of women with all-size and small (≤15 mm) invasive breast cancer detected per 10,000 women screened.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.24: Proportion of small (≤15 mm) invasive breast cancers detected in women aged 50–69, all screening rounds, 2008 to 2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Proportion (%)	61.5	62.6	60.2	61.1	58.3	58.0	57.7	58.8	57.6	57.7	57.8

Note: Figures are the number of women with small (≤15 mm) invasive breast cancer detected, as a proportion of the number of women with invasive breast cancer detected.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.25: All-size and small (≤15 mm) invasive breast cancer detection by state and territory, women aged 50–69 and women aged 50–74, first and subsequent screening rounds, 2018

	Size of breast cancer								
	All size						Small (≤15 mm)		
	First screening round			Subsequent screening rounds			All screening rounds		
State and territory	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
50–69 years									
NSW	269	90.0	109.8	1,098	48.4	44.9	726	28.3	27.3
Vic	169	79.8	111.3	887	50.0	48.0	612	30.8	30.0
Qld	142	99.5	115.3	810	53.5	51.2	552	33.3	32.3
WA	69	81.3	109.4	385	48.6	45.5	275	31.4	30.2
SA	47	74.1	72.1	320	50.9	48.0	240	34.7	33.7
Tas	19	100.2	102.1	105	49.1	46.1	93	40.0	38.3
ACT	8	61.2	48.1	68	56.4	54.7	49	36.7	35.7
NT	10	103.6	104.2	17	49.4	49.3	10	22.7	22.9
Australia	**733**	**86.9**	**106.6**	**3,690**	**50.2**	**47.5**	**2,557**	**31.2**	**30.2**
50–74 years									
NSW	285	92.7	114.9	1,461	53.2	47.0	967	31.7	28.8
Vic	185	85.5	126.9	1,180	55.6	50.3	804	34.4	31.6
Qld	155	103.1	118.8	1,033	57.0	52.7	682	34.7	33.0
WA	77	88.1	122.8	499	52.4	47.2	348	33.4	31.1
SA	49	75.5	76.4	438	56.9	50.4	318	38.1	35.0
Tas	19	95.2	95.4	139	53.7	48.1	120	43.0	39.6
ACT	9	66.9	62.6	83	57.9	55.4	58	37.0	35.9
NT	10	102.2	97.3	18	46.2	47.5	11	22.6	22.8
Australia	**789**	**90.7**	**113.5**	**4,851**	**54.8**	**49.5**	**3,308**	**34.0**	**31.5**

Notes

1. 'Crude rate' is the number of women with all size and small (≤15 mm) invasive breast cancer detected per 10,000 women screened; 'age-standardised (AS) rate' is the number of women with all size and small (≤15 mm) invasive breast cancer detected per 10,000 women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.
2. State and territory differences need to be taken into consideration when interpreting breast cancer detection results.
3. A small number of women may be screened in one jurisdiction but have their breast cancer detected in another.

Source: AIHW analysis of BreastScreen Australia data.

A5 Ductal carcinoma in situ detection

Table A3.26: DCIS detection, by year, women aged 50–69, first and subsequent screening rounds, 2008 to 2018

	First screening round			Subsequent screening rounds		
Year	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
2008	142	15.9	15.6	678	11.7	11.5
2009	152	18.0	19.6	723	11.8	11.7
2010	142	17.8	17.9	734	11.7	11.5
2011	141	18.6	20.9	740	11.5	11.2
2012	153	19.6	22.8	750	11.3	11.0
2013	207	24.1	29.2	876	13.2	12.8
2014	168	22.5	23.7	1,027	14.9	14.6
2015	179	22.3	24.5	918	12.9	12.5
2016	198	23.2	26.6	928	12.8	12.5
2017	203	23.9	27.7	836	11.6	11.3
2018	189	22.4	25.5	928	12.6	12.3

Note: 'Crude rate' is the number of women with DCIS detected per 10,000 women screened; 'age-standardised (AS) rate' is the number of women with DCIS detected per 10,000 women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.27: DCIS detection, by age group, all screening rounds, 2018

Age group (years)	Number	Crude rate
40–49	132	11.1
50–59	532	12.8
60–69	585	14.5
70–74	267	17.5
75+	67	17.3

Note: 'Crude rate' is the number of women with DCIS detected per 10,000 women screened.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.28: DCIS detection, by state and territory, women aged 50–69 and women aged 50–74, all screening rounds, 2018

	Age group (years)					
	50–69			50–74		
State and territory	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
NSW	315	12.3	12.3	397	13.0	12.6
Vic	305	15.4	15.2	367	15.7	15.4
Qld	227	13.7	13.5	284	14.5	13.9
WA	130	14.8	14.7	160	15.4	14.9
SA	80	11.6	11.4	101	12.1	11.6
Tas	31	13.3	13.2	40	14.3	13.6
ACT	24	18.0	17.9	29	18.5	18.2
NT	5	11.4	11.4	6	12.3	12.0
Australia	**1,117**	**13.6**	**13.5**	**1,384**	**14.2**	**13.8**

Notes

1. 'Crude rate' is the number of women with DCIS detected per 10,000 women screened; 'age-standardised (AS) rate' is the number of women with DCIS detected per 10,000 women screened, age-standardised to the population of women attending a BreastScreen Australia service in 2008. Rates based on numbers less than 20 should be interpreted with caution.
2. State and territory differences need to be taken into consideration when interpreting DCIS detection results.
3. A small number of women may be screened in one jurisdiction but have their DCIS detected in another.

Source: AIHW analysis of BreastScreen Australia data.

A6a Interval cancers

Box A1: Confidence intervals

Confidence intervals (CIs) are presented in this report only for interval cancer rates. This is because it is deemed important to show the degree of error due to rare events in small populations to avoid potential misinterpretation of data and/or to present data consistently with data in other publications.

Where shown, 95% CIs can be used to determine if a statistically significant difference exists between compared values: where the CIs do not overlap, the difference between rates is greater than that which could be explained by chance and is therefore regarded as statistically significant. Because overlapping CIs do not imply that the difference between 2 rates is definitely due to chance, it can only be stated that no statistically significant differences were found—and not that no differences exist.

Judgment should be exercised in deciding whether or not any differences shown are of clinical significance.

Table A3.29: Interval cancer rate for women aged 50–69 screened in index years 2013, 2014 and 2015, by state and territory, first and subsequent screening rounds, 0–12 months follow-up

	First screening round		Subsequent screening rounds	
State and territory	**AS rate**	**95% CI**	**AS rate**	**95% CI**
NSW	7.7	5.3–10.8	6.1	5.5–6.8
Vic	4.9	2.7–7.7	6.3	5.6–7.1
Qld	5.3	3.0–8.4	5.6	4.9–6.3
WA	4.9	2.1–9.2	6.4	5.4–7.6
SA	2.4	0.9–5.3	6.7	5.5–8.0
Tas	3.3	0.4–11.9	6.3	4.4–8.8
ACT	8.7	0.0–30.3	8.6	5.5–12.8
NT	2.4	0.1–13.1	4.1	1.1–10.4
Australia	**5.7**	**4.5–7.1**	**6.1**	**5.8–6.5**

Note: 'Age-standardised (AS) rate' is the number of interval cancers detected per 10,000 women-years, age-standardised to the population of women attending a BreastScreen Australia service in 2008; '95% CI' are 95% confidence intervals.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.30: Interval cancer rate for women aged 50–69 screened in index years 2013, 2014 and 2015, by state and territory, first and subsequent screening rounds, 13–24 months follow-up

	First screening round		Subsequent screening rounds	
State and territory	**AS rate**	**95% CI**	**AS rate**	**95% CI**
NSW	7.8	5.4–10.7	11.5	10.6–12.5
Vic	12.1	8.3–16.7	12.1	11.2–13.2
Qld	9.2	5.8–13.5	11.9	10.9–13.0
WA	12.9	6.6–21.4	12.8	11.3–14.6
SA	13.9	6.0–25.2	12.4	10.6–14.3
Tas	14.7	4.6–33.5	10.3	7.7–13.5
ACT	13.4	1.9–34.8	14.5	10.2–19.9
NT	4.1	0.1–22.8	10.6	4.3–21.8
Australia	**10.3**	**8.6–12.2**	**12.0**	**11.5–12.5**

Note: 'Age-standardised (AS) rate' is the number of interval cancers detected per 10,000 women-years, age-standardised to the population of women attending a BreastScreen Australia service in 2008; '95% CI' are 95% confidence intervals.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.31: Interval cancers for women screened in index years 2013, 2014 and 2015, by age group, all screening rounds, 0–12 months and 13–24 months follow-up

	Time since screen			
	0–12 months		13–24 months	
Age group (years)	**Number**	**Crude rate**	**Number**	**Crude rate**
40–49	300	7.9	418	12.0
50–59	716	6.0	1,196	11.0
60–69	666	6.2	1,264	12.6
70+	252	6.8	468	14.0

Note: 'Crude rate' is the number of interval cancers detected per 10,000 women-years.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.32: Interval cancer rate for women aged 50–69 screened in index years 2013, 2014 and 2015, by state and territory and screening round, 0–24 months follow-up

	First screening round		Subsequent screening rounds		All screening rounds	
State and territory	**AS rate**	**95% CI**	**AS rate**	**95% CI**	**AS rate**	**95% CI**
NSW	7.8	6.0–9.8	8.6	8.1–9.2	8.5	8.0–9.0
Vic	8.5	6.3–11.1	9.2	8.6–9.8	9.0	8.5–9.6
Qld	7.2	5.2–9.7	8.6	8.0–9.2	8.5	7.9–9.1
WA	8.8	5.3–13.1	9.5	8.5–10.5	9.4	8.5–10.3
SA	8.2	4.1–13.8	9.4	8.3–10.5	9.2	8.2–10.2
Tas	8.8	3.4–18.1	8.2	6.6–10.1	8.3	6.7–10.1
ACT	11.0	3.0–24.2	11.3	8.6–14.5	10.6	8.3–13.4
NT	3.0	0.4–10.8	6.7	3.3–12.0	6.3	3.4–10.9
Australia	**7.9**	**6.9–9.1**	**8.9**	**8.6–9.2**	**8.8**	**8.5–9.1**

Note: 'Age-standardised (AS) rate' is the number of interval cancers detected per 10,000 women-years, age-standardised to the population of women attending a BreastScreen Australia service in 2008; '95% CI' are 95% confidence intervals.

Source: AIHW analysis of BreastScreen Australia data.

A6b Program sensitivity

Table A3.33: Program sensitivity for women aged 50–69 screened in index years 2013, 2014 and 2015, by state and territory, first and subsequent screening rounds, 0–12 months follow-up

	First screening round	Subsequent screening rounds
State and territory	**AS rate**	**AS rate**
NSW	92.9	88.1
Vic	94.7	88.4
Qld	95.0	89.6
WA	94.6	88.1
SA	96.6	87.8
Tas	96.4	86.0
ACT	89.2	83.7
NT	97.1	93.3
Australia	**94.2**	**88.4**

Note: 'Age-standardised (AS) rate' is the number of screen-detected cancers as a percentage of all cancers (screen-detected and interval cancers), age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.34: Program sensitivity for women aged 50–69 screened in index years 2013, 2014 and 2015, by state and territory, first and subsequent screening rounds, 0–24 months follow-up

	First screening round	Subsequent screening rounds
State and territory	**AS rate**	**AS rate**
NSW	86.6	73.7
Vic	84.1	72.3
Qld	88.1	75.1
WA	83.9	72.7
SA	84.6	72.7
Tas	86.9	72.8
ACT	77.1	68.7
NT	94.4	79.8
Australia	**85.9**	**73.5**

Note: 'Age-standardised (AS) rate' is the number of screen-detected cancers as a percentage of all cancers (screen-detected and interval cancers), age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A3.35: Program sensitivity for women screened in index years 2013, 2014 and 2015, all screening rounds, by age group, 0–12 months and 0–24 months follow-up

	Time since screen	
	0–12 months	0–24 months
Age group (years)	**Crude rate**	**Crude rate**
40–49	81.1	64.3
50–59	88.1	73.4
60–69	91.4	78.5
70+	93.6	83.6

Note: 'Crude rate' is the number of screen detected cancers as a percentage of all cancers (screen detected and interval cancers).

