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Contents

Summary

Cancer screening involves testing for signs of cancer or precancerous conditions in people without obvious symptoms. BreastScreen Australia is one of Australia's three population-based cancer screening programs. 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.

BreastScreen Australia provides free 2-yearly screening mammograms to women aged 40 and over, and actively targets women aged 50–74.

This report is the latest in the annual *BreastScreen Australia monitoring report* series and presents the latest data available for each performance indicator.

Terminology

This document uses the terms 'participant' and 'participants' when referring to data collected under BreastScreen Australia. These data are not restricted by sex or gender, with all participants in breast screening included in these data.

For breast cancer screening data, 'participant' or 'participants' is defined as a person having breast tissue that is suitable for breast cancer screening and who has engaged BreastScreen Australia through a screening and/or assessment appointment or visit.

Screening participants may include women, transgender men, transgender women, non-binary people or other gender diverse people. State and territory BreastScreen services provide advice on BreastScreen and gender, including whether screening for breast cancer may benefit transgender women, transgender men, non-binary, and gender diverse people.

This document uses the term 'women' to mean 'female' when referring to cancer incidence data and cancer mortality data, as these data sources are based on sex assigned at birth. However, it should be noted that some people may not identify with this term.

This document uses the term 'breast' to refer to the tissue affected by breast cancer. While the term 'breast' may be used as a gendered word in some instances, its use in this report is non-gendered and medical.

Recruitment

The most recent complete participation data are for participants who had a screening mammogram in the years 2021 and 2022, with preliminary data for the years 2022 and 2023.

Over the 2 years 2022–2023, more than 1.9 million participants aged 50–74 were screened through BreastScreen Australia – 52% of the target population. This was a little higher than the more than 1.8 million who screened over the 2 years 2021–2022, which was 50% of the target population.

Prior to these years, the age-standardised participation rate remained between 53% and 54% from 2014–2015 to 2018–2019 before decreasing to 49% and 47% in 2019–2020 and 2020–2021, respectively, due to the impact of the COVID-19 pandemic. Thereafter, age-standardised participation increased to 50% in 2021–2022 and 51% in 2022–2023.

The proportion of participants aged 50–72 who rescreened within 27 months was 51% after having their first screen through BreastScreen Australia in 2020, 60% after their second screen in 2020, and 76% after having their third or higher screen in 2020. Similar to participation, rescreening has also decreased due to the impact of the COVID-19 pandemic.

Screening

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

In 2022, 11% of participants aged 50–74 who screened for the first time, and 4% of participants aged 50–74 attending a subsequent screen, had a screening mammogram result indicating they should be recalled for further investigation.

These recall to assessment rates are similar to those in 2021.

Diagnosis

BreastScreen Australia aims to maximise the detection of invasive breast cancers, particularly small cancers, to achieve the desired reductions in morbidity and mortality.

In 2022, 5,881 participants aged 50–74 had an invasive breast cancer detected through BreastScreen Australia. Invasive breast cancer detection rates in 2022 for participants aged 50–74 were:

- 103 per 10,000 participants screened for the first time
- 57 per 10,000 participants attending a subsequent screen

Invasive breast cancer detection is higher for participant's who screen for the first time because a participant's first visit detects prevalent cancers that may have been present for some time rather than incident cancers that have grown between screens.

Small breast cancers (≤15 mm in diameter) tend to be associated with more treatment options, lower morbidity and improved survival.

In 2022, 3,386 participants aged 50–74 had a small (≤15 mm) invasive breast cancer detected through BreastScreen Australia. This was equivalent to 44% of invasive breast cancers detected in participants attending their first screen, and 60% of invasive breast cancers detected in those attending subsequent screens.

Outcomes

Breast cancer is the most common cancer diagnosed in Australian women.

In 2020, 10,921 new cases of invasive breast cancer were diagnosed in women aged 50–74, equivalent to 307 new cases per 100,000 women in the population.

In the years before BreastScreen Australia began in 1991, incidence rose from around 180 new cases per 100,000 women aged 50–74 in 1982 to around 220 in 1990. Incidence thereafter rose from 240 new cases in 1991 to around 300 new cases per 100,000 aged 50–74 in 2000, where it remained until the years 2013 to 2019 during which it was around 320 new cases per 100,000 women. Incidence then decreased to 300 new cases per 100,000 women aged 50–74 in 2020.

Breast cancer is the second most common cause of cancer-related death in Australian women, behind lung cancer. In 2022, 1,404 women aged 50–74 died from breast cancer, equivalent to 38 deaths per 100,000 women in the population.

Breast cancer mortality has decreased since BreastScreen Australia began—from 74 deaths per 100,000 women aged 50–74 in 1991 to around 40 deaths per 100,000 since 2014.

Aboriginal and Torres Strait Islander women

BreastScreen Australia outcomes are reported for Aboriginal and Torres Strait Islander women for the performance indicators participation, incidence, and mortality.

Over the 2 years 2021–2022, around 28,000 Aboriginal and Torres Strait Islander participants aged 50–74 were screened through BreastScreen Australia – 37% of Aboriginal and Torres Strait Islander women in the target population.

After adjusting for age, participation was 25% lower for Aboriginal and Torres Strait Islander women than for non-Indigenous women.

In 2016–2020, 818 Aboriginal and Torres Strait Islander women aged 50–74 were diagnosed with breast cancer. After adjusting for age, incidence was 7% lower for Aboriginal and Torres Strait Islander women than for non-Indigenous women.

In 2018–2022, 154 Aboriginal and Torres Strait Islander women aged 50–74 died from breast cancer. After adjusting for age, mortality was 37% higher for Aboriginal and Torres Strait Islander women than for non-Indigenous women.

Data at a glance

Table 1: Summary of BreastScreen Australia performance indicators

Performance indicator	Number	Crude rate
Participation 2021–2022	1,820,994	50.1%
Rescreening 2020		
After first screening round	32.103	50.9%
After second screening round	44,472	59.5%
After third and subsequent screening rounds	485,739	76.0%
Recall to assessment 2022		
First screening round	9,880	11.0%
Subsequent screening rounds	33,704	3.9%
Invasive breast cancer detection 2022		
First screening round	931	103.2
Subsequent screening rounds	4,950	57.0
All screening rounds	5,881	61.3
All screening rounds, small breast cancer detection	3,386	35.3
Ductal carcinoma in situ detection 2022		
First screening round	234	25.9
Subsequent screening rounds	1,248	14.4
All screening rounds	1,482	15.5
Interval cancers 2017, 2018 and 2019		
In the first year after a negative screen	1,812	6.4
In the second year after a negative screen	3,068	11.8
Program sensitivity 2017, 2018 and 2019		
In the 2 years after a negative screen	. .	77.6%
Invasive breast cancer incidence 2020	10,921	306.7
Ductal carcinoma in situ incidence 2020	1,667	46.8
Mortality 2022	1,404	38.4

Notes

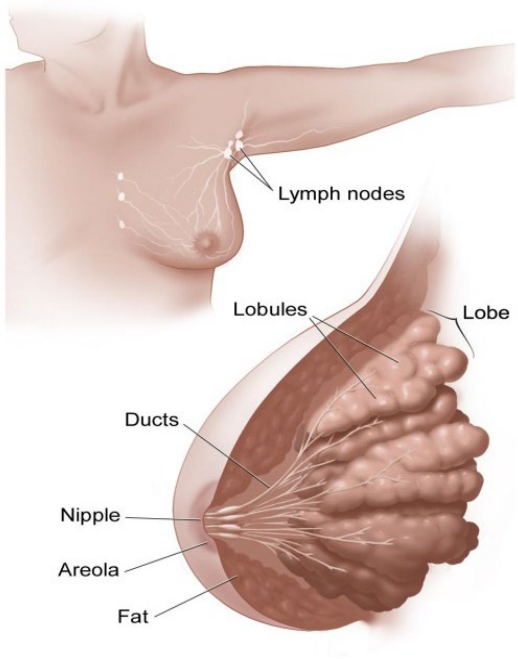
1. For Rescreening: first screening round is a participant's first screen at a BreastScreen service; second screening round is a participant's second screen at a BreastScreen service; third and subsequent is a participant's third or more screen at a BreastScreen service.
2. For Recall to assessment, Invasive breast cancer detection, and Ductal carcinoma in situ detection: first screening round is a participant's first screen at a BreastScreen service; subsequent screening round is a participant's second or more screen at a BreastScreen service.
3. Crude rates for 'Invasive breast cancer detection', 'Ductal carcinoma in situ detection' and 'Interval cancers' are per 10,000 participants screened.
4. Crude rates for 'Invasive breast cancer incidence', 'Ductal carcinoma in situ incidence' and 'Mortality' are per 100,000 women in the population.
5. All data shown are for the target age group 50–74.

1 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 2020; it is second only to lung cancer in cancer deaths (AIHW 2023b). 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.

1.1 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 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 2022b).

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 gene 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).

Risk related to family history can be split into 3 categories (Cancer Australia 2015a):

- '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.
- '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).
- '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).

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).

Although most breast cancers occur in women over the age of 50, 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, including women, men, and non-binary people, to be aware of how their breasts normally look and feel and promptly report any new or unusual changes to their general practitioner.

1.2 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 mammographically 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 81% of breast cancers occurring in women aged 50 and over (AIHW 2023b).

Mammographic screening is not recommended for women younger than 40 (Lauby-Secretan et al. 2015) as breast tissue in pre-menopausal women tends to be mammographically 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; Cancer Australia 2015b).

1.3 Burden of breast cancer

Burden of disease analysis measures the combined fatal and non-fatal impacts of diseases and injuries on a population.

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) 2023. The ABDS 2023 provides Australia-specific burden of disease estimates best matched to the Australian context for the total 2023 population. In the ABDS 2023, the cancer and other neoplasms disease group also includes the impact of benign, in situ and uncertain neoplasms.

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 2023, cancer was the disease group with the highest burden—18% of the total disease burden. Most (91%) of the burden from cancer was due to dying prematurely, with only a small proportion (8.6%) due to living with a cancer diagnosis (AIHW 2023a).

Breast cancer was the leading cause of cancer burden for females in 2023, with 72,648 DALY, accounting for 18% of the total cancer burden for females. It was the third-leading cause of cancer burden for persons, at 7.9% (AIHW 2023a). Breast cancer was responsible for around one-quarter of the cancer burden in women aged 25–44 (7,848 DALY; 26%) and 45–64 (32,203 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 1.1.

Table 1.1: Leading causes of cancer burden (DALY), leading causes of fatal cancer burden (YLL), and leading causes of non-fatal cancer burden (YLD), females, 2023

	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	17.6	Lung cancer	17.9	Breast cancer	31.2
2	Lung cancer	16.8	Breast cancer	16.3	Bowel cancer	9.1
3	Bowel cancer	10.3	Bowel cancer	10.4	Benign and uncertain brain tumours	5.7
4	Pancreatic cancer	6.8	Pancreatic cancer	7.3	Lung cancer	5.3
5	Ovarian cancer	5.0	Ovarian cancer	5.2	Melanoma of the skin	4.8
6	Other malignant neoplasms (cancers)	4.7	Other malignant neoplasms (cancers)	4.8	Other malignant neoplasms (cancers)	3.8
7	Brain and central nervous system cancer	3.9	Brain and central nervous system cancer	4.1	Ovarian cancer	3.5
8	Liver cancer	3.4	Liver cancer	3.7	Uterine cancer	3.5
9	Uterine cancer	3.3	Uterine cancer	3.3	Other blood cancers	2.7
10	Unknown primary	2.9	Unknown primary	3.1	Non-Hodgkin lymphoma	2.6
	Leading 10 cancers	**74.7**	**Leading 10 cancers**	**76.1**	**Leading 10 cancers**	**72.2**
	All other cancers	*25.3*	*All other cancers*	*23.9*	*All other cancers*	*27.8*
	Total	**100.0**	**Total**	**100.0**	**Total**	**100.0**

Note: Rankings exclude the residual disease 'other benign, *in situ* and uncertain neoplasms'.

Source: AIHW 2023a.

2 BreastScreen Australia

In Australia, population-based breast cancer screening is available through BreastScreen Australia. First established in 1991, BreastScreen Australia is a joint program of the Australian and state and territory governments. 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.

Women in the target age group 50–74 are offered 2-yearly screening mammograms through BreastScreen Australia, with women aged 40–49 and 75 and over also eligible to attend.

Transgender women, transgender men, non-binary, and gender diverse people who have breast tissue suitable for breast cancer screening can seek advice from state and territory BreastScreen services as to whether screening for breast cancer may benefit them.

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).

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).

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 (those aged 50–74).

While mammographic screening reduces breast cancer deaths by detecting cancers earlier, some breast cancers detected through screening might not otherwise have been diagnosed during a woman's lifetime. This is referred to as 'overdiagnosis'. However, it is not currently possible to predict at diagnosis to which cancers 'overdiagnosis' would apply (see Box 2.1 for more information about 'overdiagnosis' and Cancer Australia's position statement on this).

For more information about BreastScreen Australia, see Appendix B.

Box 2.1: '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).

2.1 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, Interval cancers and Program 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.

Different policies across state and territory BreastScreen programs affects breast cancer detection rates, recall to assessment rates and interval cancer rates. Breast cancer detection and interval cancer rates will be impacted by the jurisdictions policies related to screening clients with symptoms, as well as policies related to annual screening.

2.2 BreastScreen Australia and National Accreditation Standards (NAS) Measures

The provision of a high-quality service 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 reported against these Measures. This is 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.

2.3 Impact of COVID-19

COVID-19 is a coronavirus disease caused by a new coronavirus called SARS-CoV-2 (short for severe acute respiratory syndrome coronavirus 2) that was first reported to the World Health Organization (WHO) in December 2019 (WHO 2020). The coronavirus that causes COVID-19 spread quickly after it was first reported and was declared an international pandemic by WHO on 11 March 2020.

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. COVID-19 restrictions were introduced in Australia from March 2020. Many health care services suspended or changed the way they delivered their services at this time. Due to this, there was the potential for people to change their behaviour whilst under restrictions, which may have included access to BreastScreen Australia services.

To protect clients, staff, and the community from the risk of COVID-19, BreastScreen Australia services were suspended nationwide from 25 March 2020. The suspension was lifted around a month later for most services, but a staged approach was introduced with longer appointment times and precautionary measures to ensure the safety of clients and staff. The rate at which BreastScreen services could resume was affected by jurisdictional social distancing and infection control guidelines. Most BreastScreen services stayed open, with these additional precautionary measures, for the following years, despite additional lockdowns and increasing numbers of cases of COVID-19.

The effects of lower participation over the years 2020, 2021, and 2022 are apparent in the data presented in this report, with many performance indicators reporting on data for the years 2021 and 2022.

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.

Box 2.2: Impact of COVID-19 on Estimated Resident Populations.

The COVID-19 pandemic and the resulting Australian Government closure of the international border from 20 March 2020, caused significant disruptions to the usual Australian population trends. This report uses Australian Estimated Resident Population (ERP) estimates that reflect these disruptions.

In the 12-month period July 2020 to June 2021, the overall population growth was much smaller than the years prior, and in particular, there was a relatively large decline in the population of Victoria. ABS reporting indicates these were primarily due to net-negative international migration (ABS 2021).

This change in the usual population trends may complicate interpretation of statistics calculated from these ERPs. For example, rates and proportions may be greater than in previous years due to decreases in the denominator (population) of some sub-populations.

3 Performance indicators

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 Section 3.

Recruitment

In 2021–2022, 1,820,994 participants aged 50–74 participated in BreastScreen Australia, a crude participation rate of 50.1% of the eligible population (Table A1.1).

Among participants aged 50–72 who screened in 2020, 72.4% (562,314) rescreened within 27 months (Figure 3.1).

Screening and assessment

Among participants aged 50–74 who participated in BreastScreen Australia in 2022, 11.0% of those who attended their first screen, and 3.9% of those attending a subsequent screen, were recalled to assessment for further investigation (Table A3.1).

Diagnosis

In 2022, 5,881 participants aged 50–74 had invasive breast cancer detected through BreastScreen Australia, which equates to a crude rate of 61.3 per 10,000 participants (Figure 3.1). Of these, 57.6% (3,386) had a small (≤15 mm) cancer detected, a crude rate of 35.3 per 10,000 participants (Table A4.6).

There were 1,482 participants aged 50–74 who had ductal carcinoma in situ (DCIS) detected through BreastScreen Australia in 2022, a crude rate of 15.5 per 10,000 participants (Figure 3.1).

For participants aged 50–74 who screened in 2017, 2018 and 2019, there were 9.0 interval cancers per 10,000 participants in the 0–24 months after a negative screening episode for all screening rounds (Figure 3.1).

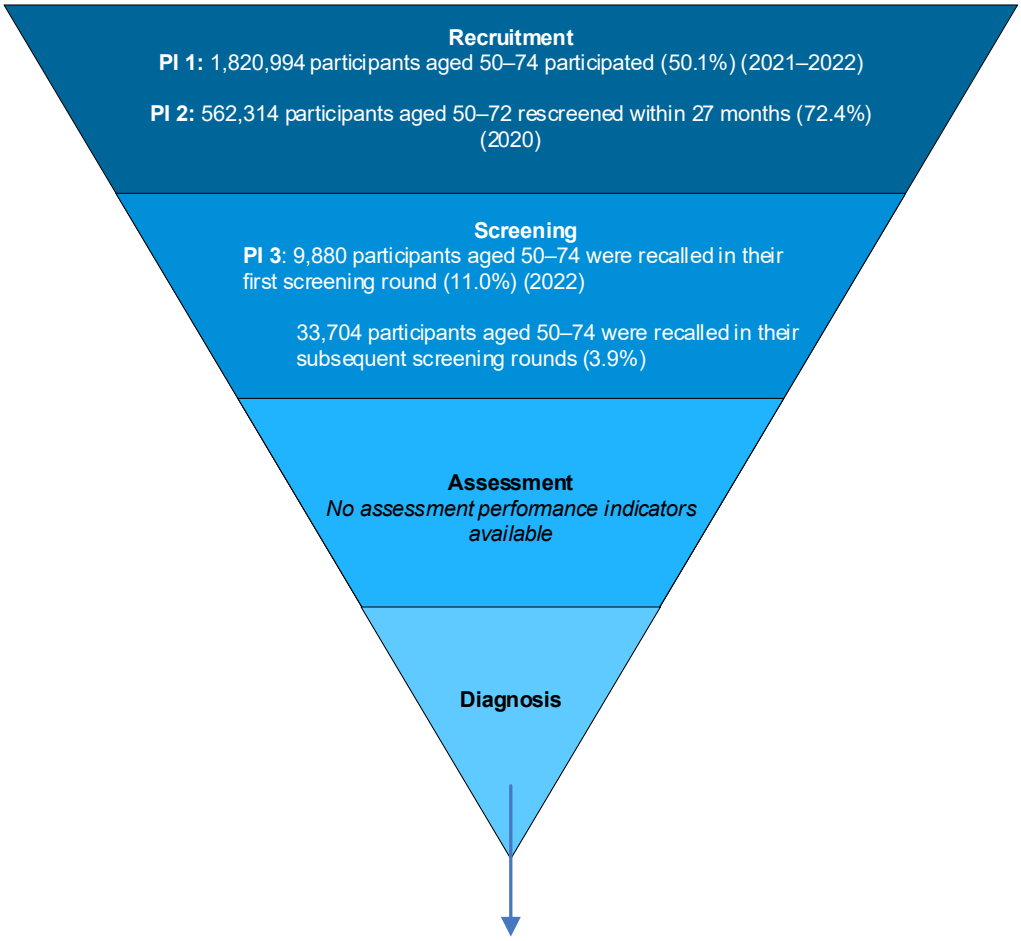
In 2017, 2018 and 2019, program sensitivity in the 0–24 months for all screening rounds was 77.6% for participants aged 50–74 (Figure 3.1).

Outcomes

In 2020, there were 10,921 new cases of breast cancer diagnosed in women aged 50–74, a crude rate of 306.7 per 100,000 women (Table A7.2). Over the same period there were 1,667 new cases of DCIS in women aged 50–74, or 46.8 per 100,000 women (Table A7.11).

In 2022, there were 1,404 deaths from breast cancer for women aged 50–74 in Australia, a crude rate of 38.4 per 100,000 women (Table A8.2).

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



PI 4: 5,881 participants aged 50–74 diagnosed with breast cancer (61.3 per 10,000) (2022)
3,386 participants aged 50–74 diagnosed with small cancers (≤15 mm) (35.3 per 10,000)
57.6% of all cancers diagnosed in participants aged 50–74 were small cancers (≤15 mm)

PI 5: 1,482 participants aged 50–74 diagnosed with DCIS (15.5 per 10,000) (2022)

PI 6a: Interval cancer rate was 9.0 per 10,000 in participants aged 50–74 (2017–2019)

PI 6b: Program sensitivity was 77.6% in participants aged 50–74 (2017–2019)

Outcomes

PI 7a: Breast cancer incidence 306.7 per 100,000 (2020)

PI 7b: DCIS incidence 46.8 per 100,000 (2020)

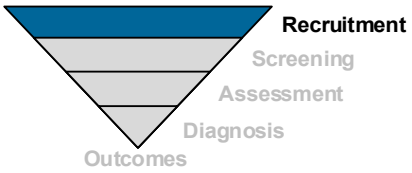
PI 8: Mortality 38.4 per 100,000 (2022)

PI = performance indicator.

Notes

1. Participation PI 1 is reported for the 2-year calendar period 2021–2022. Rescreening PI 2 is reported for the index year 2020. Recall to assessment PI 3, invasive breast cancer detection PI 4 and DCIS detection PI 5 are reported for 2022. Interval cancer PI 6a and program sensitivity PI 6b are reported for the index years 2017, 2018 and 2019. Breast cancer incidence PI 7a and DCIS incidence PI 7b are reported for 2020. Mortality PI 8 is reported for 2022.
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 2020; AIHW National Mortality Database.



Recruitment

Performance indicator 1: Participation

Summary

- 1,820,994 participants aged 50–74 were screened through BreastScreen Australia in 2021–2022, equivalent to a crude participation rate of 50.1%.
- 1,901,123 participants aged 50–74 were screened through BreastScreen Australia in 2022–2023, equivalent to a crude participation rate of 51.7% (preliminary data).
- Participation remained steady between 53% and 54% (age-standardised) for participants aged 50–74 between 2014–2015 and 2018–2019. Due to the impact of the COVID-19 pandemic from March 2020 participation decreased to 47% in 2020–2021 and has since increased to 50% in 2021–2022 and 51% in 2022–2023.

Definition

The percentage of females in the population 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 aged 50–74. High attendance for screening 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 participants 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 participants screened, not the number of screening mammograms performed.

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

Participation data are reported as a percentage of females in the population.

The most recent final participation data are for participants who had a screening mammogram in the years 2021 and 2022, with preliminary data for participants who had a screening mammogram in the years 2022 and 2023.

A higher participation rate is better.

Results

Summary data and trends are shown for both final participation for 2021–2022 and preliminary participation for 2022–2023.

Final participation 2021–2022

In 2021–2022, a total of 2,078,620 participants were screened through BreastScreen Australia, of whom, 1,820,994 (87.6%) were aged 50–74. This is equivalent to a participation rate of 50.1% for those aged 50–74 (Table A1.1).

Preliminary participation 2022–2023

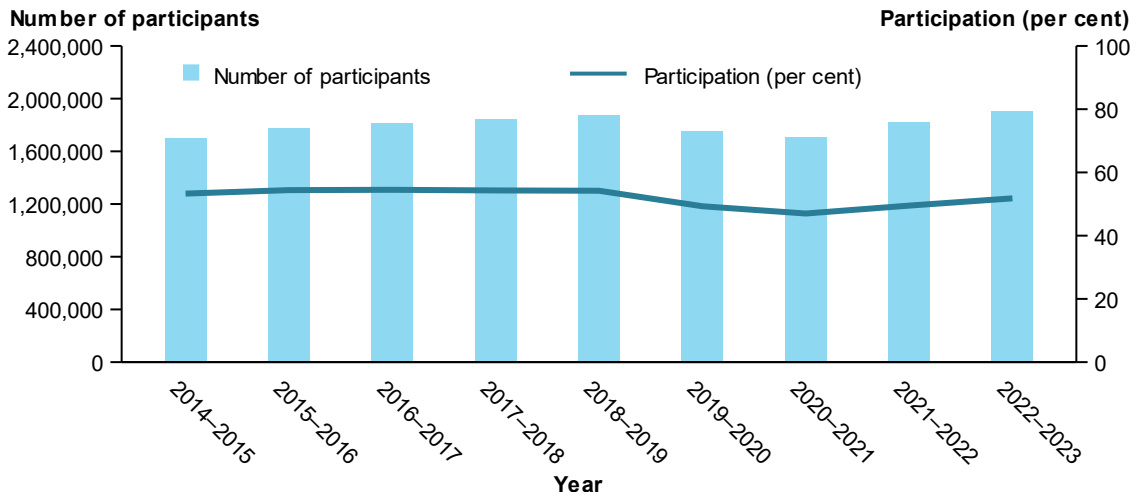
Preliminary participation data are for 2022–2023 are reported ahead of the reporting in full of final participation data for 2022–2023 in the BreastScreen Australia monitoring report 2025.

In 2022–2023, a total of 2,214,000 participants were screened through BreastScreen Australia, of whom, 1,901,123 (85.9%) were aged 50–74. This is equivalent to a participation rate of 51.7% for the target age group 50–74 (Table A1.11)

Participation trends

The participation rate among the target age group 50–74 remained stable over time prior to 2020. The age-standardised participation rate remained between 53% and 54% from 2014–2015 to 2018–2019 and decreased to 49.3% and 47.0% in 2019–2020 and 2020–2021, respectively, due to the impact of the COVID-19 pandemic. Participation increased to 49.5% in 2021–2022, and increased again to 51.2% in 2022–2023 (Figure 3.1.1).

Figure 3.1.1: Participation in BreastScreen Australia, participants aged 50–74, 2014–2015 to 2022–2023



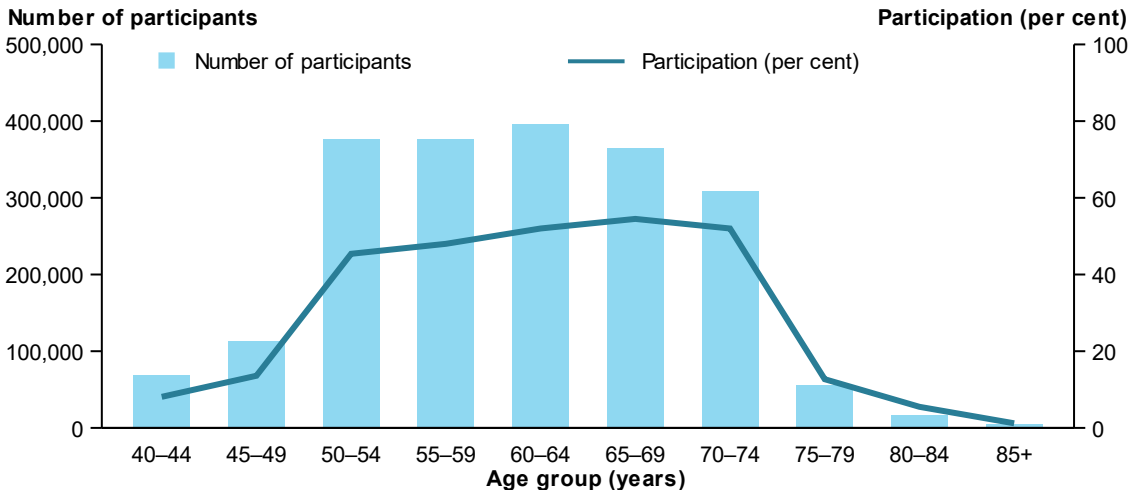
Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A1.1.

The following data are shown for final participation for 2021–2022 only.

Participation by age

In 2021–2022, of the women aged 40 and over who were screened through 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 3.1.2). Furthermore, the proportion screened in all 5-year age groups within the target age group was equal to or above 45.4%, peaking at 54.5% in participants aged 65–69. The participation rates outside the target age group were lower, at 10.8% for participants aged 40–49 and 7.1% for participants aged 75 and over.

Figure 3.1.2: Participation in BreastScreen Australia by age group, 2021–2022



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A1.2.

With the addition of ages 70–74 to the target age group, the number of participants screening aged 70–74 increased substantially, from 97,957 in 2011–2012 (the last reporting period for which the target age group was 50–69) to 308,032 in 2021–2022. This equated to a rise in the participation rate of those aged 70–74, from 25.9% in 2011–2012 to 52.0% in 2021–2022 (Figure 3.1.3). At 52.0%, the participation rate for ages 70–74 is now higher than the participation rates for ages 50–59.