Source: AIHW analysis of BreastScreen Australia data.

Table A3.36: Program sensitivity for women aged 50–69 screened in index years 2013, 2014 and 2015, all screening rounds, by state and territory, 0–12 months and 0–24 months follow-up

	Time since screen	
	0–12 months	0–24 months
State and territory	**AS rate**	**AS rate**
NSW	89.3	76.3
Vic	89.6	74.6
Qld	90.3	76.8
WA	89.2	75.0
SA	89.0	74.6
Tas	88.0	75.2
ACT	86.8	72.1
NT	94.0	84.8
Australia	**89.5**	**75.7**

Note: 'Age-standardised (AS) rate' is the number of screen detected cancers as a percentage of all cancers (screen detected and interval cancers), age-standardised to the population of women attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

A7a Invasive breast cancer incidence

Table A3.37: Incidence of invasive breast cancer, 1982 to 2016 (with estimates to 2020)

	New cases		AS rate	
Year of diagnosis	**50–74**	**All ages**	**50–74**	**All ages**
1982	2,976	5,313	182.1	81.1
1983	2,933	5,376	178.3	80.8
1984	3,185	5,713	190.8	83.6
1985	3,211	5,921	189.2	84.4
1986	3,323	6,086	195.2	85.1
1987	3,525	6,706	203.2	91.4
1988	3,580	6,735	204.0	89.7
1989	3,841	7,181	217.2	93.6
1990	3,918	7,436	219.8	95.1
1991	4,303	8,042	237.9	100.4
1992	4,182	8,022	228.8	98.2
1993	4,779	8,791	257.9	105.5
1994	5,494	9,756	289.5	114.6
1995	5,596	10,088	292.2	116.5
1996	5,368	9,749	274.9	109.8
1997	5,710	10,214	284.5	112.3
1998	6,079	10,761	295.5	115.5
1999	6,123	10,689	290.6	112.2
2000	6,569	11,421	303.7	117.1
2001	6,916	11,852	311.5	118.6
2002	7,030	12,109	308.6	118.5
2003	6,742	11,886	288.4	113.7
2004	7,075	12,229	295.8	114.7
2005	6,964	12,303	283.7	113.1
2006	7,412	12,739	293.8	114.6
2007	7,328	12,684	282.0	111.3
2008	8,018	13,694	299.7	117.7
2009	8,157	13,824	295.6	115.9
2010	8,650	14,412	304.5	118.2
2011	8,652	14,580	296.0	117.0
2012	9,153	15,358	304.4	120.8
2013	9,820	16,449	318.2	127.0
2014	10,430	16,972	329.6	128.0
2015	10,529	16,982	324.1	125.5
2016	10,756	17,354	324.5	125.8
2017	11,228	18,224	331.0	129.3
2018	11,551	18,750	333.1	130.3
2019	11,857	19,279	335.1	131.4
2020	12,165	19,807	337.2	132.5

Notes

1. ‘Age-standardised (AS) rate’ is the number of new cases of breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001.
2. Estimated incidence data for 2017–2020 are based on 2007–2016 incidence data (including the Northern Territory estimates for 2016). Actual incidence data for 2017–2020 may differ from estimated data due to current and ongoing program or practice changes.

Source: AIHW Australian Cancer Database 2016.

Table A3.38: Incidence of invasive breast cancer, by age group, 2016

Age group (years)	New cases	Crude rate
40–44	1,076	131.4
45–49	1,668	203.6
50–54	2,050	261.0
55–59	2,100	279.2
60–64	2,296	344.0
65–69	2,370	392.5
70–74	1,939	427.8
75–79	1,214	353.8
80–84	871	344.9
85+	911	300.2

Notes

1. 'Crude rate' is the number of new cases of breast cancer per 100,000 women.
2. Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016.

Table A3.39: Incidence of invasive breast cancer, by age group and histology group, 2016

Type of breast cancer	40–49	50–59	60–69	70+
Invasive ductal carcinoma	2,290	3,356	3,578	3,507
Invasive lobular carcinoma	267	495	665	698
Medullar carcinoma and atypical medullary carcinoma	17	11	8	6
Tubular carcinoma and invasive cribriform carcinoma	37	70	82	62
Mucinous carcinoma	37	60	83	186
Invasive papillary carcinoma	27	62	115	145
Inflammatory carcinoma	8	7	4	5
Mesenchymal	1	1	4	5
Other–specified	39	40	79	111
Unspecified	20	47	48	209

Note: Data for 2016 are estimated for the Northern Territory.

Source: AIHW Australian Cancer Database 2016.

Table A3.40: Incidence of invasive breast cancer in women aged 50–74, by state and territory, 2011–2015

State and territory	New cases	AS rate
NSW	15,876	315.7
Vic	11,975	313.1
Qld	9,723	318.6
WA	4,786	310.1
SA	3,907	319.3
Tas	1,256	312.0
ACT	767	332.0
NT	292	266.4
Australia	**48,584**	**315.1**

Note: 'Age-standardised (AS) rate' is the number of new cases of breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

Table A3.41: Incidence of invasive breast cancer in women aged 50–74, by remoteness area, 2011–2015

Remoteness area	New cases	AS rate
Major cities	32,812	316.9
Inner regional	10,313	313.3
Outer regional	4,697	311.0
Remote	526	284.1
Very remote	207	230.4
Australia	**48,584**	**315.1**

Notes

1. Remoteness was classified according to the Australian Statistical Geography Standard (ASGS).
2. 'Australia' does not match the total, because some women were not allocated to a remoteness area.
3. 'Age-standardised (AS) rate' is the number of new cases of breast cancers per 100,000 women age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

Table A3.42: Incidence of invasive breast cancer in women aged 50–74, by socioeconomic area, 2011–2015

Socioeconomic area	New cases	AS rate
1 (lowest)	9,297	296.3
2	9,799	304.1
3	9,692	310.5
4	9,317	319.9
5 (highest)	10,437	343.5
Australia	**48,584**	**315.1**

Notes

1. Socioeconomic area was allocated using the ABS Index of Relative Socio-economic Disadvantage (IRSD).
2. 'Australia' does not match the total because some women were not allocated to a socioeconomic area.
3. 'Age-standardised (AS) rate' is the number of new cases of breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

Table A3.43: Incidence of invasive breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status, 2011–2015

Indigenous status	New cases	Crude rate	AS rate
Indigenous[(a)]	501	233.1	250.5
Non-Indigenous[(a)]	28,826	305.8	302.6
Total[(a)]	**30,677**	**318.2**	**315.1**

(a) Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Notes

1. Some states and territories use an imputation method for determining Indigenous cancers, which may lead to differences between these data and those shown in jurisdictional cancer incidence reports.
2. 'Crude rate' is the number of new cases of breast cancer per 100,000 women; 'age-standardised (AS) rates' are the number of breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

Table A3.44: Number of new cases of invasive breast cancer in women (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status and age, 2011–2015

Age group (years)	Indigenous[(a)]	Non-Indigenous[(a)]	Total[(a)]
<20	. .	5	5
20–24	1	20	22
25–29	6	228	252
30–34	15	640	690
35–39	35	1,458	1,550
40–44	71	3,270	3,472
45–49	106	4,871	5,184
50–54	126	5,913	6,307
55–59	103	5,582	5,930
60–64	110	6,375	6,784
65–69	107	6,256	6,677
70–74	55	4,700	4,979
75+	75	8,187	8,812
All ages	810	47,505	50,664
50–74 years	**501**	**28,826**	**30,677**

(a) Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Note: Some states and territories use an imputation method for determining Indigenous cancers, which may lead to differences between these data and those shown in jurisdictional cancer incidence reports.

Source: AIHW Australian Cancer Database 2016.

Table A3.45: Incidence of invasive breast cancer in women (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status and age group, 2011–2015

Age group	Indigenous[(a)]	Non-Indigenous[(a)]	Total[(a)]
<20	. .	0.2	0.2
20–24	0.7	0.8	0.9
25–29	5.2	8.7	9.3
30–34	15.5	25.3	26.3
35–39	37.6	60.3	61.7
40–44	71.3	128.6	131.4
45–49	121.5	203.4	208.9
50–54	169.5	245.9	254.5
55–59	181.7	256.3	265.4
60–64	267.6	327.3	341.1
65–69	403.6	377.1	396.2
70–74	338.5	379.9	397.3
75+	370.3	317.3	338.9
All ages			
Crude rate	51.9	134.1	137.0
AS rate	97.1	118.9	123.8
50–74 years			
Crude rate	233.1	305.8	318.2
AS rate	250.5	302.6	315.1

(a) Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Notes

1. Some states and territories use an imputation method for determining Indigenous cancers, which may lead to differences between these data and those shown in jurisdictional cancer incidence reports.
2. ‘Crude rate’ is the number of new cases of breast cancer per 100,000 women; ‘age-standardised (AS) rates’ are the number of breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

Table A3.46: Number of new cases of invasive breast cancer in women (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status and state and territory, 2011–2015

	NSW	Qld	WA	NT	Total
Indigenous[(a)]					
All ages	338	267	121	84	810
50–74 years	218	164	71	48	501
Non-Indigenous[(a)]					
All ages	23,701	15,543	7,867	394	47,505
50–74 years	14,379	9,510	4,696	241	28,826

(a) Data are only presented for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been presented because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not presented for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Note: Some states and territories use an imputation method for determining Indigenous cancers, which may lead to differences between these data and those shown in jurisdictional cancer incidence reports.

Source: AIHW Australian Cancer Database 2016.

Table A3.47: Incidence of invasive breast cancer in women (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status and state and territory, 2011–2015

	NSW	Qld	WA	NT	Total
Indigenous[(a)]					
All ages					
Crude rate	54.3	50.9	50.7	47.9	51.9
AS rate	97.6	99.0	97.5	89.0	97.1
50–74 years					
Crude rate	242.9	237.6	221.1	200.1	233.1
AS rate	257.6	253.8	247.2	218.9	250.5
Non-Indigenous[(a)]					
All ages					
Crude rate	131.4	139.8	133.8	99.9	134.1
AS rate	113.8	125.5	123.7	116.5	118.9
50–74 years					
Crude rate	294.8	322.0	311.9	266.4	305.8
AS rate	291.1	318.6	310.5	276.1	302.6

(a) Data are only presented for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been presented because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not presented for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Notes

1. Some states and territories use an imputation method for determining Indigenous cancers, which may lead to differences between these data and those shown in jurisdictional cancer incidence reports.
2. ‘Crude rate’ is the number of new cases of breast cancer per 100,000 women; ‘age-standardised (AS) rates’ are the number of breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

Table A3.48: Number of new cases of invasive breast cancer in women (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status and remoteness area, 2011–2015

	Major cities	Inner regional	Outer regional	Remote	Very remote	Total
Indigenous[(a)]						
All ages	293	159	173	82	103	810
50–74 years	183	97	115	49	57	501
Non-Indigenous[(a)]						
All ages	32,862	9,325	4,483	564	193	47,505
50–74 years	19,585	5,877	2,862	358	118	28,826

(a) Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Note: Remoteness was classified according to the Australian Statistical Geography Standard (ASGS).

Source: AIHW Australian Cancer Database 2016.

Table A3.49: Incidence of invasive breast cancer in women (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status and remoteness area, 2011–2015

	Major cities	Inner regional	Outer regional	Remote	Very remote	Total
Indigenous[(a)]						
All ages						
Crude rate	51.6	45.9	55.3	68.0	48.7	51.9
AS rate	105.5	82.4	96.2	103.6	97.9	97.1
50–74 years						
Crude rate	255.6	201.0	247.6	246.1	202.1	233.1
AS rate	278.7	217.3	261.7	254.3	220.1	250.5
Non-Indigenous[(a)]						
All ages						
Crude rate	129.1	152.0	140.9	119.9	96.8	134.1
AS rate	119.1	118.1	118.2	120.5	98.4	118.9
50–74 years						
Crude rate	305.8	307.5	304.3	307.0	225.6	305.8
AS rate	303.4	299.9	302.4	312.4	231.3	302.6

(a) Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Notes:

1. Remoteness was classified according to the Australian Statistical Geography Standard (ASGS).
2. ‘Crude rate’ is the number of new cases of breast cancer per 100,000 women; ‘age-standardised (AS) rates’ are the number of breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

Table A3.50: Incidence of invasive breast cancer in women (New South Wales, Queensland, Western Australia and the Northern Territory), by Indigenous status, 2001–2005 to 2011–2015

	Indigenous[(a)]		Non-Indigenous[(a)]	
Years	**Crude rate**	**AS rate**	**Crude rate**	**AS rate**
All ages				
2001–2005	39.3	85.2	116.9	110.3
2006–2010	42.7	88.0	125.2	114.0
2011–2015	51.9	97.1	134.1	118.9
50–74 years				
2001–2005	216.8	226.8	282.2	281.6
2006–2010	214.5	227.3	293.9	291.6
2011–2015	233.1	250.5	305.8	302.6

(a) Data are only included for New South Wales, Queensland, Western Australia and the Northern Territory. Victorian data have not been included because of discrepancies in cancer incidence rates compared to these four jurisdictions. This may reflect differences in the number of data sources used to determine Indigenous status. Work is planned on validation of Indigenous status in Victorian cancer data. Data are not included for South Australia, Tasmania or the Australian Capital Territory because the Indigenous status variable is not of sufficient quality in these jurisdictions.

Note: 'Crude rate' is the number of new cases of breast cancer per 100,000 women; 'age-standardised (AS) rates' are the number of breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW Australian Cancer Database 2016.

A7b Ductal carcinoma in situ incidence

Table A3.51: Incidence of DCIS, 1996 to 2016

	New cases of DCIS		AS rate	
Year of diagnosis	**50–74**	**All ages**	**50–74**	**All ages**
1996	586	898	30.3	10.3
1997	664	1,020	33.4	11.5
1998	771	1,146	37.6	12.5
1999	784	1,148	37.5	12.3
2000	880	1,280	40.9	13.4
2001	995	1,408	44.9	14.4
2002	923	1,339	40.6	13.4
2003	977	1,400	41.8	13.6
2004	1,039	1,497	43.5	14.3
2005	1,048	1,498	42.6	14.0
2006	1,029	1,457	40.8	13.3
2007	1,074	1,550	41.3	13.8
2008	1,198	1,651	44.6	14.3
2009	1,237	1,735	44.9	14.8
2010	1,295	1,783	45.5	14.8
2011	1,323	1,831	45.1	14.8
2012	1,392	1,884	46.2	14.9
2013	1,569	2,148	50.8	16.7
2014	1,753	2,355	55.3	17.9
2015	1,710	2,286	52.6	17.0
2016	1,673	2,261	50.6	16.5

Notes

1. New South Wales has been collecting DCIS incidence data from early 2000, with its collection considered complete from 2002. New South Wales does not report in situ data, which means that it is unable to validate the data in this report.
2. ‘Age-standardised (AS) rate’ is the number of new cases of DCIS per 100,000 women, age-standardised to the Australian population at 30 June 2001.
3. The counting rules for DCIS incidence were revised for the 2016 ACD. For this reason, comparisons should not be made with DCIS data from previous versions of the ACD. See Box 3.7 for more details.

Source: AIHW Australian Cancer Database 2016.

Table A3.52: Incidence of DCIS, by age group, 2016

Age group (years)	New cases of DCIS	Crude rate
40–49	343	20.9
50–59	677	44.0
60–69	737	58.0
70+	442	32.7

Notes

1. New South Wales does not report in situ data, which means that it is unable to validate the data in this report.
2. ‘Crude rate’ is the number of new cases of DCIS per 100,000 women.
3. The counting rules for DCIS incidence were revised for the 2016 ACD. For this reason, comparisons should not be made with DCIS data from previous versions of the ACD. See Box 3.7 for more details.

Source: AIHW Australian Cancer Database 2016.

A8 Mortality from breast cancer

Table A3.53: Mortality from breast cancer, 1982 to 2018 (with estimates to 2020)

	Number of deaths		AS rate	
Year of death	**50–74**	**All ages**	**50–74**	**All ages**
1982	1,160	1,987	71.2	30.4
1983	1,250	2,040	75.1	30.2
1984	1,255	2,166	75.0	31.6
1985	1,238	2,196	72.6	31.2
1986	1,224	2,165	70.8	29.9
1987	1,274	2,293	73.6	31.1
1988	1,302	2,361	73.5	31.2
1989	1,307	2,449	73.0	31.6
1990	1,320	2,422	72.8	30.6
1991	1,357	2,526	74.1	31.3
1992	1,240	2,429	66.7	29.4
1993	1,357	2,611	72.0	30.8
1994	1,372	2,669	71.5	30.9
1995	1,381	2,635	70.4	29.7
1996	1,335	2,620	67.1	28.8
1997	1,318	2,604	64.8	27.9
1998	1,260	2,541	60.7	26.5
1999	1,282	2,512	60.4	25.6
2000	1,247	2,521	57.3	24.9
2001	1,303	2,594	58.4	25.0
2002	1,349	2,681	59.2	25.2
2003	1,352	2,710	57.9	24.9
2004	1,347	2,665	56.3	24.0
2005	1,346	2,710	55.0	23.8
2006	1,311	2,624	52.3	22.4
2007	1,358	2,722	52.4	22.6
2008	1,347	2,746	50.4	22.3
2009	1,394	2,786	50.9	22.2
2010	1,372	2,837	48.4	21.7
2011	1,447	2,901	49.6	21.8
2012	1,438	2,824	48.0	20.8
2013	1,435	2,864	46.4	20.4
2014	1,407	2,836	44.3	19.8
2015	1,413	2,899	43.4	19.9
2016	1,449	2,986	43.0	19.9
2017	1,434	2,948	41.8	19.2
2018	1,423	2,999	40.4	19.1
2019	1,416	2,993	39.3	18.6
2020	1,403	2,997	38.2	18.2

Notes

1. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. ‘Age-standardised (AS) rate’ is the number of deaths from breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001.
3. Estimated mortality data for 2019–2020 are based on 2009–2018 mortality data.

Source: AIHW National Mortality Database.

Table A3.54: Mortality from breast cancer, by age group, 2018

Age group (years)	Number of deaths	Crude rate
40–44	81	10.1
45–49	153	17.9
50–54	187	24.0
55–59	283	36.3
60–64	293	42.0
65–69	313	50.7
70–74	347	67.0
75–79	337	92.0
80–84	308	115.2
85+	623	199.4

Notes

1. Deaths in 2018 were derived by year of registration of death; these are based on the preliminary version of cause of death data and are subject to further revision by the ABS.
2. ‘Crude rate’ is the number of deaths from breast cancer per 100,000 women.

Source: AIHW National Mortality Database.

Table A3.55: Mortality from breast cancer in women aged 50–74, by state and territory, 2014–2018

State and territory	Number of deaths	AS rate
NSW	2,304	42.4
Vic	1,834	43.9
Qld	1,397	41.7
WA	678	40.6
SA	568	43.3
Tas	202	46.6
ACT	88	35.1
NT	54	46.8
Australia	**7,126**	**42.6**

Notes

1. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. ‘Age-standardised (AS) rate’ is the number of deaths from breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW National Mortality Database.

Table A3.56: Mortality from breast cancer in women aged 50–74, by remoteness area, 2014–2018

Remoteness area	Number of deaths	AS rate
Major cities	4,637	41.4
Inner regional	1,689	46.6
Outer regional	684	41.8
Remote	68	34.8
Very remote	30	32.5
Australia	**7,126**	**42.6**

Notes

1. Remoteness classification according to the ASGS remoteness Areas.
2. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
3. 'Age-standardised (AS) rate' is the number of deaths from breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW National Mortality Database.

Table A3.57: Mortality from breast cancer in women aged 50–74, by socioeconomic area, 2014–2018

Socioeconomic area	Number of deaths	AS rate
1 (lowest)	1,517	45.0
2	1,569	44.6
3	1,469	43.1
4	1,309	41.2
5 (highest)	1,244	38.1
Australia	**7,126**	**42.6**

Notes

1. Socioeconomic areas were classified according to the ABS IRSD.
2. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
3. 'Age-standardised (AS) rate' is the number of deaths from breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW National Mortality Database.

Table A3.58: Mortality from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2014–2018

Indigenous status	Number of deaths	Crude rate	AS rate
Indigenous(a)	116	43.8	47.4
Non-Indigenous(a)	4,861	43.0	41.8
Total(a)(b)	**5,001**	**43.3**	**42.1**

(a) Indigenous, Non-Indigenous and Total are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only. Data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

(b) Total includes women whose Indigenous status is not stated.

Notes

1. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. 'Crude rate' is the number of deaths from breast cancer per 100,000 women; 'age-standardised (AS) rates' are the number of deaths from breast cancers per 100,000 women, age-standardised to the Australian population at 30 June 2001.

Source: AIHW National Mortality Database.

Table A3.59: Number of deaths from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status and age group, 2014–2018

Age group	Indigenous[a]	Non-Indigenous[a]	Total[a][b]
<20	0	0	0
20–24	0	1	1
25–29	1	12	13
30–34	3	69	72
35–39	7	156	163
40–44	13	299	313
45–49	15	475	494
50–54	19	704	726
55–59	31	901	937
60–64	26	977	1,007
65–69	22	1,163	1,188
70–74	18	1,116	1,143
75+	34	4,200	4,252
All ages	189	10,073	10,309
50–74 years	**116**	**4,861**	**5,001**

(a) Indigenous, Non-Indigenous and Total are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only. Data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

(b) Total includes women whose Indigenous status is not stated.

Note: Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

Source: AIHW National Mortality Database.

Table A3.60: Mortality from breast cancer in women (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status and age group, 2014–2018

Age group	Indigenous[(a)]	Non-Indigenous[(a)]	Total[(a)(b)]
<20	0.0	0.0	0.0
20–24	0.0	0.0	0.0
25–29	0.7	0.4	0.4
30–34	2.6	2.3	2.3
35–39	7.1	5.7	5.7
40–44	12.7	10.7	10.8
45–49	14.9	17.1	17.1
50–54	22.0	26.1	26.1
55–59	44.2	34.7	35.2
60–64	50.3	42.1	42.5
65–69	62.3	56.2	56.5
70–74	84.4	69.2	69.9
75+	136.6	133.8	134.4
All ages			
Crude rate	10.7	24.4	24.0
AS rate	21.5	19.9	20.0
50–74 years			
Crude rate	43.8	43.0	43.3
AS rate	47.4	41.8	42.1

(a) Indigenous, Non-Indigenous and Total are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only. Data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

(b) Total includes women whose Indigenous status is not stated.