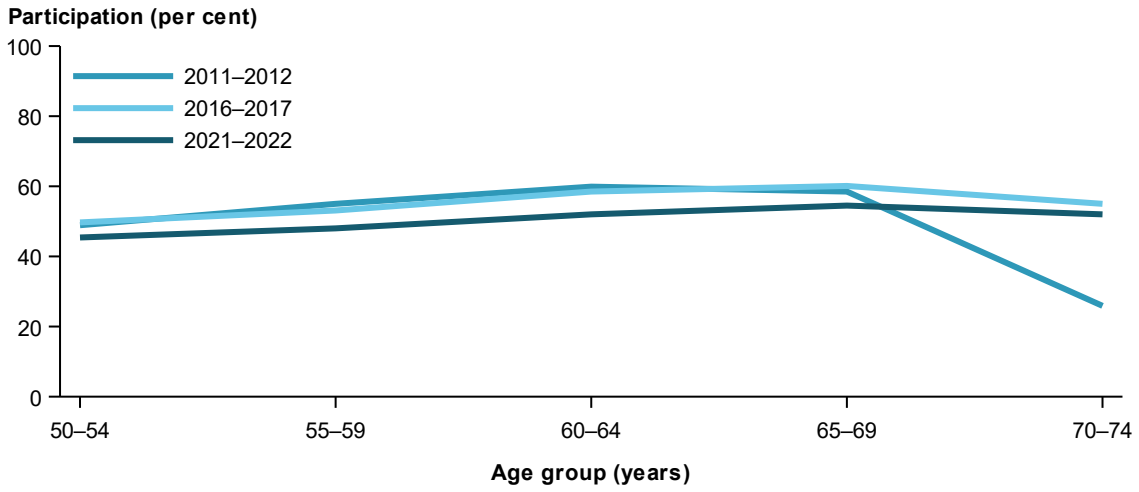
Participation by state and territory

In 2021–2022, the age-standardised participation rate for the target age group 50–74 varied between the states and territories from 34.1% to 57.9% (Table A1.4).

Participation by main language spoken at home

In 2021–2022, the age-standardised participation rate for the target age group 50–74 was 38.4% for those who spoke a language other than English at home compared with 52.3% for those who spoke English at home (Table A1.7).

Figure 3.1.3: Participation trends for participants aged 50–74, 2011–2012, 2016–2017 and 2021–2022



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

Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A1.3.

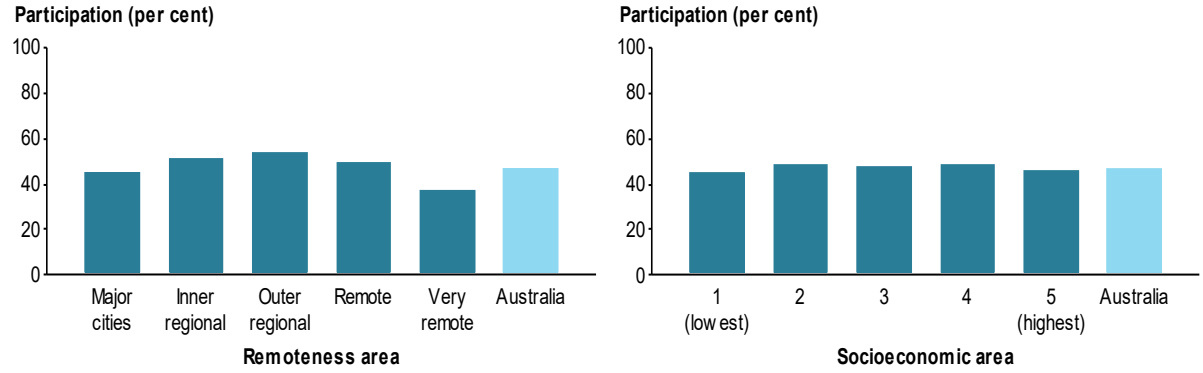
Participation by remoteness area

In 2021–2022, the age-standardised participation rates for the target age group 50–74 were highest in *Outer regional* and *Inner regional* areas at 53.6% and 52.3%, respectively, followed by participants living in Major cities and *Remote areas* at 48.3% and 47.5%, respectively (Figure 3.1.4). The participation rate was lowest for participants living in *Very remote* areas at 38.6%.

Participation by socioeconomic area

In 2021–2022, there was little variation in participation for the target age group 50–74 across socioeconomic areas, with all areas having an age-standardised participation rate between 47.0% and 50.8% (Figure 3.1.4).

Figure 3.1.4: Participation in BreastScreen Australia, participants aged 50–74, by remoteness area, and by socioeconomic area, 2021–2022



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in tables A1.5 and A1.6.

Data by month are shown for both final participation for 2021–2022 and preliminary participation for 2022–2023.

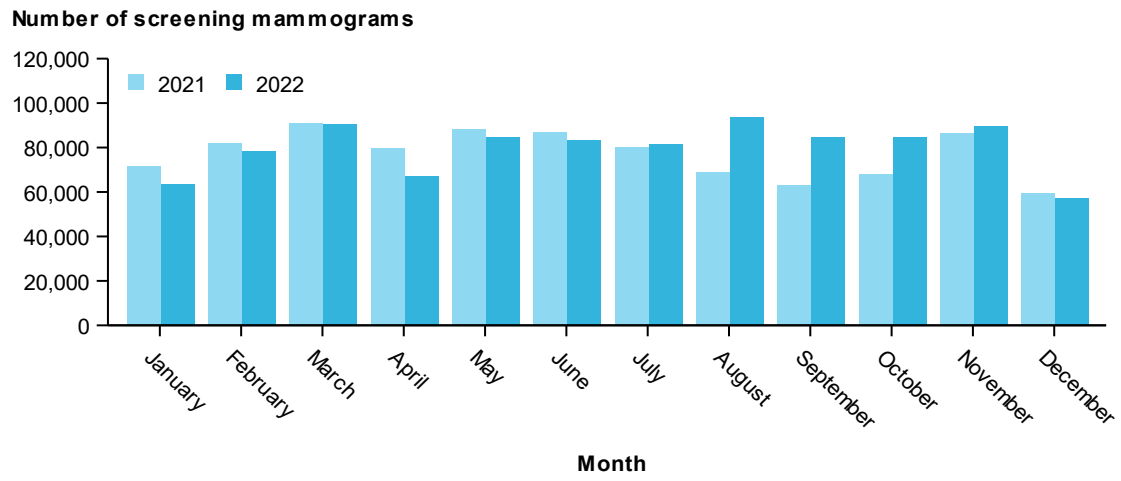
Participation by month

The number of screening mammograms performed through BreastScreen Australia each month in 2021, 2022 and 2023 is shown in Figure 3.1.5 and Figure 3.1.6.

In 2021 the number of screening mammograms performed recovered progressively to pre-COVID-19 levels until June 2021 but fell again during the second half of 2021 coinciding with further COVID-19 restrictions (Figure 3.1.5).

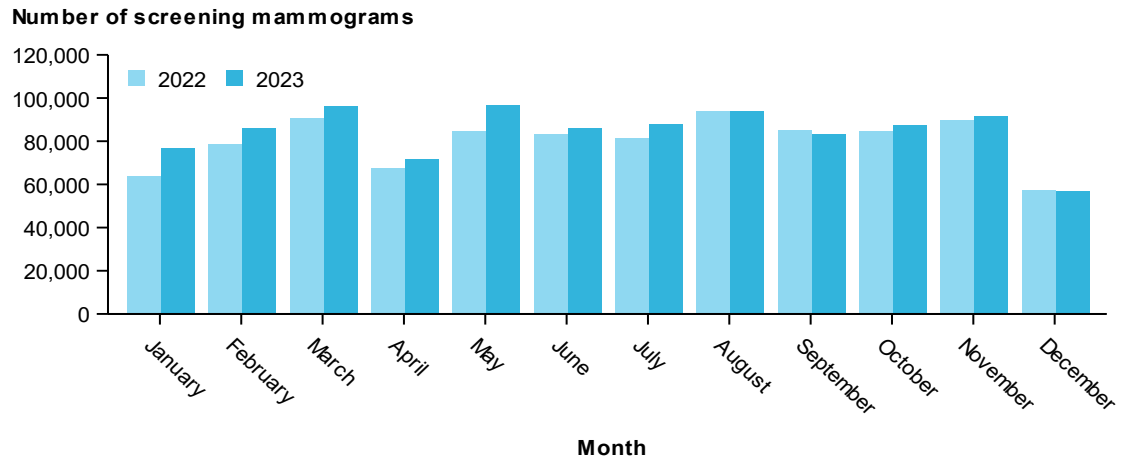
The number of screening mammograms performed in 2023 was notably higher than the number of screening mammograms performed in 2022 for the months January to May (Figure 3.1.6).

Figure 3.1.5: Number of screening mammograms performed through BreastScreen Australia, by month, participants aged 50–74, 2021 and 2022



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A1.8.

Figure 3.1.6: Number of screening mammograms performed through BreastScreen Australia, by month, participants aged 50–74, 2022 and 2023



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A1.9.

BreastScreen Australia and National Accreditation Standards (NAS) Measures

Box 3.1.1: BreastScreen Australia and National Accreditation Standards

The provision of a high-quality service 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 reported against these Measures. This is 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 Aboriginal and Torres Strait Islander women and women from 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.

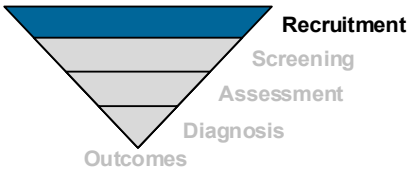
Table 3.1.1 shows the NAS Measures related to participation. While NAS Measures for women aged 50–74 do not yet have a target, BreastScreen Australia aims to maximise the participation of women in the target age groups for screening.

Table 3.1.1: NAS Measures for participation calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2024*

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.	50.1%
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	36.8%
	Non-English-speaking	38.9%
	Remote/Very remote	47.9%/38.7%
	SES group (lowest)	47.8%
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	10.8%
	75+	7.1%

Note: Crude rate is the number of participants screened in 2021–2022, as a percentage of the ABS estimated resident population.

Source: AIHW analysis of BreastScreen Australia data.



Performance indicator 2: Rescreening

Summary

- The proportion of participants aged 50–72 who screened in 2020 and rescreened within 27 months was 50.9% after the first screening round, 59.5% after the second screening round, and 76.0% after the third and subsequent screening rounds.
- In 2020, regardless of the screening round, the highest rescreen rates were for participants aged 50–72, followed by participants aged 40–49. Participants aged 75 and over had the lowest rescreen rate.

Definition

The proportion of participants 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, the age group 50–72 is used to calculate the rescreen rate because participants 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.

Rescreening data are reported as a percentage of participants screened.

The most recent rescreening data are for participants screened in the index year 2020. This small lag in data availability is due to the fact that 27 months needs to have passed since a participant's last screen to know whether or not they have rescreened within this interval.

A higher rescreening rate is better.

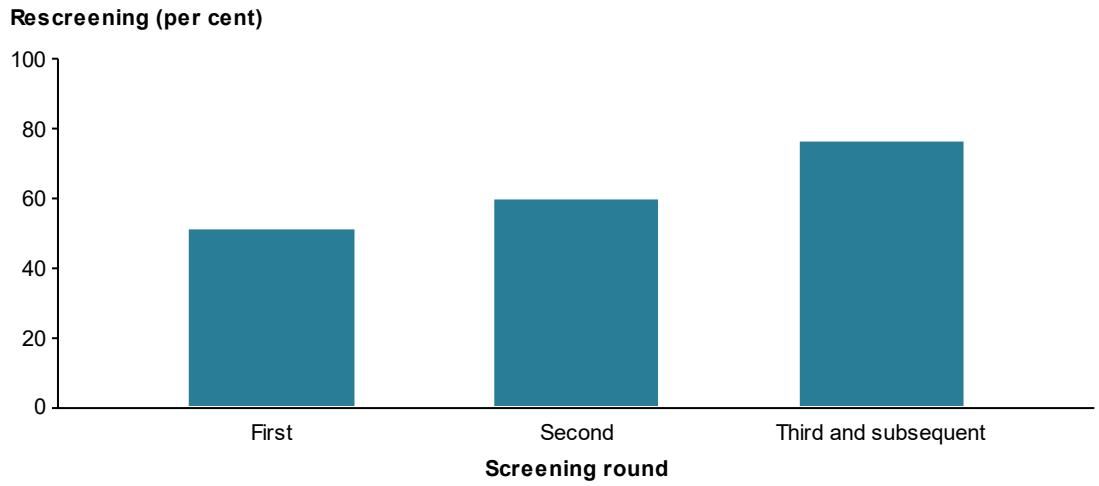
More information on rescreening

The rescreening indicator measures the proportion of participants 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 participants aged 50–72 who screened in 2020 and rescreened within 27 months was 50.9% after the first screening round (that is, a participant's first screen with BreastScreen Australia), 59.5% after the second screening round, and 76.0% after the third and subsequent screening rounds (Figure 3.2.1). This indicates that the proportion of participants aged 50–72 who return for a rescreen within 27 months increases with the number of screens previously attended.

Figure 3.2.1: Rescreening by screening round, participants aged 50–72 screened during 2020



Note: Crude rates are the number of participants rescreening within 27 months as a percentage of participants screened.

Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A2.3.

Rescreening trends

Between 2014 and 2020 rescreening for participants aged 50–72 for the first screening round varied between 41.1% and 60.9% (Table A2.1). Over the same period the rescreening rate for the second screening round varied between 46.6% and 70.1%. The rescreen rate for the third and subsequent screening rounds ranged between 65.1% and 85.0%.