Notes

1. 'Crude rate' is the number of deaths from breast cancer per 100,000 women.
2. 'Age-standardised (AS) rate' is the number of deaths from breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001. Rates based on less than 20 deaths should be interpreted with caution.
3. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
4. Rates were calculated using the Aboriginal and Torrres Strait Islander backcast and projected population estimates derived from the 2016 Census (ABS 2019, ABS cat. no. 3238.0). Non-Indigenous population estimates were derived by subtracting the Aboriginal and Torres Strait Islander population estimates from the Australian Estimated Resident Population (ABS 2019, ABS cat. no. 3101.0).

Source: AIHW National Mortality Database.

Table A3.61: Number of deaths from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status and state and territory, 2014–2018

	NSW	Qld	WA	SA	NT	Total[(a)]
Indigenous[(a)]						
All ages	70	52	29	11	27	189
50–74 years	47	34	15	7	13	116
Non-Indigenous[(a)]						
All ages	4,776	2,690	1,307	1,244	56	10,073
50–74 years	2,244	1,354	661	561	41	4,861

(a) Indigenous, Non-Indigenous and Total are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only. Data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

Note: Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

Source: AIHW National Mortality Database.

Table A3.62: Mortality from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status and state and territory, 2014–2018

	NSW	Qld	WA	SA	NT	Total[(a)]
Indigenous[(a)]						
All ages						
Crude rate	10.6	9.3	11.5	10.3	14.7	10.7
AS rate	19.3	18.4	24.5	21.4	35.5	21.5
50–74 years						
Crude rate	45.3	42.7	40.0	44.6	46.1	43.8
AS rate	47.3	46.8	43.9	61.5	46.2	47.4
Non-Indigenous[(a)]						
All ages						
Crude rate	25.3	23.0	21.4	29.5	13.8	24.4
AS rate	20.1	19.6	18.8	21.4	17.0	19.9
50–74 years						
Crude rate	43.5	42.5	41.2	45.0	43.2	43.0
AS rate	42.0	41.4	40.4	43.3	46.6	41.8

(a) Indigenous, Non-Indigenous and Total are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only. Data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

Notes

1. 'Crude rate' is the number of deaths from breast cancer per 100,000 women.
2. 'Age-standardised (AS) rate' is the number of deaths from breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001. Rates based on less than 20 deaths should be interpreted with caution.
3. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
4. Rates were calculated using the Aboriginal and Torres Strait Islander backcast and projected population estimates derived from the 2016 Census (ABS 2019, ABS cat. no. 3238.0). Non-Indigenous population estimates were derived by subtracting the Aboriginal and Torres Strait Islander population estimates from the Australian Estimated Resident Population (ABS 2019, ABS cat. no. 3101.0).

Source: AIHW National Mortality Database.

Table A3.63: Number of deaths from breast cancer in women aged 50–74, by Indigenous status and remoteness area, 2014–2018[(a)]

	Major cities	Inner regional and Outer regional	Remote and Very remote	Total[(b)]
Indigenous				
All ages	69	92	45	206
50–74 years	39	61	25	125
Non-Indigenous				
All ages	9,690	4,545	144	14,400
50–74 years	4,611	2,270	72	6,969

(a) Indigenous, Non-Indigenous and Total were calculated from all states and territories combined.

(b) Total includes missing remoteness area.

Note: Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

Source: AIHW National Mortality Database.

Table A3.64: Mortality from breast cancer in women aged 50–74, by Indigenous status and remoteness area, 2014–2018[(a)]

	Major cities	Inner regional and Outer regional	Remote and Very remote	Total[(b)]
Indigenous				
All ages				
Crude rate	9.1	10.5	12.0	10.3
AS rate	18.3	19.6	26.9	20.5
50–74 years				
Crude rate	36.8	44.7	41.1	41.5
AS rate	39.2	49.1	43.5	45.1
Non-Indigenous				
All ages				
Crude rate	22.5	30.0	18.0	24.4
AS rate	19.5	21.2	17.1	20.0
50–74 years				
Crude rate	42.2	46.8	31.8	43.5
AS rate	41.3	44.6	32.0	42.3

(a) Indigenous, Non-Indigenous and Total were calculated from all states and territories combined.

(b) Total includes women whose Indigenous status is not stated.

Notes

1. ‘Crude rate’ is the number of deaths from breast cancer per 100,000 women.
2. ‘Age-standardised (AS) rate’ is the number of deaths from breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001. Rates based on less than 20 deaths should be interpreted with caution.
3. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
4. Rates were calculated using the Aboriginal and Torres Strait Islander backcast and projected population estimates derived from the 2016 Census (ABS 2019, ABS cat. no. 3238.0). Non-Indigenous population estimates were derived by subtracting the Aboriginal and Torres Strait Islander population estimates from the Australian Estimated Resident Population by region (ABS 2019, ABS cat. no. 3235.0).

Source: AIHW National Mortality Database.

Table A3.65: Number of deaths from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2004–2008 to 2014–2018

Years	Indigenous[(a)]	Non-Indigenous[(a)]	Total[(a)(b)]
All ages			
2004–2008	125	9,274	9,461
2009–2013	144	9,736	9,968
2014–2018	189	10,073	10,309
50–74 years			
2004–2008	76	4,609	4,721
2009–2013	86	4,918	5,045
2014–2018	116	4,861	5,001

(a) Indigenous, Non-Indigenous and Total are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only. Data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

(b) Total includes women whose Indigenous status is not stated.

Note: Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

Source: AIHW National Mortality Database.

Table A3.66: Mortality from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2004–2008 to 2014–2018

	Indigenous[(a)]		Non-Indigenous[(a)]		Total[(a)(b)]	
Years	Crude rate	AS rate	Crude rate	AS rate	Crude rate	AS rate
All ages						
2004–2008	8.8	21.4	26.3	23.0	25.8	23.2
2009–2013	9.0	20.5	25.4	21.5	24.9	21.7
2014–2018	10.7	21.5	24.4	19.9	24.0	20.0
50–74 years						
2004–2008	49.2	53.1	52.5	52.3	52.8	52.7
2009–2013	42.0	46.2	48.7	48.3	49.0	48.6
2014–2018	43.8	47.4	43.0	41.8	43.3	42.1

(a) Indigenous, Non-Indigenous and Total are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only. Data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

(b) Total includes women whose Indigenous status is not stated.

Notes

1. ‘Crude rate’ is the number of deaths from breast cancer per 100,000 women.
2. ‘Age-standardised (AS) rate’ are the number of deaths from breast cancer per 100,000 women, age-standardised to the Australian population at 30 June 2001. Rates based on less than 20 deaths should be interpreted with caution.
3. Deaths from 2014 to 2017 were derived by year of death; deaths in 2018 were derived by year of registration of death. Deaths registered in 2015 and earlier are based on the final version of cause-of-death data; deaths registered in 2016 are based on revised versions; and deaths registered in 2017 and 2018 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
4. Rates were calculated using the Aboriginal and Torrres Strait Islander backcast and projected population estimates derived from the 2016 Census (ABS 2019, ABS cat. no. 3238.0). Non-Indigenous population estimates were derived by subtracting the Aboriginal and Torres Strait Islander population estimates from the Australian Estimated Resident Population (ABS 2019, ABS cat. no. 3101.0).

Source: AIHW National Mortality Database.

Appendix B: BreastScreen Australia information

Australia's national breast cancer screening program was established in 1991 as the National Program for the Early Detection of Breast Cancer. This program is now known as BreastScreen Australia, and is a joint program of the Australian and state and territory governments. BreastScreen Australia aims to reduce mortality and morbidity from breast cancer.

BreastScreen Australia provides free biennial breast cancer screening to women through dedicated screening and assessment services. Women have a screening mammogram performed at a screening unit (which may be fixed, relocatable or mobile). Women whose images are suspicious for breast cancer are recalled for further investigation by a multidisciplinary team at an assessment centre. Further investigation may include clinical examination, mammography, ultrasound and biopsy procedures. Most women who are recalled for assessment are found not to have breast cancer.

Box B1: Objectives of BreastScreen Australia

The objectives of the BreastScreen Australia Program are to:

1. Reduce the mortality and morbidity attributable to breast cancer.
2. Maximise early detection of breast cancer in the target population.
3. Maximise the proportion of women in the target population who are screened every two years.
4. Provide high-quality services that are equitable, acceptable and appropriate to the needs of the population and equally accessible to all women in the target age group.
5. Provide screening and assessment services in accredited Screening and Assessment Services as part of the BreastScreen Australia program.
6. Provide high standards of program management, service delivery, monitoring, evaluation and accountability.

Source: BreastScreen Australia 2018.

Box B2: All BreastScreen services now use digital mammography

Digital mammography is a technique for recording breast X-ray images in computer code instead of on X-ray film (as with conventional film mammography). Digital mammography is as accurate as film mammography in screening asymptomatic women for breast cancer.

Advantages of digital mammography include increased efficiencies, improved working environment for radiographers, less physical storage requirements, and reduced need for radiologists to be on site to read mammograms.

In 2009, it was announced that $120 million would be provided over 4 years to ensure BreastScreen Australia would be fully digital by June 2013.

All BreastScreen services now use digital mammography.

Box B3: National policy features of BreastScreen Australia

Services accredited under BreastScreen Australia are expected to operate according to the National Accreditation Standards (NAS) of BreastScreen Australia, along with the national policy features and protocols detailed in this box.

1: Access and participation

Appropriate levels of access and participation in the target and eligible populations:

a. Women are selected for screening on the basis of age alone. (That is, women 40 years of age and above are eligible to participate and recruitment strategies are targeted at women aged 50–74).

b. The screening interval is every two years.

c. Screening is provided at minimal or no cost to the women, and free of charge to eligible women who would not attend if there were a charge.

d. Patterns of participation are representative of the socioeconomic, ethnic and cultural profiles of the target population.

2: Cancer detection

Breast cancer detection is maximised in the target population and harm is minimised:

a. Screening employs mammography as the primary screening method.

b. All women are screened with two view mammography. Reasons for any variation from this policy are documented.

c. All mammograms are taken by a mammographic technologist or radiographer appropriately trained in screening mammography.

d. All mammographic images are read and reported independently, in a blind relationship, by two or more readers, at least one of whom shall be a radiologist.

e. All mammography results are combined into a single recommendation, which indicates whether or not further assessment for the presence of breast cancer is required.

3: Assessment

Assessment and diagnosis of breast cancer is appropriate, safe and effective:

a. A comprehensive approach is employed in the assessment of breast abnormalities.

b. A multidisciplinary team is involved in the assessment of women recalled from screening.

c. The pre-operative diagnosis of breast cancer is maximised, and recommendations for surgery for benign lesions are minimised.

d. The outcomes for all women recommended for surgery are collected, reviewed and utilised in continuing professional education for members of the multidisciplinary team.

e. Women's general practitioners are kept informed of the results of screening and assessment, unless a woman directs otherwise.

(continued)

Box B3 (continued): National policy features of BreastScreen Australia

4: Timeliness

Screening and assessment services are provided to women in a timely and efficient manner:

a. Women have timely access to screening.

b. The time from screening to assessment is minimised.

c. The results of screening and assessment are provided promptly and directly to the woman concerned in ways which are sensitive to her possible anxiety.

5: Data management and information systems

Effective data and information management systems:

a. Data are collected, stored and managed using secure, quality, contemporary data management and communication systems that comply with relevant state and national standards, and that enable valid, reliable system and service performance analysis and evaluation.

b. Data are used for strategic purposes, quality improvement of services and for clinical and service management.

c. Data are collected in line with the requirements of the BreastScreen Australia Data Dictionary.

d. Data are to be submitted annually to the Australian Institute of Health and Welfare, for use in a national program monitoring report, and annual performance data reports for review by the National Quality Management Committee.