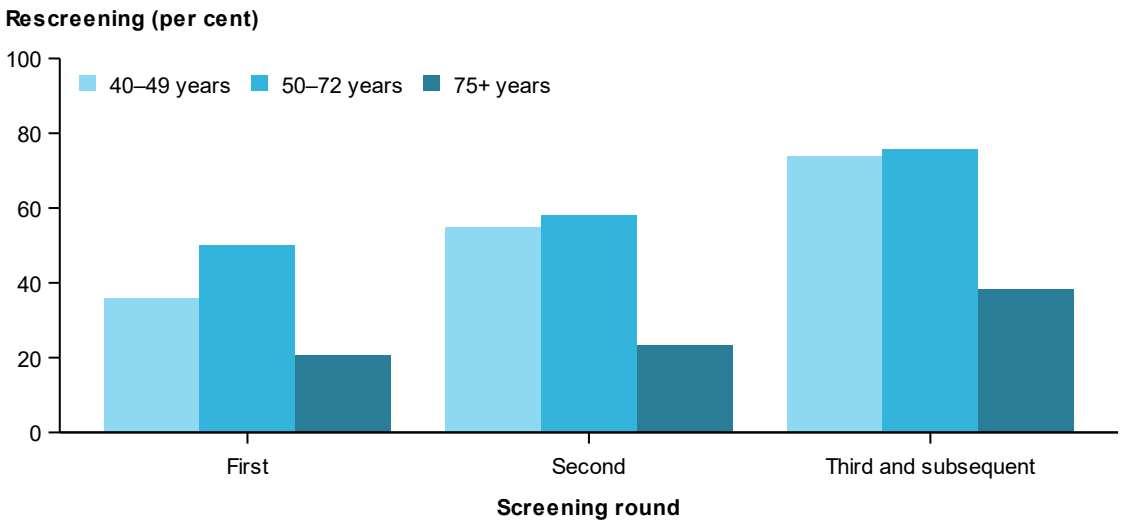
Rescreening by age

In 2020, regardless of the screening round, the highest rescreen rate was for participants aged 50–72, followed by participants aged 40–49 (Figure 3.2.2). Participants aged 75 and over had the lowest rescreen rate.

Rescreening by state and territory

In 2020, rescreen rates varied between the states and territories. For participants aged 50–72 rescreen rates for the first screening round varied between 33.7% and 63.6%. Over the same period the rescreening rate for the second screening round varied between 40.8% and 66.2%. The rescreen rate for the third and subsequent screening rounds ranged between 67.0% and 82.0% (Table A2.3).

Figure 3.2.2: Rescreening by screening round, participants aged 40–49, 50–72 and 75+, screened in 2020



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

Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A2.2.

National Accreditation Standard (NAS) Measures related to rescreening

Table 3.2.1 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 3.1.1 for information on the National Accreditation Standards.

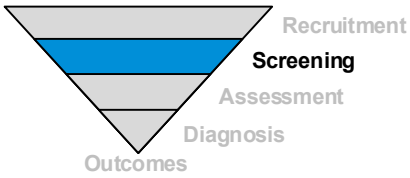
Table 3.2.1: NAS Measures for rescreening calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2024*

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.	50.9% 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.	59.5% second 76.0% subsequent

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

AIHW analysis of BreastScreen Australia data.

Screening



Performance indicator 3: Recall to assessment

Summary

In 2022, the crude recall to assessment rate for participants aged 50–74 was 11.0% for the first screening round and 3.9% for subsequent screening rounds.

Definition

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

Rationale

Participants 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 participant is more likely to be recalled to assessment the first time they visit a BreastScreen service than at subsequent visits. This is for 2 reasons: first, a participant is more likely to have an invasive breast cancer detected on their first visit and, second, with no previous images against which to compare the images from their 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.

Recall to assessment data are reported as a percentage of participants screened.

The most recent recall to assessment data are for participants screened in 2022.

More information on recall to assessment

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

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

Results

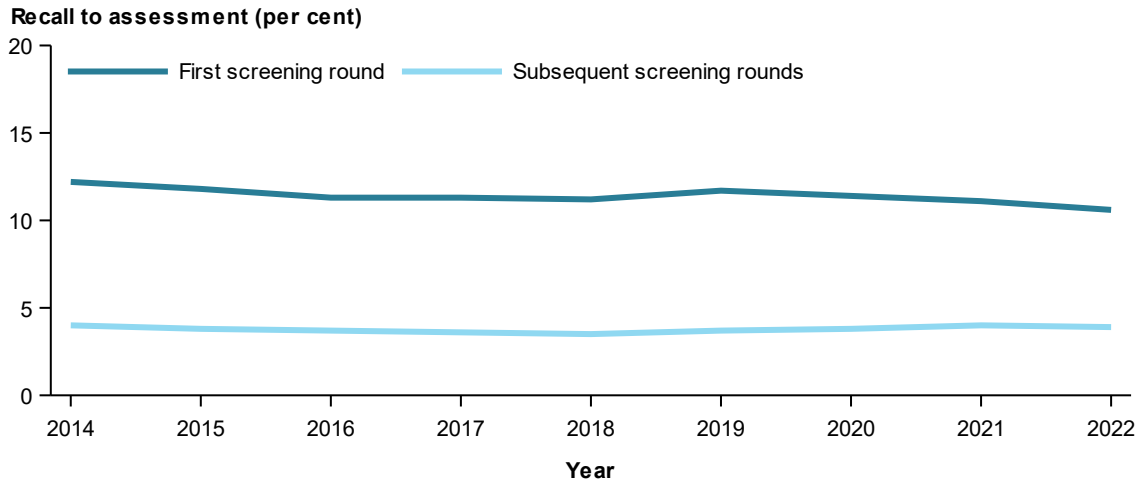
In 2022, of the 90,227 participants aged 50–74 who attended their first screening round, 9,880 were recalled to assessment, which equates to a crude rate of 11.0 (Table A3.1).

Of the 868,437 participants aged 50–74 who attended subsequent screening rounds, 33,704 were recalled to assessment, which equates to a crude rate of 3.9%.

Recall to assessment trends

Between 2014 and 2022 the recall to assessment rate for participants aged 50–74 for the first screening round varied between 10.6% and 12.2%. Over the same period, the recall to assessment rate for subsequent screening rounds ranged between 3.5% and 4.0% (Figure 3.3.1).

Figure 3.3.1: Recall to assessment, participants aged 50–74, first and subsequent screening rounds, 2014 to 2022



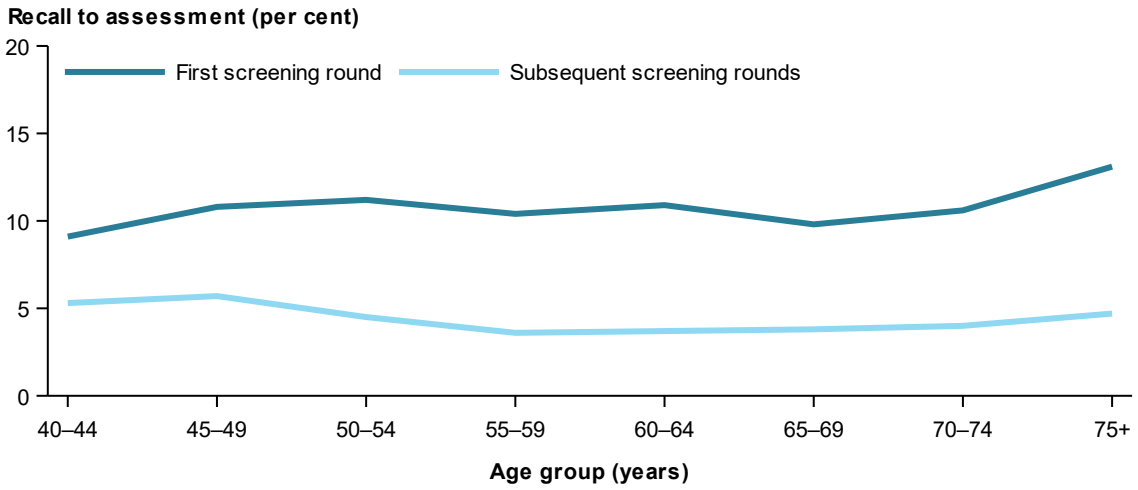
Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A3.1.

Recall assessment by age

In 2022, the proportion of participants attending their first screen who were recalled to assessment for further investigation was lowest for participants aged 40–44 at 9.1% and highest for participants 75 and over at 13.1% (Figure 3.3.2).

This pattern differed for participants attending subsequent screens; the proportion recalled to assessment was highest for participants aged 40–44 and 45–49 at 5.3% and 5.7%, followed by participants aged 50–54 and 75 and over at 4.5% and 4.7%. Participants aged 55–74 were least likely to be recalled after a subsequent screen, with recall rates ranging between 3.6% and 4.0% (Figure 3.3.2).

Figure 3.3.2: Recall to assessment, by age group, first and subsequent screening rounds, 2022



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

Recall assessment by state and territory

In 2022, the recall to assessment rates for participants aged 50–74 attending their first screen varied across the states and territories, from 8.8% to 14.4% (Table A3.3). The corresponding rates for participants aged 50–74 attending subsequent screens varied from 3.4% to 6.3%.

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

Table 3.3.1 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).

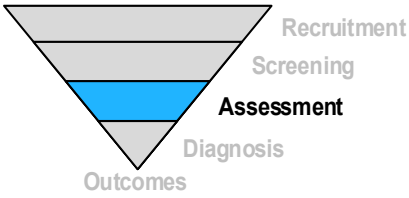
See Box 3.1.1 for information on the National Accreditation Standards.

Table 3.3.1: NAS Measures for recall to assessment calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2024*

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	5.7% to 9.9%
	75+	4.7% to 13.1%
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.	11.0%
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.	3.9%

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

Source: AIHW analysis of BreastScreen Australia data.



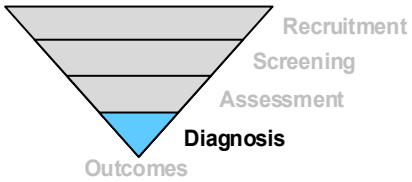
Assessment

There are no performance indicators to report for assessment.

The majority of participants who participate in BreastScreen Australia experience only the screening test, as nothing suspicious is seen on the screening mammogram. However, a subset of participants are recalled for further investigation.

Assessment can include:

- 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 core biopsy of breast tissue for histological assessment or fine needle aspiration for cytological assessment.



Diagnosis

Performance indicator 4: Invasive breast cancer detection

Summary

- In 2022, 931 participants aged 50–74 had an invasive breast cancer detected at their first screening round through BreastScreen Australia, equivalent to 103.2 participants with an invasive breast cancer detected per 10,000 participants screened.
- In 2022, 4,950 participants aged 50–74 had an invasive breast cancer detected at a subsequent screening round through BreastScreen Australia, equivalent to 57.0 participants with an invasive breast cancer detected per 10,000 participants screened.
- In 2022, 3,386 participants aged 50–74 had a small (≤15 mm) invasive breast cancer detected through BreastScreen Australia.
- 57.6% of all invasive breast cancers in participants aged 50–74 were small (≤15 mm).

Definition

The number of participants aged 50–74 with invasive breast cancer detected through BreastScreen Australia per 10,000 participants 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 participant is more likely to have a breast cancer detected the first time they visit a BreastScreen service than in subsequent visits. This is because a participant'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.

Invasive breast cancer detection data are reported per 10,000 participants screened.

The most recent breast cancer detection data are for participants screened in 2022.

Results

In 2022, 5,881 participants aged 50–74 had an invasive breast cancer detected through BreastScreen Australia. Of these, 931 were attending their first screen (equivalent to 103.2 participants diagnosed per 10,000 participants screened), and 4,950 were attending a

subsequent screen (equivalent to 57.0 participants diagnosed per 10,000 participants screened) (Table A4.5).

In 2022, of the 5,881 participants aged 50–74 who had an invasive breast cancer detected through BreastScreen Australia, 3,386 had a small (≤15 mm) cancer detected. This equates to 35.3 per 10,000 participants screened (Table A4.6).

In 2022, 57.6%, of all invasive breast cancers detected in participants aged 50–74 were small (≤15 mm) (Table A4.4).

Invasive breast cancer detection summary

The majority of participants who participate in BreastScreen Australia experience only the screening test. In 2022, of the 90,227 participants aged 50–74 who screened for the first time, 9,880 (11.0%) were recalled for further assessment. Of the 868,437 participants attending subsequent screens, 33,704 (3.9%) were recalled (Table 3.4.1).

Most of the participants recalled to assessment did not have an invasive breast cancer detected. Of the 9,880 participants recalled to assessment after a first screen, 931 (9.4%) had an invasive breast cancer detected; of the 33,704 participants recalled to assessment after a subsequent screen, 4,950 (14.7%) had an invasive breast cancer detected (Table 3.4.1).

This means that in 2022, of the 90,227 participants aged 50–74 screened for the first time, 1.0% had an invasive breast cancer detected, and of the 868,437 participants attending subsequent screens, 0.6% had an invasive breast cancer detected through BreastScreen Australia (Table 3.4.1).

Table 3.4.1: Number of participants aged 50–74 who had an invasive breast cancer detected, first and subsequent screening rounds, 2022

	Number	% of participants screened	% of participants recalled to assessment
Screened			
First screening round	90,227	. .	. .
Subsequent screening rounds	868,437	. .	. .
Recalled to assessment			
First screening round	9.880	11.0	. .
Subsequent screening rounds	33,704	3.9	. .
Invasive breast cancer detected			
First screening round	931	1.0	9.4
Subsequent screening rounds	4,950	0.6	14.7

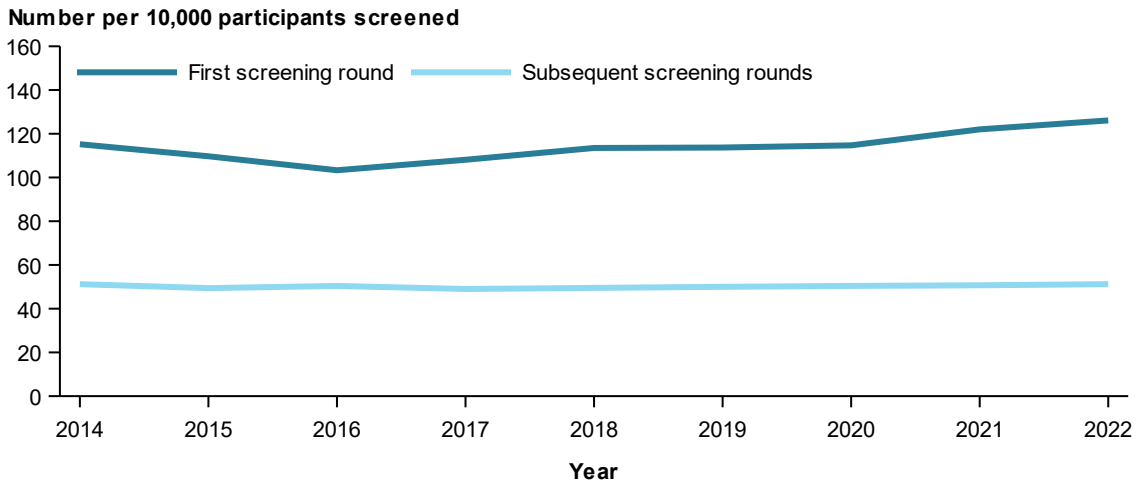
Source: AIHW analysis of BreastScreen Australia data.

Invasive breast cancer detection trends

Between 2014 and 2022, the age-standardised invasive breast cancer detection rate for participants aged 50–74 for their first screening round ranged between 103.3 and 126.1 participants with an invasive breast cancer detected per 10,000 participants screened (Figure 3.4.1).

Over the same period, the equivalent rate for subsequent screening rounds for participants aged 50–74 was more stable and ranged between 49.0 and 51.2 participants with an invasive breast cancer detected per 10,000 participants screened (Figure 3.4.1).

Figure 3.4.1: Invasive breast cancer detection (all sizes), participants aged 50–74, first and subsequent screening rounds, 2014 to 2022



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A4.1.

Small cancers

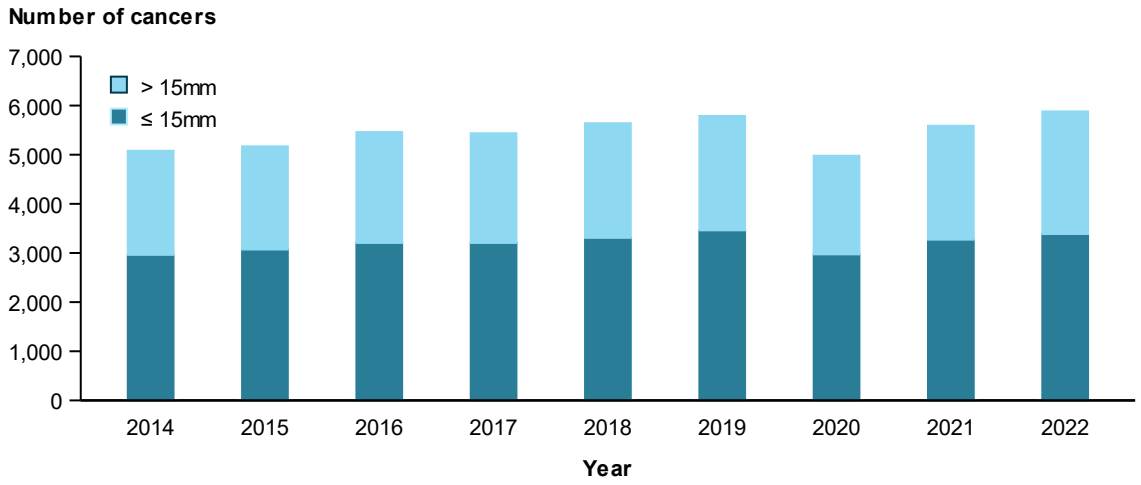
In 2022, for every 10,000 participants aged 50–74 screened through BreastScreen Australia, 35.3 had a small (≤15 mm) invasive breast cancer detected (Table A4.6). As a proportion of all invasive breast cancers detected through BreastScreen Australia in participants aged 50–74, 43.9% were small in participants attending their first screen and 60.1% in participants attending subsequent screens. For all screening rounds combined, 57.6% of all breast cancers detected were small.

A participant is more likely to be diagnosed with a small cancer in subsequent screening visits than at their first visit, since their 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.

Between 2014 and 2022 the proportion of small breast cancers detected for participants aged 50–74 varied between 57.6% and 59.8% (Figure 3.4.2). Of note, more than half of all invasive breast cancers detected through BreastScreen Australia are small. 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 2022, the proportion of invasive breast cancers that were small was lower in younger age groups, comprising 44.4% of cancers detected for participants aged 40–49, compared with 56.6% for participants aged 75 and over and 57.6% for participants aged 50–74 (Table A4.3). 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; Cancer in Australia 2015b).

Figure 3.4.2: Number of invasive breast cancers, showing the proportion of small (≤15 mm) to other sizes (>15 mm), detected in participants aged 50–74, all screening rounds, 2014 to 2022



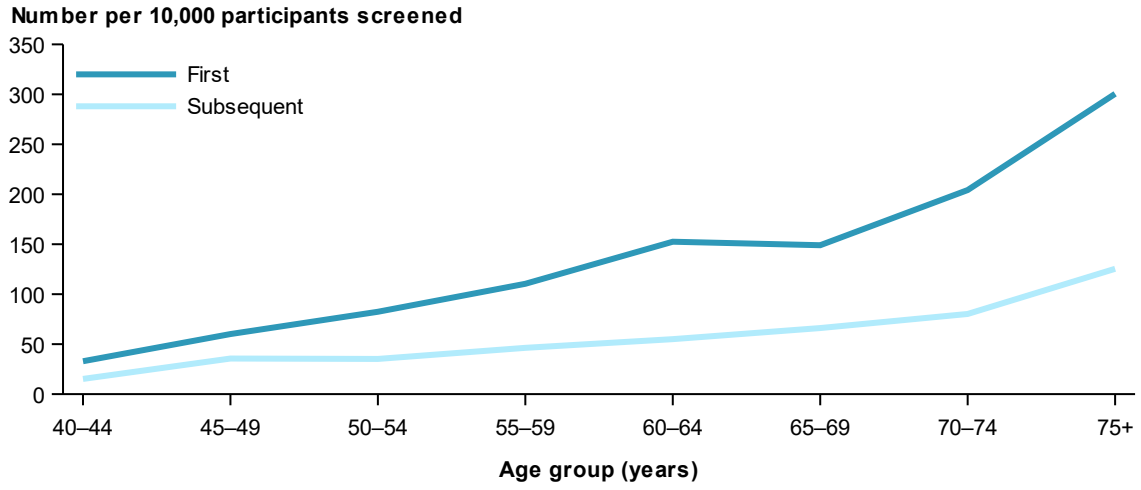
Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A4.4

Invasive breast cancer detection by age

In 2022, breast cancer detection rates increased with age. For the subsequent rounds the increase was from 15 per 10,000 participants screened for those aged 40–44, to 80 per 10,000 participants screened for those aged 70–74 (Figure 3.4.3). Breast cancer detection rates were highest for participants aged 75 and over, with 125 participants with invasive breast cancer detected through BreastScreen Australia for every 10,000 participants screened.

Over the same period the cancer detection rates for the first screening round increased to 204 per 10,000 participants screened for participants 70–74 and to 300 per 10,000 participants screened for participants aged 75 and over (Figure 3.4.3).

Figure 3.4.3: Invasive breast cancer detection by age group and screening rounds, 2022



Source: AIHW analysis of BreastScreen Australia data.

Invasive breast cancer detection by state and territory

In 2022, the breast cancer detection rate for participants aged 50–74 varied across states and territories for participants attending both their first screening round and subsequent screening rounds (Table A4.5).

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

Table 3.4.2 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 3.1.1 for information on the National Accreditation Standards.

Table 3.4.2: NAS Measures for invasive breast cancer detection calculated using BreastScreen Australia data supplied for the *BreastScreen Australia report 2024*

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.	103.2
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.	57.0
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.	45.3
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.	34.3

Note: Crude rate is the number of participants with invasive breast cancer detected per 10,000 participants screened.

Source: AIHW analysis of BreastScreen Australia data.

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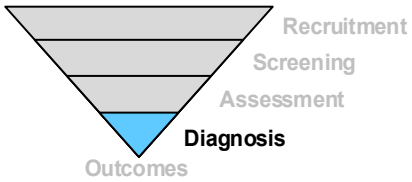


Performance indicator 5: Ductal carcinoma in situ (DCIS) detection

Summary

- 1,744 participants had DCIS detected through BreastScreen Australia in 2022, of whom 1,482 (85.0%) were aged 50–74.
- In 2022, the DCIS detection rate for participants aged 50–74 was higher in the first screening round at 25.9 per 10,000 participants screened than in subsequent screening rounds at 14.4 per 10,000 participants screened.

Definition

The number of participants aged 50–74 with DCIS detected through BreastScreen Australia per 10,000 participants 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, BreastScreen Australia aims to maximise the detection of DCIS, as for invasive breast cancer (BreastScreen Australia 2022).

Guide to interpretation

DCIS is disaggregated into first and subsequent screening rounds because a participant is more likely to have DCIS diagnosed at their first screen than subsequent screens, since their 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.

DCIS detection data are reported per 10,000 participants screened.

The most recent DCIS data are for participants screened in 2022.

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 invasive 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.

Results

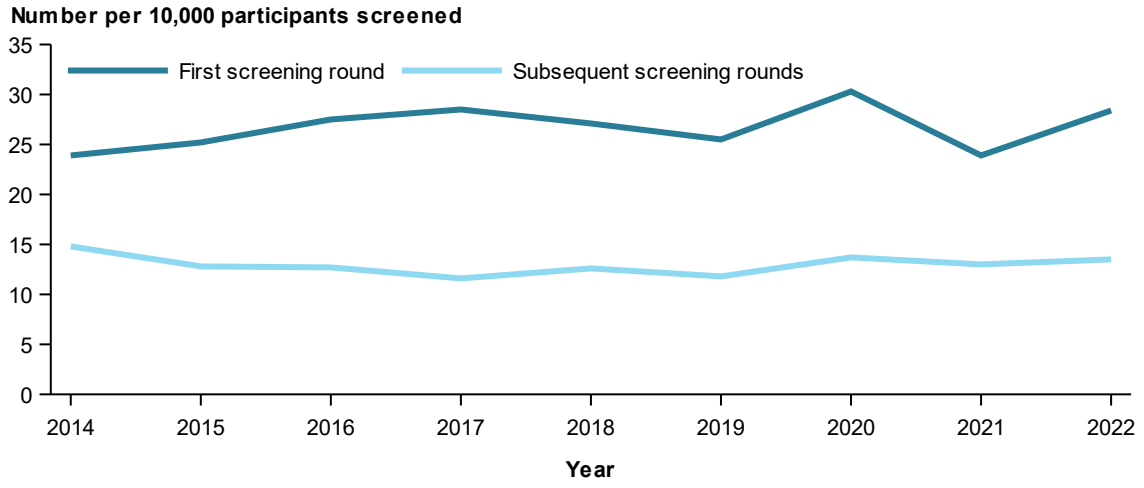
In 2022, 1,482 participants aged 50–74 had DCIS detected through BreastScreen Australia. Of these, 234 were attending their first screen, equivalent to 25.9 participants diagnosed per 10,000 participants screened and 1,248 were attending a subsequent screen, equivalent to 14.4 participants diagnosed per 10,000 (Table A5.1).

DCIS detection trends

Between 2014 and 2022, the age-standardised DCIS detection rate for participants aged 50–74 for their first screening round varied between 23.9 and 30.3 participants with DCIS detected per 10,000 participants screened (Figure 3.5.1).

Over the same period the age-standardised DCIS detection rate for participants aged 50–74 for subsequent screening rounds varied between 11.6 and 14.8 per 10,000 participants screened (Figure 3.5.1).

Figure 3.5.1: DCIS detection, participants aged 50–74, first and subsequent screening rounds, 2014 to 2022



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table A5.1.

DCIS detection by age

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

In 2022, the DCIS detection rate for all screening rounds per 10,000 participants screened was 14.9 participants with DCIS detected through BreastScreen Australia for those aged 40–49, increasing to 25.4 for those aged 75 and over (Table A5.2).

DCIS detection by state and territory

In 2022, the DCIS age-standardised detection rate for participants aged 50–74 for all screening rounds varied between the states and territories, from 11.9 to 19.5 per 10,000 participants screened (Table A5.3).

National Accreditation Standard (NAS) Measures related to DCIS detection

Table 3.5.1 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.

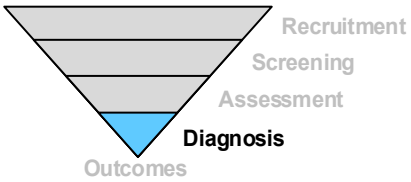
See Box 3.1.1 for information on the National Accreditation Standards.

Table 3.5.1: NAS Measures for DCIS detection calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2024*

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.	25.9
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.	14.4

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

Source: AIHW analysis of BreastScreen Australia data.



Performance indicator 6a: Interval cancers

Summary

For the index years 2017, 2018 and 2019, for participants aged 50–74, the interval cancer rates for both first and subsequent screening rounds were higher in the second year (13–24 months) after a negative screening episode than in the first year (0–12 months).

Definition

The number of invasive breast cancers detected in participants aged 50–74 screened through BreastScreen Australia that arise during an interval between 2 screening rounds, per 10,000 participants.

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:

(a) invasive breast cancers detected at a screening episode

(b) invasive breast cancers diagnosed 0–12 months after a screening episode detected no cancer

(c) 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.

Interval cancer data are reported per 10,000 participants screened.

The latest data for interval cancers are for participants screened in 2017, 2018 and 2019 (referred to as index years 2017–2019). These are the latest data available because at least 2 years need to have passed since a participant's last routine screening mammogram in order to know whether they were diagnosed with an interval cancer in that time—though this time period is often longer than 2 years 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.

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 participants, the next screening episode will occur around 24 months after

their previous negative screening episode, as the recommended screening interval for most participants in BreastScreen Australia is 24 months. The exception to this is participants on annual screens, for whom the next screening episode will occur around 12 months after their previous negative screening episode.

An interval cancer may be:

(a) an aggressive breast cancer that emerges and grows very rapidly in the period between screening episodes
(b) 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
(c) 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 2019).

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 3.6.1: 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

For the index years 2017–2019, for participants aged 50–74, 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 (Tables A6.1 and A6.2).

For the index years 2017–2019, for participants aged 50–74, in the 0–12 months after a participant's first negative screening episode, there were 7.2 interval cancers per 10,000 participants. In the 0–12 months after a subsequent screening episode, there were 6.4 interval cancers per 10,000 participants (Table 3.6.1).

For participants aged 50–74, in the 13–24 months after a participant's first negative screening episode, there were 10.8 interval cancers per 10,000 participants. In the 13–24 months after a subsequent screening episode, there were 11.9 interval cancers per 10,000 participants (Table 3.6.1).

For the index years 2017–2019, 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 likelihood of participants being diagnosed with an 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 3.6.1).