6: Client focus

Services are of high quality and client focused:

a. High quality information is provided to inform women, and women feel appropriately engaged and supported.

b. Screening services are provided in a manner which is acceptable to women in accessible, non-threatening and comfortable environments.

c. Women and health-care providers are given comprehensive and easily understood information about the Program, from screening up to and including diagnosis of breast cancer.

d. Counselling and information are an integral part of the Program.

e. Women are advised of the benefits and risks of mammography.

f. Women are provided with written information and actively involved in decisions about their management, particularly in relation to further assessment and treatment.

7: Governance and management

Effective structures and processes are in place to ensure high-quality governance and management:

a. Screening and assessment are carried out at BreastScreen Australia accredited services.

b. Key stakeholders and stakeholder groups participate in the monitoring and management of the Program.

Performance indicators

The performance of a population-based cancer screening program such as BreastScreen Australia needs to be assessed as it relates to the underlying aims of the program. At the national level, this is achieved by reporting data against a series of performance indicators to allow screening outcomes to be monitored, and positive and negative trends identified early.

BreastScreen Australia has been monitored since 1996–1997 using performance indicators developed and endorsed by the former National Screening Information Advisory Group and by jurisdictional BreastScreen programs. These national performance indicators represent key measures of the progress BreastScreen Australia is making towards reducing morbidity and mortality from breast cancer; they are listed in Table B1.

Table B1: Performance indicators for BreastScreen Australia

Performance indicators	
1 Participation	The percentage of women aged 50–74 who have a screening mammogram through BreastScreen Australia in a 2-year period
2 Rescreening	The proportion of women screened who return for a rescreen within 27 months
3 Recall to assessment	The proportion of women screened who are recalled for further investigation
4 Invasive breast cancer detection	The number of women with invasive breast cancer detected through BreastScreen Australia
5 Ductal carcinoma in situ detection	The number of women with DCIS detected through BreastScreen Australia
6 Sensitivity	The ability of screening mammography to successfully detect cancers
6a Interval cancers	
6b Program sensitivity	
7 Incidence	The number of new cases of invasive breast cancer or DCIS
7a Invasive breast cancer incidence	
7b Ductal carcinoma in situ incidence	
8 Mortality	The number of deaths from invasive breast cancer

Note: Further details and definitions of performance indicators are available in previous BreastScreen Australia monitoring reports and in the *BreastScreen Australia data dictionary: version 1.2* (AIHW 2019b).

Source: BreastScreen Australia data dictionary: version 1.2 (AIHW 2019b).

National Accreditation Standards (NAS) Measures

Provision of a high-quality service to women is of great importance to BreastScreen Australia. For this reason, services accredited under BreastScreen Australia are expected to operate according to the National Accreditation Standards (NAS) of BreastScreen Australia, along with national policy features and protocols. The accreditation system, of which the NAS are an integral part, intends to drive continuous quality improvement in the delivery of breast screening services to ensure women receive safe, effective and high-quality care.

The BreastScreen Australia NAS have been developed to ensure that all women receive breast screening services that are of a consistently high quality, regardless of where they attend for screening or assessment.

A number of NAS are consistent with the performance indicators in this report. For this reason, where appropriate, the data in this report are benchmarked against the NAS. These benchmarks are useful in helping to interpret the data presented, although in considering how these national data compare with the NAS, it should be noted that the NAS were not designed to be used as standards for the BreastScreen Australia performance indicators.

NAS Measures that relate to these data, along with data analysed by the Australian Institute of Health and Welfare (AIHW), appear in tables 3.1, 3.2, 3.3, 3.4, 3.5 and 3.8 in this report.

Contact details and online resources for BreastScreen Australia components are provided in Table B2.

Table B2: Contacts and links for the state, territory and Australian government components of BreastScreen Australia

BreastScreen New South Wales	
Tel: (02) 8374 5777 Fax: (02) 8374 5699 Email: information@cancerinstitute.org.au	www.bsnsw.org.au
BreastScreen Victoria	
Tel: (03) 9660 6888 Fax: (03) 9662 3881 Email: info@BreastScreen.org.au	www.BreastScreen.org.au
BreastScreen Queensland	
Tel: (07) 3328 9467 Fax: (07) 3328 9487 Email: cssb@health.gov.au	www.health.qld.gov.au/breastscreen
BreastScreen Western Australia	
Tel: (08) 9323 6700 Fax: (08) 9323 6799 Email: BreastScreenwa@health.wa.gov.au	www.BreastScreen.health.wa.gov.au
BreastScreen South Australia	
Tel: (08) 8274 7100 Fax: (08) 8373 4395 Email: HealthBSSAEnquiries@sa.gov.au	www.breastscreensa.sa.gov.au
BreastScreen Tasmania	
Tel: (03) 6216 4300 Fax: (03) 6216 4326 Email: canscreen@dhhs.tas.gov.au	http://www.dhhs.tas.gov.au/service_information/services_files/breastscreen_tasmania
BreastScreen ACT	
Tel: (02) 6205 4444 Fax: (02) 6205 1394 Email: BreastScreen@act.gov.au	https://www.health.act.gov.au/services-and-programs/women-youth-and-children/womens-health/breast-screening
BreastScreen NT	
Tel: (08) 8922 6449 Fax: (08) 8922 6440 Email: wcpp.ths@nt.gov.au	https://nt.gov.au/wellbeing/cancer-services/breastscreennt
Department of Health	
Email: cancerscreening@health.gov.au	http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/breast-screening-1
AIHW	
Email: screening@aihw.gov.au	https://www.aihw.gov.au/reports-data/health-welfare-services/cancer-screening/overview

Appendix C: Data sources

Data used in this report are derived from multiple sources and are summarised in Table C1.

Table C1: Data sources for *BreastScreen Australia monitoring report 2020*

Data used to monitor BreastScreen Australia	Data source
Monitoring BreastScreen Australia using BreastScreen data	
Performance Indicator 1 Participation	State and territory BreastScreen registers; ABS population data
Performance Indicator 2 Rescreening	State and territory BreastScreen registers
Performance Indicator 3 Recall to assessment	State and territory BreastScreen registers
Performance Indicator 4 Invasive breast cancer detection	State and territory BreastScreen registers
Performance Indicator 5 DCIS detection	State and territory BreastScreen registers
Performance Indicator 6 Sensitivity	State and territory BreastScreen registers
Monitoring BreastScreen Australia using AIHW data	
Performance Indicator 7 Incidence	AIHW Australian Cancer Database; ABS population data
Performance Indicator 8 Mortality	AIHW National Mortality Database; ABS population data
Monitoring other aspects of BreastScreen Australia	
Expenditure on BreastScreen Australia	AIHW Health expenditure database

State and territory BreastScreen registers

Data for the performance indicators *Participation, Rescreening, Recall to assessment, Invasive breast cancer detection, DCIS detection*, and *Sensitivity* are sourced from the BreastScreen register in each state and territory, according to definitions and data specifications in the *BreastScreen Australia data dictionary version 1.2* (AIHW 2019b). These data are compiled into national figures by the AIHW to allow national monitoring of BreastScreen Australia.

The Data Quality Statement for BreastScreen Australia data can be found on the AIHW website at https://meteor.aihw.gov.au/content/index.phtml/itemId/710033.

AIHW Australian Cancer Database

All forms of cancer, except basal and squamous cell carcinomas of the skin, are notifiable diseases in each Australian state and territory. Legislation in each jurisdiction requires hospitals, pathology laboratories and various other institutions to report all cases of cancer to their central cancer registry. An agreed subset of the data collected by these registries is supplied annually to the AIHW, where it is compiled into the Australian Cancer Database (ACD). The ACD currently contains data on all cases of cancer diagnosed from 1982 to 2015 for all states and territories; for 2016, it contains data for all jurisdictions except the Northern Territory.

Cancer reporting and registration is a dynamic process, and records in the state and territory cancer registries may be modified if new information is received. As a result, the number of cancer cases reported by the AIHW for any particular year may change slightly over time and may not always align with state and territory reporting for that same year.

The 2017–2020 estimates for incidence (plus 2016 estimates for the Northern Territory) used a method described in the technical notes of *Cancer data in Australia* (AIHW 2020).

The Data Quality Statement for the 2016 ACD can be found on the AIHW website at http://meteor.aihw.gov.au/content/index.phtml/itemId/729012.

National Death Index

The National Death Index is a database, housed at the AIHW, which 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 National Death Index is designed to facilitate the conduct of epidemiological studies and its use is strictly confined to medical research.

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

The Data Quality Statement for the National Death Index can be found at http://meteor.aihw.gov.au/content/index.phtml/itemId/480010.

National Mortality Database

The AIHW NMD contains information supplied by the registrars of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice)—and coded by the ABS—for deaths from 1964 to 2018. Registration of deaths is the responsibility of the Registry of Births, Deaths and Marriages in each state and territory. These data are then collated and coded by the ABS and maintained at the AIHW in the NMD.

In the NMD, both the year in which the death occurred and the year in which it was registered are provided. For the purposes of this report, actual mortality data are shown based on the year the death occurred, except for the most recent year (2018), where the number of people whose death was registered is used. Previous investigation has shown that the year of death and its registration coincide for the most part. However, in some instances, deaths at the end of each calendar year may not be registered until the following year. Thus, year of death information for the latest available year is generally an underestimate of the actual number of deaths that occurred in that year.

In this report, deaths registered in 2015 and earlier are based on the final version of cause of death data; deaths registered in 2016 are based on the revised version; and deaths registered in 2017 and 2018 are based on preliminary versions. Revised and preliminary versions are subject to further revision by the ABS.

The 2019–2020 estimates for mortality were based on the 2009–2018 NMD and used a method as described in the technical notes of *Cancer data in Australia* (AIHW 2020).

The data quality statements underpinning the AIHW NMD can be found on the following ABS internet pages:

- ABS quality declaration summary for Deaths, Australia (ABS cat. no. 3302.0) http://www.abs.gov.au/ausstats/abs%40.nsf/mf/3302.0/
- ABS quality declaration summary for Causes of death, Australia (ABS cat. no. 3303.0) http://www.abs.gov.au/ausstats/abs%40.nsf/mf/3303.0/.

For more information on the AIHW NMD, see the section 'Deaths data at AIHW' on the following web site: https://www.aihw.gov.au/about-our-data/our-data-collections/national-mortality-database/.

Aboriginal and Torres Strait Islander deaths

The ABS Death Registrations collection identifies a death as Aboriginal and Torres Strait Islander where the deceased is recorded as Aboriginal, Torres Strait islander, or both, on the Death Registration Form. Since 2007, the Indigenous status of the deceased has also been derived from the Medical Certificate of Cause of Death for South Australia, Western Australia, Tasmania, the Northern Territory and the Australian Capital Territory. For New South Wales and Victoria, the Indigenous status of the deceased is derived from the Death Registration Form only. If the Indigenous status reported in this form does not agree with that in the Medical Certificate of Cause of Death, an identification from either source that the deceased was an Aboriginal and/or Torres Strait Islander person is given preference over identifying them as non-Indigenous.

Australian Burden of Disease Study

The Australian Burden of Disease Study (ABDS) 2015 used burden of disease analysis to measure the impact of 216 diseases and injuries on the health of the Australian population. The study provides a detailed picture of the burden of disease in the population in 2003, 2011 and 2015. It includes estimates of total, fatal and non-fatal burden for the total Australian population, as well as by state and territory, remoteness areas and socioeconomic areas. It also includes estimates of the contribution made by selected risk factors on the disease burden in Australia, and by socioeconomic areas for some risk factors.

The ABDS 2015 uses and adapts the methods of global studies to produce estimates that are more relevant to the Australian health policy context. The chosen reference period (2015) reflects the data availability from key data sources (such as the National Health Survey, deaths data, hospital admissions data and various disease registers) at the time of analysis.

Results from the study provide an important resource for health policy formulation, health service planning, and population health monitoring. The results provide a foundation for further assessments; for example, in relation to health interventions that aim to prevent or treat diabetes and its complications, and disease expenditure.

Full details on the various methods, data sources and standard inputs used in the ABDS 2015 are available in *Australian Burden of Disease Study 2015: methods and supplementary material* (AIHW 2019c).

AIHW Health Expenditure Database

The AIHW Health Expenditure Database contains estimates of expenditure by disease category, age group and sex for each of the following areas of expenditure: admitted patient hospital services, out-of-hospital medical services, prescription pharmaceuticals, optometrical and dental services, community mental health services and public health cancer screening.

The Data Quality Statement for the Disease Expenditure Database 2017–18 can be found on the AIHW website at http://meteor.aihw.gov.au/content/index.phtml/itemId/721415.

Population data

Throughout this report, population data were used to derive rates of participation in breast cancer screening, breast cancer incidence and mortality rates. The population data were sourced from the ABS using the most up-to-date estimates available at the time of analysis.

To derive its estimates of the resident populations, the ABS uses the 5-yearly Census of Population and Housing data and adjusts them as follows:

- all respondents in the Census are placed in their state or territory, statistical 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 from the ABS website at http://www.abs.gov.au.

For the Indigenous incidence and mortality comparisons in this report, the most recently released ABS Indigenous estimated resident populations were used. Those estimates were based on the 2016 Census of Population and Housing (ABS 2018).

Appendix D: Classifications

Age

The data in this report are stratified by the age of the woman at the time of the specified test (for screening data), at the time of diagnosis (for cancer incidence data) or at the time of death (for cancer mortality data).

State or territory

The state or territory reported is the one where screening took place (for the screening data), where the diagnosis was made (for the cancer incidence data), or the place of usual residence (for the cancer mortality data).

Index of Relative Socio-economic Disadvantage

The Index of Relative Socio-economic Disadvantage (IRSD) is one of 4 Socio-Economic Indexes for Areas developed by the ABS. This index is based on factors such as average household income, education levels and unemployment rates. It is not a person-based measure, but an area-based measure of socioeconomic disadvantage in which small areas of Australia are classified on a continuum from disadvantaged to affluent. This information is used as a proxy for the socioeconomic disadvantage of people living in those areas and may not be correct for each person in that area.

In this report, the first socioeconomic area corresponds to geographical areas containing the 20% of the population with the greatest socioeconomic disadvantage according to the IRSD, and the fifth area corresponds to the 20% of the population with the least socioeconomic disadvantage. Caution should always be used when analysing the results of data that have been converted using correspondences, with the potential limitations of the data taken into account.

Socioeconomic areas for screening data

Participants' areas of residence were assigned to socioeconomic areas using the participant's residential postcode according to the IRSD for 2016. Socioeconomic groupings (based on IRSD rankings) were calculated with a postal area correspondence, using a population-based method at the Australia-wide level. Participants whose postcode was not available in the socioeconomic correspondence were included in an 'Unknown' column in the relevant tables.

Socioeconomic areas for incidence and mortality

Socioeconomic disadvantage areas were assigned to cancer cases according to the IRSD for 2011 of the Statistical Area Level 2 of residence at the time of diagnosis, and to deaths according to the Statistical Area Level 2 of residence at the time of death. The 2011 IRSD classifications were used for cancer cases as data were more complete using the 2011 Statistical Area Level 2, than the 2016 Statistical Area Level 2 within the 2016 ACD. For consistency between incidence and mortality reporting, 2011 classifications were also used for mortality reporting.

International Statistical Classification of Diseases and Related Health Problems

The International Statistical Classification of Diseases and Related Health Problems (ICD) is used to classify diseases and other health problems (including symptoms and injuries) in clinical and administrative records. The use of a standard classification system enables the storage and retrieval of diagnostic information for clinical and epidemiological purposes that is comparable between different service providers, across countries and over time.

In 1903, Australia adopted the ICD to classify causes of death and it was fully phased in by 1906. Since 1906, the ICD has been revised 9 times in recognition of new diseases (for example, Acquired Immunodeficiency Syndrome, or AIDS), increased knowledge of diseases, and changing terminology in describing diseases. The version currently in use, the ICD-10 (WHO 1992), was endorsed by the 43rd World Health Assembly in May 1990 and officially came into use in World Health Organization member states from 1994.

International Statistical Classification of Diseases and Related Health Problems, Australian Modification

The Australian modification of the ICD-10, referred to as the ICD-10-AM (NCCH 2010), is based on the ICD-10. The ICD-10 was modified for the Australian setting by the National Centre for Classification in Health, with assistance from clinicians and clinical coders. Despite the modifications, compatibility with the ICD-10 at the higher levels of the classification (that is, up to 4-character codes) has been maintained. The ICD-10-AM has been used to classify diagnoses in hospital records in all states and territories since 1999–2000 (AIHW 2000).

Remoteness Areas

The Remoteness Areas divide Australia for statistical purposes into broad geographic regions that share common characteristics of remoteness. The Remoteness Structure divides each state and territory into several regions on the basis of their relative access to services. There are 6 classes of Remoteness Area in the Remoteness Structure: *Major cities*, *Inner regional*, *Outer regional*, *Remote*, *Very remote* and *Migratory*. The category *Major cities* includes Australia's capital cities, except for Hobart and Darwin, which are classified as *Inner regional*. Remoteness Areas are based on the Accessibility and Remoteness Index of Australia, produced by the Australian Population and Migration Research Centre at the University of Adelaide.

Remoteness Area for screening data

Postcodes of participants were mapped to the 2016 Australian Statistical Geography Standard Remoteness Areas. Residential postcodes were used where available, with non-residential identifiers (such as post office boxes) used otherwise. As some postcodes can span different Remoteness Areas, a weighting for each Remoteness Area is attributed to the postcode. This can result in non-integer counts for remoteness classifications. For example, the Northern Territory postal area 0822 is classified as 62.3% *Very remote*, 20.3% *Remote* and 17.3% *Outer regional*. Participants with postcode 0822 have their counts apportioned accordingly.

Remoteness Area for incidence and mortality

Each unit record in the ACD contains 2011 Statistical Area Level 2 and 2016 Statistical Area Level 2, but not the Remoteness Area. To calculate both the cancer incidence rates and the cancer mortality rates by Remoteness Area, a correspondence was used to map the 2011 Statistical Area Level 2 to the 2011 Remoteness Area. The 2011 Statistical Area Level 2 classification was used for cancer cases as data were more complete using that than the 2016 Statistical Area Level 2 classification within the 2016 ACD. For consistency between incidence and mortality reporting, 2011 classifications were also used for mortality reporting.

Tables in this report based on geographical location were rounded to integer values. Where figures were rounded, discrepancies may occur between totals and sums of the component items. Participants whose postcode was not available in the remoteness correspondence were included in an 'Unknown' column in the relevant tables.

Classification of invasive breast cancer and ductal carcinoma in situ

Histology

Invasive breast cancer

Histology codes to classify invasive breast cancer into the groups that appear in Table 4.1 in this report were developed with the assistance of the state and territory cancer registries. Groupings for invasive breast cancers are listed in Table D1.

Table D1: Breast cancer by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Invasive ductal carcinoma	Pleomorphic carcinoma (8022)
	Carcinoma with osteoclast-like giant cells (8035)
	Basaloid carcinoma (8123)
	Scirrhous adenocarcinoma (8141)
	Carcinoma simplex (8231)
	Infiltrating duct carcinoma, NOS (8500)
	Duct carcinoma, desmoplastic type (8514)
	Infiltrating ductular carcinoma (8521)
	Infiltrating duct and lobular carcinoma (8522)
	Infiltrating duct mixed with other types of carcinoma (8523)
	Paget disease and infiltrating duct carcinoma of breast (8541)
	Paget disease and intraductal carcinoma of breast (8543)
Invasive lobular carcinoma	Pleomorphic lobular carcinoma, NOS (8519)
	Lobular carcinoma, NOS (8520)
	Infiltrating lobular mixed with other types of carcinoma (8524)
Medullary carcinoma and atypical medullary carcinoma	Medullary carcinoma, NOS (8510)
	Atypical medullary carcinoma (8513)
	Medullary carcinoma with lymphoid stroma (8512)

(continued)

Table D1 (continued): Breast cancer by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Tubular carcinoma and invasive cribriform carcinoma	Tubular adenocarcinoma (8211)
	Cribriform carcinoma, NOS (8201)
Mucinous carcinoma	Mucinous adenocarcinoma (8480)
	Mucin-producing adenocarcinoma (8481)
	Signet ring cell carcinoma (8490)
Invasive papillary carcinoma	Intraductal papillary adenocarcinoma with invasion (8503)
	Papillary adenocarcinoma, NOS (8260)
	Intracystic (papillary) adenocarcinoma (8504)
	Papillary carcinoma, NOS (8050)
	Solid papillary carcinoma (8509)
	Invasive micropapillary carcinoma (8507)
Inflammatory carcinoma	Inflammatory carcinoma (8530)
Mesenchymal	Sarcoma, NOS (8800)
	Spindle cell sarcoma (8801)
	Giant cell sarcoma (8802)
	Epithelioid sarcoma (8804)
	Undifferentiated sarcoma (8805)
	Fibrosarcoma (8810)
	Fibromyxosarcoma (8811)
	Low grade myofibroblastic sarcoma (8825)
	Malignant fibrous histiocytoma (8830)
	Liposarcoma, NOS (8850)
	Well differentiated liposarcoma, NOS (excluding superficial soft tissue) (8851)
	Myxoid liposarcoma (8852)
	Pleomorphic liposarcoma (8854)
	Leiomyosarcoma (8890)
	Angiomyosarcoma (8894)
	Myosarcoma (8895)
	Rhabdomyosarcoma (8900)
	Alveolar rhabdomyosarcoma (8920)
	Stromal sarcoma, NOS (8935)
	Haemangiosarcoma (9120)
	Haemangioendothelioma, malignant (9130)
	Haemangiopericytoma, malignant (9150)
	Lymphangiosarcoma (9170)
	Osteosarcoma, NOS (9180)
	Chondrosarcoma, NOS (9220)
Other—specified	Metaplastic carcinoma, NOS (8575)
	Adenocarcinoma with squamous differentiation (8570)

(continued)