Table 3.6.1: Interval cancer rate, by time since screen, participants aged 50–74 screened in 2017–2019

	Time since screen		
	0–12 months	13–24 months	0–24 months
First screening round			
Number	186	269	455
Crude rate	7.2	10.8	9.0
AS rate	7.9	11.3	9.6
95% CI	6.6–9.4	9.6–13.0	8.5–10.7
Subsequent screening rounds			
Number	1,626	2,799	4,425
Crude rate	6.4	11.9	9.0
AS rate	6.3	11.6	8.8
95% CI	6.0–6.6	11.1–12.0	8.6–9.1

Notes

1. Crude rate is the number of interval cancers detected per 10,000 person-years; age-standardised (AS) rate is the number of interval cancers detected per 10,000 person-years, age-standardised to the population of participants attending a BreastScreen Australia service in 2008; 95% CI are 95% confidence intervals.
2. For confidence intervals, see Box A6.1.

Source: AIHW analysis of BreastScreen Australia data.

Interval cancers by age

For the index years 2017–2019, in the 0–12 months after a negative screening episode, the interval cancer rates for all screening rounds were lower for participants aged 50–74, and higher for participants outside these age groups (Table 3.6.2). In the 13–24 months after a negative screening round, the interval cancer rates were lower for participants aged 40–49 and 50–59, and higher for participants outside these age groups.

Table 3.6.2: Interval cancer rate, all screening rounds, by age group, participants screened in 2017–2019

	Time since screen			
	0–12 months		13–24 months	
Age group (years)	Number	Crude rate	Number	Crude rate
40–49	298	8.3	357	11.3
50–59	769	6.3	1,189	10.6
60–69	755	6.5	1,360	12.5
70–74	288	6.7	519	13.0
75+	99	10.0	140	15.2

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

Source: AIHW analysis of BreastScreen Australia data.

Interval cancers by state and territory

For the index years 2017–2019, in the 0–24 months after a negative screening episode, the interval cancer rate for participants aged 50–74 varied across states and territories, from 7.9 to 9.6 per 10,000 participants (for all screening rounds) (Table A6.4).

See Box 3.6.1 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 3.6.3 shows the NAS Measures related to interval cancers for women aged 50–74. BreastScreen Australia aims to minimise the number of cancers that are missed (false negatives).

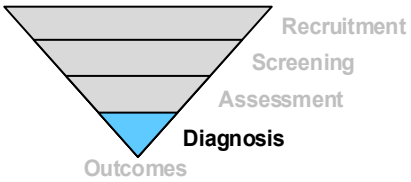
See Box 3.1.1 for information on the National Accreditation Standards.

Table 3.6.3: NAS Measures for interval cancers calculated using BreastScreen Australia data supplied for the *BreastScreen Australia monitoring report 2024*

NAS Measure		Value (crude rate)
NAS Measure 2.3.1(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for screening who are diagnosed with an interval invasive breast cancer in the first calendar year following a negative screening episode.	7.2 first screen 6.4 subsequent screens
NAS Measure 2.3.2(a)	The Service and/or SCU monitors and reports the proportion of women aged 50–74 years who attend for screening who diagnosed with an interval invasive breast cancer in the second calendar year following a negative screening episode.	10.8 first screen 11.9 subsequent screens

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

Source: AIHW analysis of BreastScreen Australia data.



Performance indicator 6b: Program sensitivity

Summary

- For the index years 2017, 2018 and 2019, program sensitivity for participants aged 50–74 differs by screening round, being higher after a participant's first screen than after subsequent screens.
- Program sensitivity over the same period for both 0–12 months and 0–24 months (for all screening rounds) was lowest for participants 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 participants aged 50–74 in the screening interval (2 years).

Rationale

High program sensitivity indicates that few cancers in screened participants 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 program 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 is reported by 10-year age groups and aggregated over 3 years.

Program sensitivity data are reported as a percentage of all cancers.

The latest program sensitivity data are for participants aged 50–74 screened in 2017, 2018 and 2019 (referred to as index years 2017–2019). These are the latest data available because at least 2 years need to have passed since a participant's last routine screening mammogram in order to know whether they were diagnosed with an interval cancer in that time—though this time period is often longer than 2 years 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.

Results

For participants aged 50–74 in the index years 2017–2019, program sensitivity in the first year (0–12 months) was 92.9% after their first screening round and 89.9% after subsequent screening rounds (Table 3.6.4).

Program sensitivity in the 2 years (0–24 months) was 84.3% for the first screening round and 76.5% for subsequent screening rounds (Table 3.6.4).

Program sensitivity differs by screening round, being higher after a participant's first visit compared with their subsequent visits. This may be because participants 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 3.6.4: Program sensitivity, by time since screen, participants aged 50–74 screened in 2017–2019

	Time since screen	
	0–12 months	0–24 months
First screening round		
Crude rate	92.9	84.3
AS rate	93.2	85.0
Subsequent screening rounds		
Crude rate	89.9	76.5
AS rate	88.5	74.4

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 participants attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Program sensitivity by age

For the index years 2017–2019, program sensitivity (for both 0–12 months and 0–24 months) was lowest for participants aged 40–49, increasing with each 10-year age group to be highest for participants aged 75 and over (Table 3.6.5).

These results point to lower sensitivity of screening mammography for participants aged 40–49, meaning that BreastScreen Australia is less accurately able to detect invasive breast cancers in participants 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; Cancer Australia 2015b).

Table 3.6.5: Program sensitivity, all screening rounds, by age group, participants screened in 2017–2019

	Time since screen			
	0–12 months		0–24 months	
Age group (years)	**Crude rate**		**Crude rate**	
40–49	81.0		66.0	
50–59	88.0		74.3	
60–69	90.9		78.0	
70–74	92.8		82.1	
75+	93.2		85.1	

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.

Program sensitivity by state and territory

For the index years 2017–2019, for participants aged 50–74, program sensitivity rates for the period (0–24 months) varied across states and territories, ranging from 75.0% to 86.6% (all screening rounds) (Table A6.8).

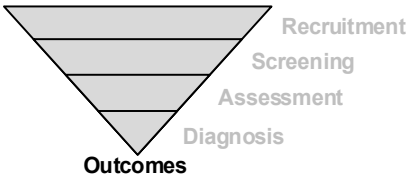
As noted for the interval cancer data, both interval cancers and program sensitivity in each state and territory are affected by the varying jurisdictional policies for managing symptomatic women. This affects the comparability of this indicator across jurisdictions.

See Box 3.6.1 for information on how different policies across state and territory BreastScreen programs affect interval cancer detection rates.

Box 3.6.2: 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 participants 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.

Participants 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 participants are recalled to assessment for further investigation when they do not have breast cancer. Most participants who are recalled to assessment through BreastScreen Australia do not have breast cancer.



Outcomes

Performance indicator 7a: Invasive breast cancer incidence

Summary

- In 2020, 17,984 new cases of breast cancer were diagnosed in women in Australia which is an incidence rate of 139.2 new cases per 100,000 women.
- In 2020, 10,921 new cases of breast cancer were diagnosed in women aged 50–74 in Australia which is an incidence rate of 306.7 new cases per 100,000 women.
- Breast cancer incidence for women aged 50–74 decreased as remoteness increased.
- Breast cancer incidence in women aged 50–74 decreased as socioeconomic disadvantage increased.

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 area, and Indigenous status is reported over a 5-year (instead of a 12-month) period.

Invasive breast cancer incidence data are reported per 100,000 females in the population.

Lower breast cancer incidence is better.

The Australian Cancer Database (ACD) currently contains data on all cases of cancer diagnosed from 1982 to 2020 for all states and territories.

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

Results

In 2020, the latest year of national data available in the Australian Cancer Database, there were 17,984 new cases of breast cancer diagnosed in women in Australia, equivalent to a crude rate of 139.2 new cases per 100,000 women (Table A7.2).

Of these 17,984 new cases, 10,921 (60.7%) occurred in women aged 50–74. This is equivalent to a crude rate of 306.7 new cases per 100,000 women aged 50–74 (Table A7.2).

Box 3.7.1: Invasive breast cancer detected through BreastScreen Australia

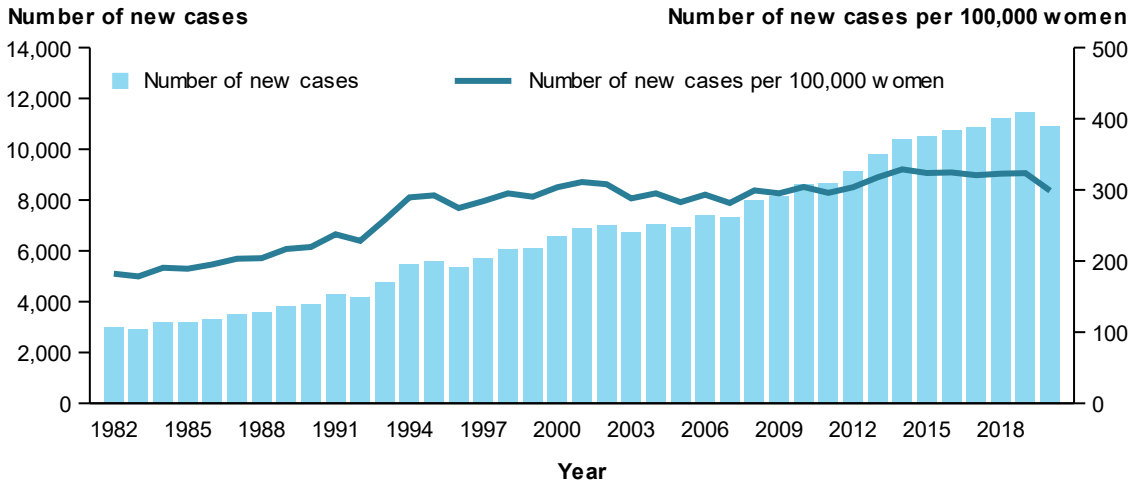
Almost half (45.6%) of all invasive breast cancer cases diagnosed in 2020 in women aged 50–74 were detected through BreastScreen Australia (33.4% for women aged 40 and over).

Incidence trends

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

Following the introduction of BreastScreen Australia, the age-standardised incidence rate of breast cancer per 100,000 women aged 50–74 increased from 238 new cases in 1991 to 311 in 2001. From 2002 to 2012, the rate per 100,000 women remained relatively steady at around 300, before increasing to 330 in 2014, and remaining relatively steady thereafter until 2020 when decreased to 300 new cases per 100,000 women aged 50–74 (Figure 3.7.1).

Figure 3.7.1: Incidence of breast cancer in women aged 50–74, 1982 to 2020



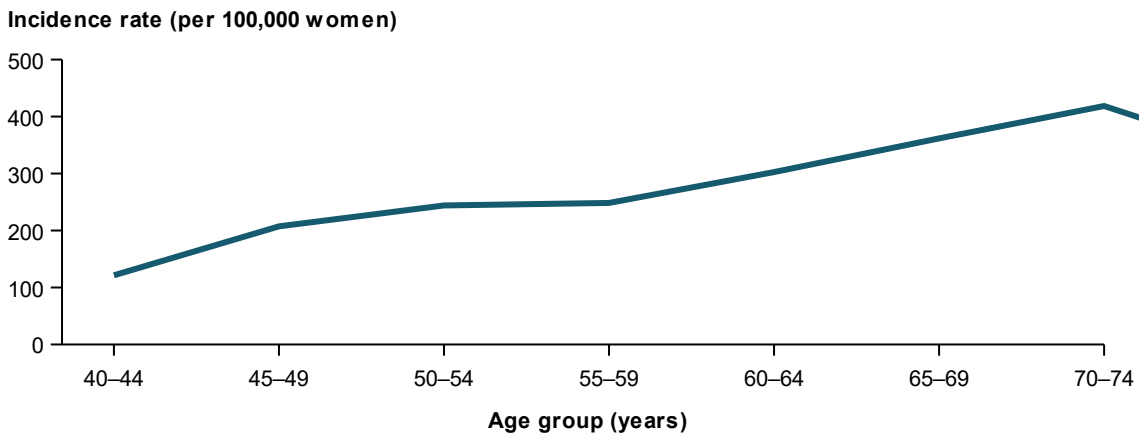
Note: Rates are age-standardised to the Australian population as at 30 June 2001 and expressed per 100,000 women.

Source: AIHW Australian Cancer Database 2020. Data for this figure are available in Table A7.1.

Incidence by age

In 2020, breast cancer incidence increased with increasing age, from 121.4 new cases per 100,000 women aged 40–44 to 418.5 per 100,000 women aged 70–74 (Figure 3.7.2).

Figure 3.7.2: Incidence of breast cancer in women, by age group, 2020



Note: Crude rates is the number of new cases of breast cancer expressed per 100,000 women.

Source: AIHW Australian Cancer Database 2020. Data for this figure are available in Table A7.2.

Invasive breast cancer incidence by type

Invasive breast cancers by type are shown in Table 3.7.1.

In 2020, the most common breast cancer type for women aged 50–74 was invasive ductal carcinoma, at 77.5% of all breast cancers; invasive lobular cancer was the second most common, at 14.0%. Other breast cancer types were rarer, ranging 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 2.2% of all invasive breast cancers; 'unspecified' breast cancers accounted for 1.1% of cases (Table 3.7.1).

Table 3.7.1: Incidence of breast cancer in women aged 50–74, by type, 2020

Type of breast cancer	New cases	Crude rate	Percentage of breast cancers
Invasive ductal carcinoma	8,464	237.7	77.5
Invasive lobular carcinoma	1,528	42.9	14.0
Medullary carcinoma and atypical medullary carcinoma	6	0.2	0.1
Tubular carcinoma and invasive cribriform carcinoma	157	4.4	1.4
Mucinous carcinoma	211	5.9	1.9
Invasive papillary carcinoma	235	6.6	2.2
Inflammatory carcinoma	23	0.6	0.2
Mesenchymal	10	0.3	0.1
Other—specified	170	4.8	1.6
Unspecified	115	3.2	1.1
Total	10,921	**306.7**	**100**

Notes

1. Crude rate is the number of new cases of breast cancer per 100,000 women.
2. Histology codes that comprise each breast cancer group appear in Table D1.

Source: AIHW Australian Cancer Database 2020.

Incidence by state and territory

In 2016–2020, the incidence of breast cancer for women aged 50–74 varied between 246.9 and 358.6 new cases per 100,000 women. Of note, the data for the least-populated jurisdictions are subject to variation due to smaller numbers, even with 5 years of combined data (Table A7.4).