Table D1 (continued): Breast cancer by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Other—specified (continued)	Adenocarcinoma with spindle cell metaplasia (8572)
	Squamous cell carcinoma, NOS (8070)
	Squamous cell carcinoma, keratinising, NOS (8071)
	Squamous cell carcinoma, large cell nonkeratinising, NOS (8072)
	Squamous cell carcinoma, spindle cell (8074)
	Spindle cell carcinoma, NOS (8032)
	Carcinosarcoma, NOS (8980)
	Adenocarcinoma with cartilaginous and osseous metaplasia (8571)
	Pseudosarcomatous carcinoma (8033)
	Malignant myoepithelioma (8982)
	Adenocarcinoma, NOS (8140)
	Phyllodes tumour, malignant (9020)
	Paget disease, mammary (8540)
	Adenocarcinoma with apocrine metaplasia (8573)
	Apocrine adenocarcinoma (8401)
	Neuroendocrine carcinoma, NOS (8246)
	Small cell carcinoma, NOS (8041)
	Carcinoma with neuroendocrine differentiation (8574)
	Large cell neuroendocrine carcinoma (8013)
	Carcinoid, NOS (8240)
	Atypical carcinoid tumour (8249)
	Adenocarcinoma with mixed subtypes (8255)
	Mixed cell adenocarcinoma (8323)
	Secretory carcinoma of breast (8502)
	Acinar cell carcinoma (8550)
	Mucoepidermoid carcinoma (8430)
	Lipid-rich carcinoma (8314)
	Glycogen-rich carcinoma (8315)
	Clear cell adenocarcinoma, NOS (8310)
	Sebaceous carcinoma (8410)
	Mixed tumour, malignant (8940)
	Lymphoepithelial carcinoma (8082)
	Basal cell adenocarcinoma (8147)
	Trabecular carcinoma (8190)
	Solid carcinoma, NOS (8230)
	Adenomyoepithelioma, malignant (8983)
	Adenoid cystic carcinoma (8200)
	Epithelial-myoepithelial carcinoma (8562)
	Peripheral neuroectodermal tumour, NOS (9364)

(continued)

Table D1 (continued): Breast cancer by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Other—specified (continued)	Granular cell tumour, malignant (9580)
	Adenosquamous carcinoma (8560)
	Comedocarcinoma, NOS (8501)
Unspecified	Neoplasm, malignant (8000)
	Tumour cells, malignant (8001)
	Malignant tumour, spindle cell type (8004)
	Carcinoma, NOS (8010)
	Large cell carcinoma, NOS (8012)
	Carcinoma, undifferentiated (8020)
	Carcinoma, anaplastic (8021)
	Giant cell and spindle cell carcinoma (8030)
	Giant cell carcinoma (8031)

Non-invasive breast tumours

Histology codes to classify non-invasive breast tumours were also developed with the assistance of the state and territory cancer registries. Groupings for non-invasive breast tumours are listed in Table D2. Only the histology codes for DCIS are relevant to this report, because other non-invasive breast tumours have not been reported here.

In interpreting incidence of non-invasive breast tumours, it should be noted that non-invasive tumours that are diagnosed within 4 months of an invasive breast cancer are excluded. This is referred to as the ‘4-month rule’ and is based on the consensus view that, in such a situation, the invasive breast cancer was almost certainly present at the time of the DCIS diagnosis, but was not detected.

The effect of applying this rule was the removal of any non-invasive records in which an invasive breast cancer was diagnosed in less than or equal to 121 days of a non-invasive tumour.

Table D2: Non-invasive breast tumours by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Ductal carcinoma in situ (DCIS)	Papillary carcinoma in situ, NOS (8050)
	Cribriform carcinoma in situ (8201)
	Ductal carcinoma in situ, solid type (8230)
	Papillary adenocarcinoma, NOS, in situ (8260)
	Apocrine adenocarcinoma in situ (8401)
	Intraductal carcinoma, non-infiltrating, NOS (8500)
	Comedocarcinoma, non-infiltrating (8501)
	Secretory carcinoma of breast in situ (8502)
	Non-infiltrating intraductal papillary adenocarcinoma (8503)
	Non-infiltrating intracystic carcinoma (8504)
	Intraductal micropapillary carcinoma (8507)
	Cystic hypersecretory carcinoma in situ (8508)

(continued)

Table D2 (continued): Non-invasive breast tumours by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Ductal carcinoma in situ (DCIS) (continued)	Solid papillary carcinoma in situ (8509)
	Non infiltrating ductular carcinoma (8521)
	Intraductal carcinoma and lobular carcinoma in situ (8522)
	Ductal carcinoma in situ mixed with other types of carcinoma in situ (8523)
	Paget disease, in situ, and intraductal carcinoma of breast (8543)
Lobular carcinoma in situ (LCIS)	Pleomorphic lobular carcinoma in situ (8519)
	Lobular carcinoma in situ, NOS (8520)
Other specified carcinoma in situ	Squamous cell carcinoma in situ, NOS (8070)
	Adenocarcinoma in situ (8140)
	Mucinous adenocarcinoma in situ, NOS (8480)
	Paget disease, in situ, mammary (8540)
	Adenocarcinoma in situ with squamous metaplasia (8570)
Unspecified	Carcinoma in situ, NOS (8010)

Appendix E: Statistical methods

Comparisons and tests of statistical significance

This report includes statistical tests of the significance of comparisons of rates between population groups. Any statistical comparison applied to 1 variable must take account of any other potentially relevant variables. For example, any comparison of participation by state must also take account of differences in the distribution of age and sex between the states. These other variables are known as ‘confounding’ variables.

Crude rates

A ‘crude rate’ is defined as the number of events over a specified period of time (for example, a year) divided by the total population. (For example, a crude cancer incidence rate is defined as the number of new cases of cancer in a specified period of time, divided by the population at risk.) Crude mortality rates and cancer incidence rates are expressed in this report as number of deaths or new cases per 100,000 population. ‘Crude participation rate’ is expressed as a percentage.

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. They are 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 (for example, 100,000) 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 in 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 using age-standardised rates, with such rates adjusted for age in order to facilitate comparisons between populations that have different age structures—for example, between Indigenous people and other Australians. 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 others (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 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 group or those who lived 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 10,000 or 100,000, as appropriate.

Confidence intervals

Population numbers for incidence and mortality and screening have a natural level of variability for a single year above and below what might be expected in the mean over many years. The percentage variability is small for large population numbers but high for small numbers such as mortality in a young age group. One measure of the likely difference is that of standard error, which indicates the extent to which a population number might have varied by chance in only 1 year of data. In the 95% confidence interval, there are around 19 chances in 20 that the difference will be less than 2 standard errors.

There are several methods for calculating confidence intervals. The 95% confidence intervals (CIs) in this report were calculated using a method developed by Dobson and others (1991). This method calculates approximate confidence intervals for a weighted sum of Poisson parameters.

Interpretation of confidence intervals

Some indicators have a 95% confidence interval presented along with the rates. This is because the observed value of a rate may vary due to chance, even where there is no variation in the underlying value of the rate. The 95% confidence interval represents a range (interval) over which variation in the observed rate is consistent with this chance variation. In other words, there is a 95% chance that the true value of the rate is somewhere within this range.

These confidence intervals can be used as a guide to whether differences in a particular rate are consistent with chance variation. Where the confidence intervals do not overlap, the difference between rates is greater than that which could be explained by chance, and is regarded as statistically significant.

It is important to note that the overlapping of confidence intervals does not imply that the difference between 2 rates is definitely due to chance. Instead, an overlapping confidence interval represents a difference in rates that is too small to allow differentiation between a real difference and one that is due to chance variation. It can therefore only be stated that no statistically significant differences were found, and not that no differences exist.

The approximate comparisons presented might understate the statistical significance of some differences, but they are sufficiently accurate for the purposes of this report.

As with all statistical comparisons, care should be exercised in interpreting the results of the comparison. If 2 rates are statistically significantly different from each other, this means that the difference is unlikely to have arisen by chance. Judgment should, however, be exercised in deciding whether or not the difference is of any clinical significance.

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Abbreviations

ABDS	Australian Burden of Disease Study
ABS	Australian Bureau of Statistics
ACD	Australian Cancer Database
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
AS	age-standardised
ASR	age-standardised rate
CI	confidence interval
DALY	disability-adjusted life year
DCIS	ductal carcinoma in situ
DRF	Death Registration Form
ICD	International Classification of Disease
IRSD	Index of Relative Socio economic Disadvantage
MCCD	Medical Certificate of Cause of Death
NAS	National Accreditation Standards
NCSP	National Cervical Screening Program
NMD	National Mortality Database
NOS	not otherwise specified
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RA	remoteness area
SA	South Australia
SEIFA	Socio Economic Indexes for Areas
SCU	State Coordination Unit
Tas	Tasmania
Vic	Victoria
WA	Western Australia
YLD	years lived with disability
YLL	years of life lost

Symbols

. .	not applicable
n.p.	not publishable because of small numbers, confidentiality or other concerns about the quality of the data
<	less than
≤	less than or equal to
>	greater than

Glossary

Note: Terms in bold within definitions are defined elsewhere in the glossary.

Aboriginal or Torres Strait Islander: A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. See also **Indigenous**.

age-specific rate: A rate for a specific age group. The numerator and denominator relate to the same age group.

age-standardised rate: 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, which allows comparison of disease rates.

assessment: Further investigation of a mammographic abnormality or symptom reported at **screening**.

Australian Statistical Geography Standard (ASGS): Common framework defined by the Australian Bureau of Statistics for collection and dissemination of geographically classified statistics. The ASGS replaced the Australian Standard Geographical Classification (ASGC) in July 2011.

benign: Not **malignant**.

biopsy: Small sample of tissue that is taken to obtain a definitive diagnosis of an abnormality.

BRCA1 or BRCA2 mutation: BRCA1 and BRCA2 are human genes that produce tumour suppressor proteins. These proteins help repair damaged DNA and, therefore, play a role in ensuring the stability of the cell's genetic material. When either of these genes is mutated, or altered, such that its protein product either is not made or does not function correctly, DNA damage may not be repaired properly. As a result, cells are more likely to develop additional genetic alterations that can lead to cancer.

cancer death: A death where the **underlying cause of death** is indicated as cancer. People with cancer who die of other causes are not counted in the **mortality** statistics in this publication.

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

confidence interval: A range determined by variability in data, within which there is a specified (usually 95%) chance that the true value of a calculated parameter lies.

DALY (disability-adjusted life years): Measure (in years) of healthy life lost, either through premature death defined as dying before the expected life span at the age of death (YLL) or, equivalently, through living with ill health due to illness or injury (YLD).

ductal carcinoma in situ (DCIS): A non-invasive tumour of the mammary gland (breast) arising from cells lining the ducts.

false negative: A test that has incorrectly observed that the disease is not present.

false positive: A test that has incorrectly observed that the disease is present.

first screening round: See **screening round**.

in situ: A Latin term meaning in place or position; undisturbed.

incidence: The number of new cases (for example, of an illness or event) occurring during a given period, usually 1 year.

index screening year: The year for which an **interval cancer** rate and program sensitivity rate are determined.

index screens: All screening examinations performed within the index screening year.