Incidence by remoteness area

In 2016–2020, breast cancer incidence for women aged 50–74 decreased as remoteness increased.

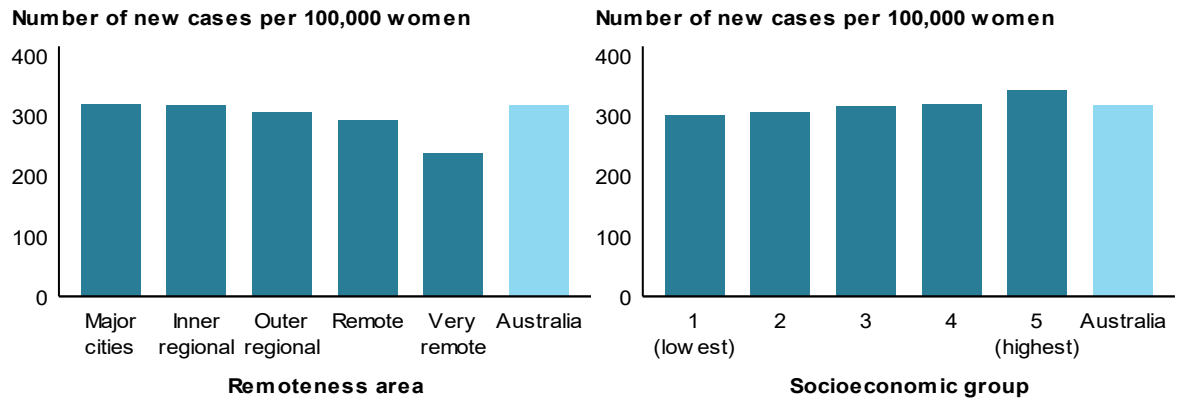
The age-standardised incidence rate for women aged 50–74 per 100,000 women was highest for those living in *Major cities* at 319.9 new cases and lower for those living in *Inner regional* areas and *Outer regional* areas at 317.2 and 305.5 new cases, respectively. The lowest incidence rates were for women living in *Remote* and *Very remote* areas at 292.5 and 238.2 new cases per 100,000 women, respectively (Figure 3.7.3).

Incidence by socioeconomic area

In 2016–2020, breast cancer incidence for women aged 50–74 decreased as socioeconomic disadvantage increased.

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 343.3 new cases, and lowest for those living in the lowest socioeconomic areas at 301.6 new cases (Figure 3.7.3).

Figure 3.7.3: Incidence of breast cancer in women aged 50–74, by remoteness area and socioeconomic area, 2016–2020



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

Source: AIHW Australian Cancer Database 2020. Data for this figure are available in tables A7.5 and A7.6.

Survival from invasive breast cancer

Survival in this report refers to 'relative survival'; which is 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.

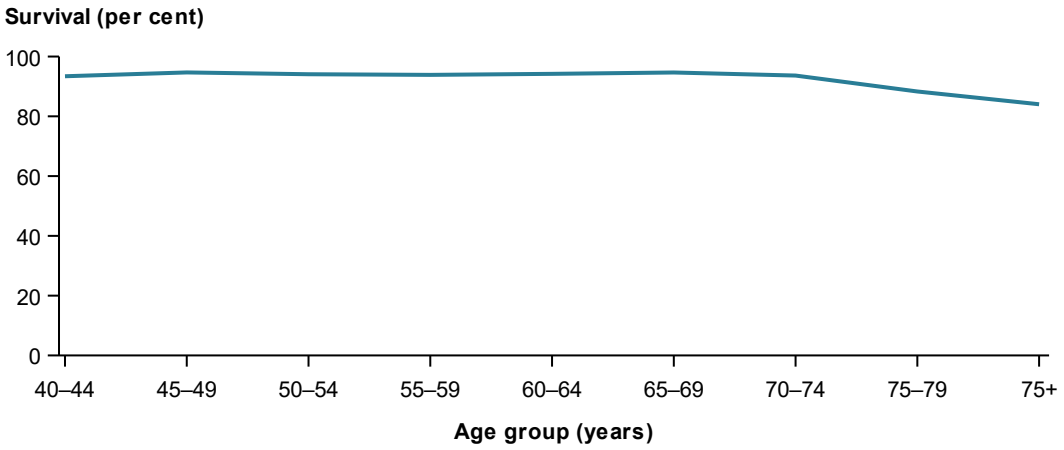
In 2016–2020, women diagnosed with breast cancer in Australia had a 92.3% chance of surviving for 5 years, compared with their counterparts in the general population (Table A7.7). For the target age group (50–74), 5-year relative survival was 94.1%.

Target age group (50–74 years)	All ages
94.1% 5-year relative survival (2016–2020)	92.3% 5-year relative survival (2016–2020)

Five-year relative survival by age

In 2016–2020, the 5-year survival rate from breast cancer was highest for women aged 45–49 and women aged 65–69, followed by women aged 50–64 (Table A7.7). Women aged 75 and over had a lower chance of surviving for 5 years, with a 5-year relative survival rate of 84.0% (Figure 3.7.4).

Figure 3.7.4: Five-year relative survival from breast cancer in women, by age group, 2016–2020



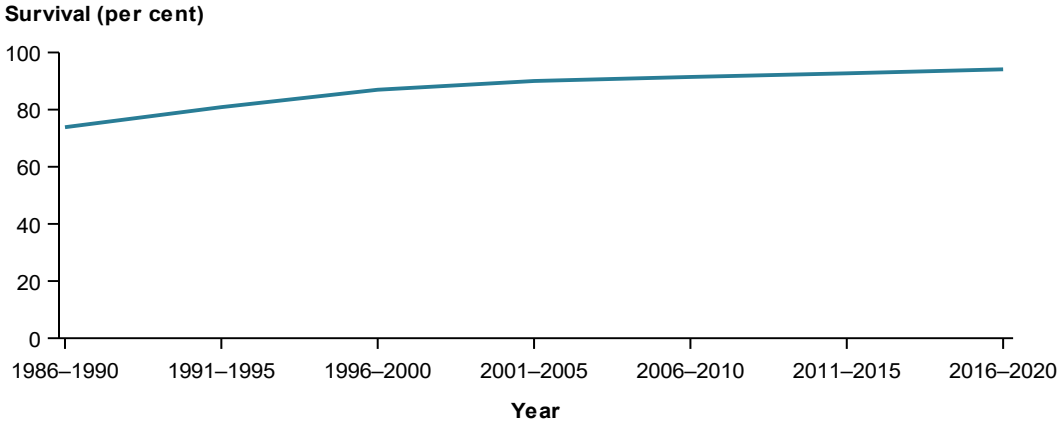
Note: Relative survival was calculated with the period method, using the period 2016–2020 (Brenner & Gefeller 1996).

Source: AIHW Australian Cancer Database 2020. Data for this figure are available in Table A7.7.

Five-year relative survival trends

Survival from breast cancer for women aged 50–74 has improved over time. Between 1986–1990 and 2016–2020, the 5-year relative survival rate rose from 73.8% to 94.1% (Figure 3.7.5).

Figure 3.7.5: Trends in 5-year relative survival from breast cancer in women aged 50–74, 1986–1990 to 2016–2020



Note: Relative survival was calculated with the period method, using the period 2016–2020 (Brenner & Gefeller 1996).

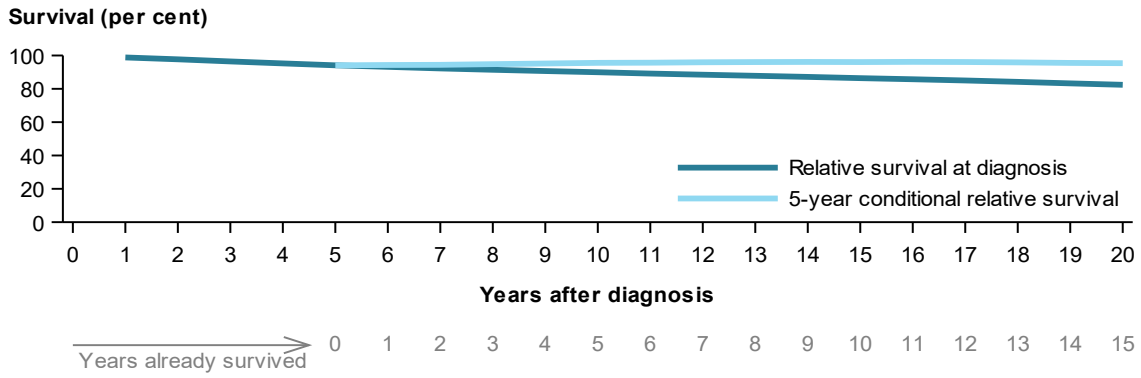
Source: Australian Cancer Database 2020. Data for this figure are available in Table A7.8.

Conditional survival

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.

In 2016–2020, when women aged 50–74 were first diagnosed with breast cancer, they had a 94.1% chance of surviving for at least 5 years after diagnosis compared with the general population (Figure 3.7.6). 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 96%.

Figure 3.7.6: Relative survival at diagnosis and 5-year conditional survival from breast cancer in women aged 50–74, 2016–2020



Note: Relative survival was calculated with the period method, using the period 2016–2020 (Brenner & Gefeller 1996).

Source: AIHW Australian Cancer Database 2020. Data for this figure are available in Table A7.9.

Prevalence of invasive 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 2020, there were 52,619 women aged 50–74 alive who had been diagnosed with breast cancer in the previous 5 years and 94,241 who had been diagnosed in the previous 10 years (Table 3.7.2; Figure 3.7.7).

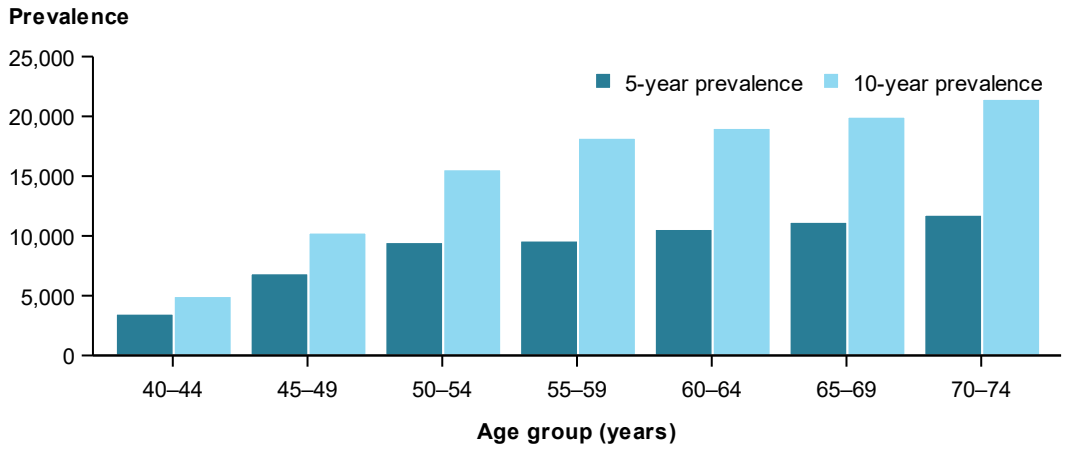
Table 3.7.2: Prevalence of breast cancer in women, by age group, Australia, end of 2020

Age group (years)	5-year prevalence	10-year prevalence
<40	3,007	3,780
40–44	3,497	4,970
45–49	6,873	10,281
50–54	9,484	15,574
55–59	9,614	18,207
60–64	10,579	19,030
65–69	11,174	19,970
70–74	11,768	21,460
75–79	7,539	15,125
80–84	4,895	9,669
85+	4,694	8,954
Ages 50–74	*52,619*	*94,241*
All ages	**83,124**	**147,020**

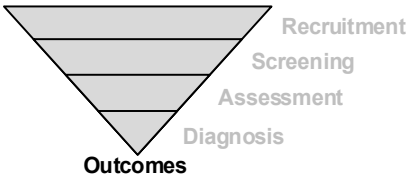
Note: Prevalence refers to the number of living people previously diagnosed with cancer, not the number of cancer cases.

Source: AIHW Australian Cancer Database 2020.

Figure 3.7.7: Prevalence of breast cancer in women, by age group, end of 2020



Source: AIHW Australian Cancer Database 2020.



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

Summary

In 2020, 2,248 new cases of DCIS were diagnosed in women in Australia, which is an incidence rate of 17.4 new cases per 100,000 women.

In 2020, 1,667 new cases of DCIS were diagnosed in women aged 50–74 in Australia, which is an incidence rate of 46.8 new cases per 100,000 women.

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 females 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 3.7.2 for more details.

The most recent incidence of DCIS data are for new cases diagnosed in 2020.

Results

In 2020, there were 2,248 new cases of DCIS diagnosed in Australian women, equivalent to a crude rate of 17.4 new cases for every 100,000 women in the population (Table A7.11).

Of these 2,248 new cases, 74.2% (1,667) were in women aged 50–74, the target population of BreastScreen Australia. These 1,667 new cases equated to a crude rate of 46.8 new cases of DCIS for every 100,000 women aged 50–74 (Table A7.11).

Box 3.7.2: 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 their 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 3.7.3: DCIS cases detected through BreastScreen Australia

Around 4 in 5 (78.4%) DCIS cases diagnosed in 2020 in women aged 50–74 were detected through BreastScreen Australia (68.3% for women aged 40 and over). See Box 3.7.2 for more information on DCIS incidence.

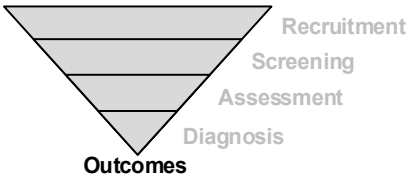
DCIS incidence trends

DCIS incidence rates have increased over time. For women aged 50–74, the age-standardised DCIS rate per 100,000 women rose from 40.6 new cases in 2002 to a peak of 55.1 in 2014, before falling to 46.0 new cases in 2020 (Table A7.10).

DCIS incidence by age

Similar to invasive breast cancer, the incidence of DCIS increases with increasing age. In 2020, the age-specific incidence rate of DCIS per 100,000 women rose from 19.7 new cases for women aged 40–49 to 49.4 for those aged 60–69 before falling to 33.0 for those aged 70 and over (Table A7.11).

In 2020, DCIS in women aged 50–74 represented 74.2% of all DCIS cases diagnosed in that year (Table A7.11).