Indigenous: A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. See also **Aboriginal or Torres Strait Islander**.

interval cancer (invasive): (as defined for national reporting purposes by Kavanagh and others (1999), with minor changes endorsed by the then-named National Advisory Committee):

- an invasive breast cancer diagnosed after completion of a negative screening episode and before the next screening examination (within 24 months from the date of the previous screen)
- a case of invasive breast cancer that is diagnosed at early review or in the interval between assessment and early review, where the recommendation for early review is 6 months or more from the screening date
- breast cancer diagnosed in a woman by BreastScreen Australia within 24 months of a negative screen (early rescreen) if the woman presents with a breast lump and/or clear or bloodstained nipple discharge in the breast in which the breast cancer is diagnosed
- an invasive breast cancer diagnosed between 6 and 24 months after a recommendation for assessment is made and a woman fails to attend assessment.

invasive cancer: A **tumour** whose cells have spread locally and have the potential to spread to nearby healthy or normal tissue or to more distant parts of the body.

malignant: Abnormalities in cells or tissues consistent with **cancer**.

mammogram: A radiographic depiction of the breast.

menarche: The first menstrual period.

menopause: Permanent cessation of menstruation.

morbidity: Illness.

mortality: The number of deaths occurring during a given period.

new case (of cancer): A person who has a new cancer diagnosed for the first time. One person may have more than one cancer and therefore may be counted twice in **incidence** statistics if it is decided that the two cancers are not of the same origin. This decision is based on a series of principles set out in more detail in a publication by Jensen and others (1991).

rescreening: The next screening examination after the screening episode in the index screening year.

risk factor: An attribute or exposure that is associated with an increased probability of a specified outcome, such as the occurrence of a disease. Risk factors are not necessarily the causes of disease.

screening: The performance of tests on apparently well people in order to detect a medical condition at an earlier stage than would otherwise be the case.

screening episode: All attendances for screening and assessment within 6 months relating to a particular round of screening. It starts at the date of attendance for screening. It is completed when:

- a recommendation is made to return the woman to routine rescreening
- a recommendation is made for early review at 6 months or more from the screening date
- a diagnosis of cancer is made
- the woman fails to attend for technical recall or assessment within 6 months
- the woman dies.

screening round: The first screening round is a woman's first visit to a mammography screening service; a subsequent screening round means that she has been screened before. For example, if she attends for a fourth screening round, she has been screened 3 times before.

significant difference: Where rates are referred to as significantly different, or one rate is deemed significantly higher or lower than another, these differences are statistically significant. Rates are deemed statistically significantly different when their **confidence intervals** do not overlap, since their difference is greater than what could be explained by chance. See 'confidence intervals' in Appendix E for more information.

symptom: Any evidence of disease apparent to the patient. For the purposes of this report, symptoms refer to a self-reported breast lump and/or bloodstained or watery nipple discharge.

target population: Women in the population who are actively targeted by BreastScreen Australia; this is done on the basis of age, and was women aged 50–69 until July 2013, after which time this changed to women aged 50–74.

tumour: An abnormal growth of tissue. Can be **benign** (not a cancer) or **malignant** (cancer).

ultrasound: Diagnostic method based on the reflection of ultrasonic sound waves generated through scanning of, in this case, the breast. The reflections are viewed on a computer screen or photograph, and checked for variations in images.

underlying cause of death: The condition, disease or injury initiating the sequence of events leading directly to death; that is, the primary, chief or principal cause.

women-years: The denominator for the interval cancer rate, it is the 'number of years at risk' of being diagnosed with an interval cancer, and takes into account women who screen annually rather than every 2 years (who would be at risk for the first year after their screen but not the second).

YLD (years lived with disability): A measure of the years of what could have been a healthy life but were instead spent in states of less than full health. YLD represent non-fatal burden.

YLL (years of life lost): Years of life lost due to premature death, defined as dying before the global ideal life span at the age of death. YLL represent fatal burden.

References

ABS (Australian Bureau of Statistics) 2018. Estimates of Aboriginal and Torres Strait Islander Australians, June 2016. ABS cat. no. 3238.0.55.001. Canberra: ABS.

AIHW (Australian Institute of Health and Welfare) 2010. Risk of invasive breast cancer in women diagnosed with ductal carcinoma in situ in Australia between 1995 and 2005. Cancer series no. 51. Cat. no. CAN 47. Canberra: AIHW.

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 2018. Analysis of breast cancer outcomes and screening behaviour for BreastScreen Australia. Cancer series no.113. Cat. no. CAN 118. Canberra: AIHW.

AIHW 2019a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2015. Australian Burden of Disease Study series no. 19. Cat. no. BOD 22. Canberra: AIHW.

AIHW 2019b. BreastScreen Australia data dictionary: version 1.2. Cancer series no. 123. Cat. no. CAN 127. Canberra: AIHW.

AIHW 2019c. Australian Burden of Disease Study: methods and supplementary material 2015. Australian Burden of Disease Study no. 20. Cat. no. BOD 23. Canberra: AIHW.

AIHW 2020. Cancer data in Australia. Cat. no. CAN 122. Canberra: AIHW. Viewed 3 August 2020, https://www.aihw.gov.au/reports/cancer/cancer-data-in-australia/contents/summary.

AIHW & NBCC (National Breast Cancer Centre) 2007. Breast cancer survival by size and nodal status in Australia. Cancer series no. 39. Cat. no. CAN 34. Canberra: AIHW.

Breast Cancer Network Australia 2013. Family history fact sheet. Melbourne: Breast Cancer Network Australia. Viewed 18 August 2019, https://www.bcna.org.au/resource/fact-sheet-family-history/.

BreastScreen Australia 2004. BreastScreen Australia National Accreditation Standards, developed by the National Quality Management Committee of BreastScreen Australia, endorsed by the Australian Screening Advisory Committee, November 2004. Canberra: Department of Health and Ageing.

BreastScreen Australia EAC (Evaluation Advisory Committee) 2009. BreastScreen Australia evaluation: evaluation final report. Canberra: Department of Health and Ageing. Viewed 3 August 2020, http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/programme-evaluation.

BreastScreen WA 2008. BreastScreen WA: statistical report 2000–2005.Perth: BreastScreen WA.

Brenner H & Gefeller O 1996. An alternative approach to monitoring cancer patient survival. Cancer 78(9):2004–10.

Cancer Australia 2009. Early detection of breast cancer. Sydney: Cancer Australia. Viewed 3 August 2020, https://canceraustralia.gov.au/publications-and-resources/position-statements/early-detection-breast-cancer.

Cancer Australia 2014. Overdiagnosis from mammographic screening. Sydney: Cancer Australia. Viewed 3 August 2020, https://canceraustralia.gov.au/publications-and-resources/position-statements/overdiagnosis-mammographic-screening.

Cancer Australia 2015. Advice about familial aspects of breast cancer and epithelial ovarian cancer: a guide for health professionals. Sydney: Cancer Australia. Viewed 3 August 2020, https://www.canceraustralia.gov.au/publications-and-resources/cancer-australia-publications/advice-about-familial-aspects-breast-cancer-and-epithelial-ovarian-cancer.

Cancer Research UK 2014. Breast cancer risk factors. London: Cancer Research UK. Viewed 3 August 2020, http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer/risk-factors.

De P, Neutel CI, Olivotto I & Morrison H 2010. Breast cancer incidence and hormone replacement therapy in Canada. Journal of the National Cancer Institute 102(19):1489–95.

Dobson AJ, Kuulasmaa K, Eberle E & Scherer J 1991. Confidence intervals for weighted sums of Poisson parameters. Statistics in Medicine 10(3):457–62.

Duffy SW, Tabar L, Olsen AH, Vitak B, Allgood PC, Chen TH et al. 2010. Absolute numbers of lives saved and overdiagnosis in breast cancer screening, from a randomized trial and from the Breast Screening Programme in England. Journal of Medical Screening 17(1):25–30.

Eusebi V, Feudale E, Foschini MP, Micheli A, Conti A, Riva C et al. 1994. Long-term follow-up of in situ carcinoma of the breast. Seminars in Diagnostic Pathology 11(3):223–35.

IARC (International Agency for Research on Cancer) 2002. IARC handbooks of cancer prevention. Volume 7: breast cancer screening. Lyon, France: IARC Press.

Irwig L, Glasziou P, Barratt A & Salkeld G 1997. Review of the evidence about the value of mammographic screening in 40–49 year old women. Sydney: NHMRC (National Health and Medical Research Council) and NBCC (National Breast Cancer Centre).

Jensen OM, Parkin DM, MacLennan R, Muir CS & Skeet RG (eds) 1991. Cancer registration: principles and methods. IARC scientific publication no. 95. Lyon: International Agency for Research on Cancer.

Kavanagh AM, Amos AF & Marr GM 1999. The ascertainment and reporting of interval cancers within the BreastScreen Australia Program. Sydney: NHMRC and NBCC.

Kuchenbaecker KB, Hopper JL, Barnes DR, Phillips KA, Mooij TM, Roos-Blom MJ et al. 2017. Risks of breast, ovarian, and contralateral breast cancer for BRCA1 and BRCA2 mutation carriers. Journal of the American Medical Association 317(23):2402–16.

Lauby-Secretan B, Scoccianti C, Loomis D, Benbrahim-Tallaa L, Bouvard V, Bianchini F et al. 2015. Breast-cancer screening—viewpoint of the IARC Working Group. New England Journal of Medicine 372(24):2,353–58.

McPherson K, Steel CM & Dixon JM 2000. Breast cancer—epidemiology, risk factors, and genetics. British Medical Journal 321(7261):624–28.

NBOCC (National Breast and Ovarian Cancer Centre) 2009. National Breast and Ovarian Cancer Centre and Royal Australasian College of Surgeons National Breast Cancer audit. Public Health Monitoring Series 2007 data. Sydney: NBOCC.

Standing Committee on Screening 2016. Population Based Screening Framework. Report prepared for the Community Care and Population Health Principal Committee of the Australian Health Ministers' Advisory Council. Canberra: Department of Health. Viewed 3 August 2020, http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/population-based-screening-framework.

UICC (Union for International Cancer Control) 2014. IARC release the latest world cancer statistics. Geneva: UICC. Viewed 11 August 2020, http://www.uicc.org/iarc-release-latest-world-cancer-statistics.

WCRF/AICR (World Cancer Research Fund & American Institute for Cancer Research) 2007. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington DC: AICR.

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Related publications

The *BreastScreen Australia monitoring report* is an annual report. This and previous BreastScreen Australia monitoring reports and their supplementary data tables are available from the AIHW website https://www.aihw.gov.au/reports-data/health-welfare-services/cancer-screening/reports.

The following related publications may also be of interest:

AIHW (Australian Institute of Health and Welfare) 2020. Cancer data in Australia. Cat no. CAN 122. Canberra: AIHW.

AIHW 2020. National Bowel Cancer Screening Program: monitoring report 2020. Cancer series no. 128. Cat. no. CAN 133. Canberra: AIHW.

AIHW 2020. National cancer screening programs participation data. Cat no. CAN 114. Canberra: AIHW.

AIHW 2019. BreastScreen Australia data dictionary: version 1.2. Cancer series no. 123. Cat. no. CAN 127. Canberra: AIHW.

AIHW 2019. Cancer in Australia 2019. Cancer series no. 119. Cat. no. CAN 123. Canberra: AIHW.

AIHW 2019. Cervical screening in Australia 2019. Cancer series no. 123. Cat. no. CAN 124. Canberra: AIHW.

AIHW 2019. National Cervical Screening Program monitoring report 2019. Cancer series no. 125. Cat. no. 132. Canberra: AIHW.

AIHW 2018. Analysis of bowel cancer outcomes for the National Bowel Cancer Screening Program 2018. Cat. no. CAN 113. Canberra: AIHW.

AIHW 2018. Analysis of breast cancer outcomes and screening behaviour for BreastScreen Australia. Cancer series no. 113. Cat. no. CAN 118. Canberra: AIHW.

AIHW 2018. Analysis of cancer outcomes and screening behaviour for national cancer screening programs in Australia. Cancer series no. 111. Cat. no. CAN 115. Canberra: AIHW.

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.

Supplementary online data tables

Additional tables are available as online Excel tables at www.aihw.gov.au, under the ‘Additional material’ tab for this report. These tables contain detailed statistics for many of the tables and figures presented in summary form in both the body of the report and Appendix A. Supplementary data tables have the prefix ‘S’ (for example, ‘Table S1.1’).

There are 8 Excel files, 1 for each performance indicator:

Indicator 1: Participation
Indicator 2: Rescreening
Indicator 3: Recall to assessment
Indicator 4: Invasive breast cancer detection
Indicator 5: DCIS detection
Indicator 6: Sensitivity
Indicator 7: Incidence
Indicator 8: Mortality.

55% of women in the target age group of 50–74 participated in BreastScreen Australia in 2017–2018, with more than 1.8 million screening.

Breast cancer mortality has decreased since BreastScreen Australia began, from 74 deaths per 100,000 women aged 50–74 in 1991, to 40 deaths per 100,000 women in 2018.

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