Performance indicator 8: Mortality from breast cancer

Summary

- In 2022, there were 3,140 deaths from breast cancer in women in Australia, which is a mortality rate of 24.0 deaths per 100,000 women.
- In 2022, there were 1,404 deaths from breast cancer in women aged 50–74 in Australia, which is a mortality rate of 38.4 deaths per 100,000 women
- 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.

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 data are reported per 100,000 females in the population.

Mortality from breast cancer by state and territory, remoteness area, socioeconomic area, 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 2022.

Results

In 2022, the latest year of national data available in the AIHW National Mortality Database, there were 3,140 deaths from breast cancer in women in Australia. This is equivalent to a crude rate of 24.0 deaths per 100,000 women (Table A8.2).

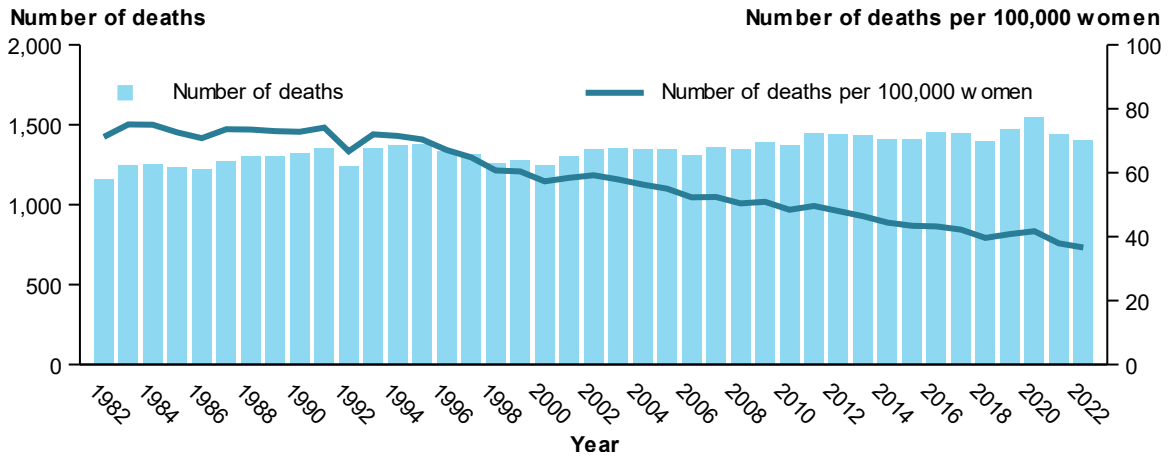
Of these 3,140 deaths, 44.7% (1,404) occurred in women aged 50–74, equivalent to a crude rate of 38.4 deaths per 100,000 women aged 50–74 (Table A8.2).

Mortality 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 37 deaths per 100,000 in 2022 (Figure 3.8.1).

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 3.8.1: Mortality from breast cancer in women aged 50–74, 1982 to 2022



Notes

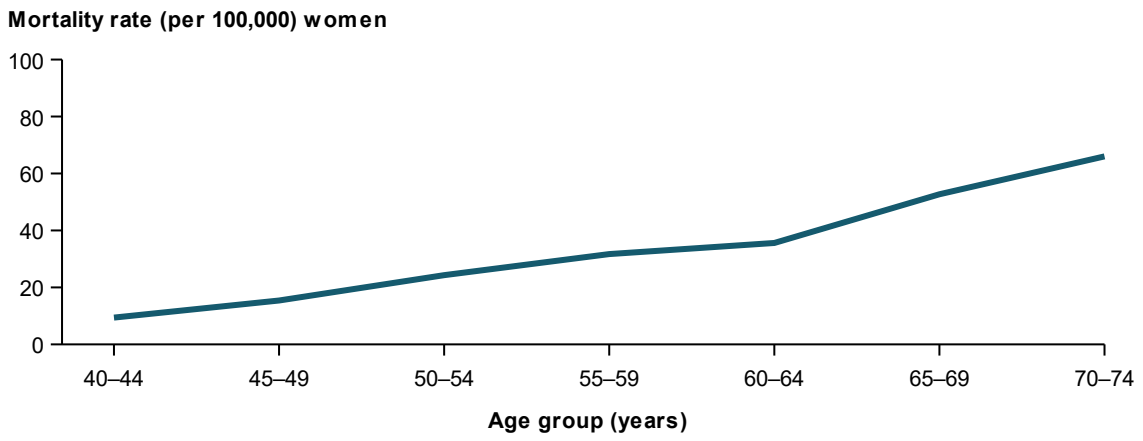
1. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 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 A8.1.

Mortality by age

In 2022, breast cancer mortality increased with age, from 6.5 deaths per 100,000 women aged 40–44 to 60.1 per 100,000 women aged 70–74 (Figure 3.8.2).

Figure 3.8.2: Mortality from breast cancer in women, by age group, 2022



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 A8.2.

Mortality by state and territory

In 2018–2022, the age-standardised mortality rate from breast cancer for women aged 50–74 varied between the states and territories, from 36.9 deaths per 100,000 women in Western Australia to 40.2 deaths per 100,000 in Victoria (Table A8.3).

Mortality by remoteness area

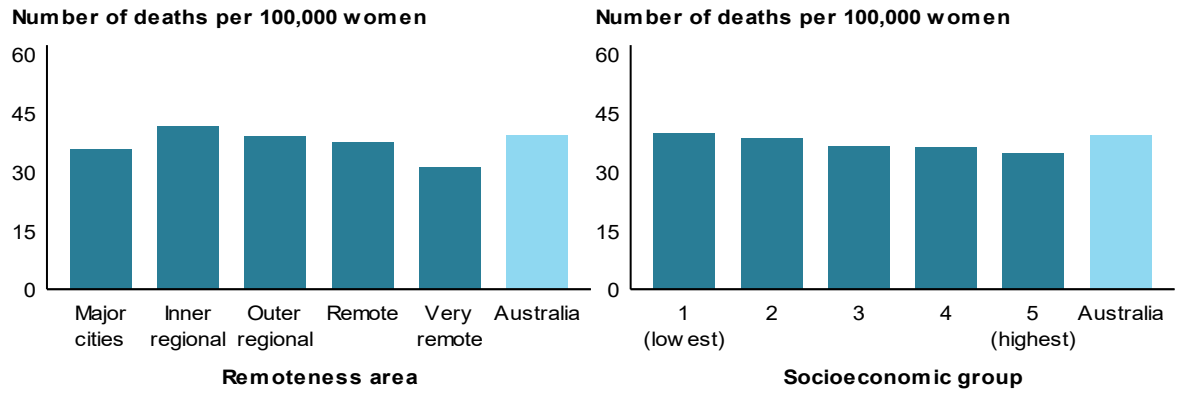
In 2018–2022, the age-standardised mortality rate from breast cancer for women aged 50–74 was highest per 100,000 women for those living in *Inner regional* areas, at 41.5 deaths, and lowest for those living in *Very remote* areas, at 31.2 deaths (Figure 3.8.3).

Mortality by socioeconomic area

In 2018–2022, the breast cancer mortality rate for women aged 50–74 increased with increasing socioeconomic disadvantage.

The age-standardised mortality rate for women aged 50–74 was highest per 100,000 women for those living in the lowest socioeconomic areas, at 39.9 deaths, and lowest for those living in the highest socioeconomic areas, at 34.7 deaths (Figure 3.8.3).

Figure 3.8.3: Mortality from breast cancer in women aged 50–74, by remoteness area and by socioeconomic area, 2018–2022



Notes

1. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 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 tables A8.4 and A8.5.

4 BreastScreen Australia outcomes in Aboriginal and Torres Strait Islander women

This chapter brings together data specific to Aboriginal and Torres Strait Islander women for BreastScreen Australia participation, breast cancer incidence, and breast cancer mortality that previously appeared in several places in this report.

Reporting key performance indicators by Indigenous status

Of the 8 performance indicators that are reported in this report, 3 have been reported by Indigenous status in this report, as indicated in Table 4.1.1.

Table 4.1.1: Performance indicators for the BreastScreen Australia Program reported by Indigenous status

Screening pathway	Performance indicator	Reported by Indigenous status
Recruitment	1 Participation	✓
	2 Rescreening	×
Screening	3 Recall to assessment	×
Assessment	There are no performance indicators to report for assessment	××
Diagnosis	4 Invasive breast cancer detection	×
	5 Ductal carcinoma in situ (DCIS) detection	×
	6a Interval cancers	×
	6b Program sensitivity	×
Outcomes	7a Invasive breast cancer incidence	✓
	7b Ductal carcinoma in situ (DCIS) incidence	×
	8 Mortality from breast cancer	✓

✓ = reported by Indigenous status; × = not reported by Indigenous status; ×× = not reported at all in this report.

The performance indicators selected for inclusion in this report are key breast screening performance indicators for the BreastScreen Australia program and considered highly relevant to the experience of Aboriginal and Torres Strait Islander participants in breast cancer screening.

However, it is important that Aboriginal and Torres Strait Islander peoples continue to decide the story that their data should reveal, which in the future may include additional performance indicators reported by Indigenous status, other information that Aboriginal and Torres Strait Islander peoples may like to add, as well as Aboriginal and/or Torres Strait Islander data presented in a different way that best reflects needs and aspirations.

Priority Reform 4 under the National Agreement on Closing the Gap aims to improve and share access to data and information to enable Aboriginal and Torres Strait Islander communities to make informed decisions (see Box 4.1.1).

Box 4.1.1: Priority Reform 4 under the National Agreement on Closing the Gap

The National Agreement on Closing the Gap was developed in partnership between the Coalition of Aboriginal and Torres Strait Islander Peak Organisations and Australian governments, with the objective to overcome the entrenched inequality faced by too many Aboriginal and Torres Strait Islander people so that their life outcomes are equal to all Australians.

Under this National Agreement, and following the guidance of Aboriginal and Torres Strait Islander people, 4 Priority Reforms have been designed to change the way that governments work with Aboriginal and Torres Strait Islander people.

The Priority Reforms will:

- Strengthen and establish formal partnerships and shared decision-making
- Build the Aboriginal and Torres Strait Islander community-controlled sector
- Transform government organisations so they work better for Aboriginal and Torres Strait Islander people
- Improve and share access to data and information to enable Aboriginal and Torres Strait Islander communities make informed decisions.

Priority Reform 4 Improve and share access to data and information to enable Aboriginal and Torres Strait Islander communities make informed decisions

Data and information sharing elements of Priority Reform 4:

- There are partnerships in place between Aboriginal and Torres Strait Islander representatives and government organisations to guide the improved collections, access, management, and use of data to inform shared decision-making for the benefit of Aboriginal and Torres Strait Islander people.
- Governments agree to provide Aboriginal and Torres Strait Islander communities and organisations access to the same data and information on which any decisions are made, subject to meeting privacy requirements, and ensuring data security and integrity.
- Governments collect, handle and report data at sufficient levels of disaggregation, and in an accessible and timely way, to empower local Aboriginal and Torres Strait Islander communities to access, use and interpret data for local decision-making.
- Aboriginal and Torres Strait Islander communities and organisations are supported by governments to build capability and expertise in collecting, using, and interpreting data in a meaningful way.

In addition, the Framework for Governance of Indigenous Data will be implemented across the Australia Public Service in 2024. This framework was co-designed by Australian Public Service agencies and Aboriginal and Torres Strait Islander and non-government partners. This Framework places Aboriginal and Torres Strait Islander people as its core, and is a single framework for Australian Public Service Agencies working with Indigenous data.

Implementation of this Framework will be guided by the following four principles:

1. Partner with Aboriginal and Torres Strait Islander people
2. Build data-related capabilities
3. Provide knowledge of data assets
4. Build an inclusive data system.

Participation of Aboriginal and Torres Strait Islander women

Indigenous status of women who participate in BreastScreen Australia is self-reported by women at the time of their screen.

In 2021–2022, a total of 33,461 Aboriginal and Torres Strait Islander participants aged 40 and over were screened through BreastScreen Australia. Of these, 28,002 (83.7%) were aged 50–74, which equates to a crude participation rate of 36.8% (Table 4.1.2).

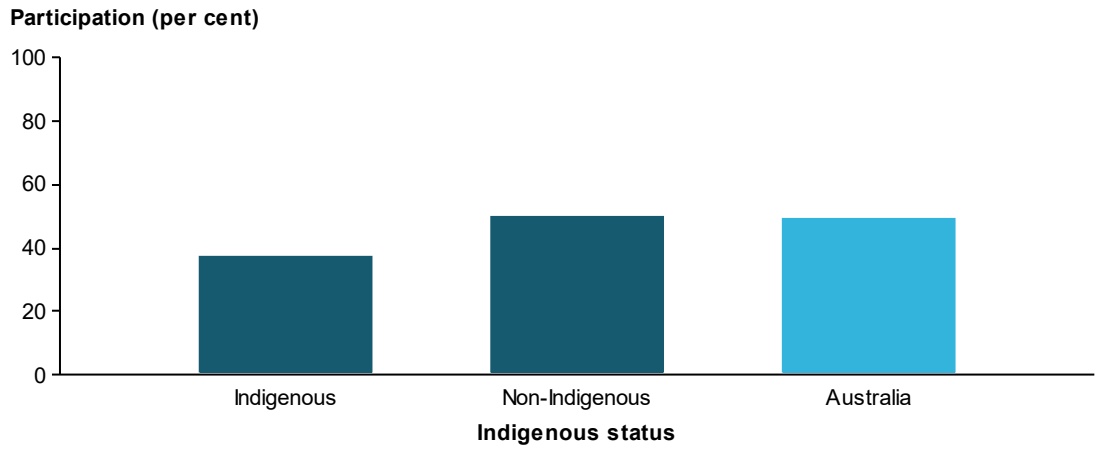
After adjusting for age, the participation rate of Aboriginal and Torres Strait Islander women aged 50–74 in BreastScreen Australia was 25% lower than for non-Indigenous women (37.0%, compared with the non-Indigenous rate of 49.6%) (Figure 4.1.1).

The crude participation rate of Aboriginal and Torres Strait Islander women aged 50–74 increased from 33.3% in 2014–2015 to 38.0% in 2018–2019 and decreased to 36.8% in 2021–2022 due to the impact of the COVID-19 pandemic from March 2020.

Aboriginal and Torres Strait Islander women have always had a lower participation rate than non-Indigenous women (Figure 4.1.2).

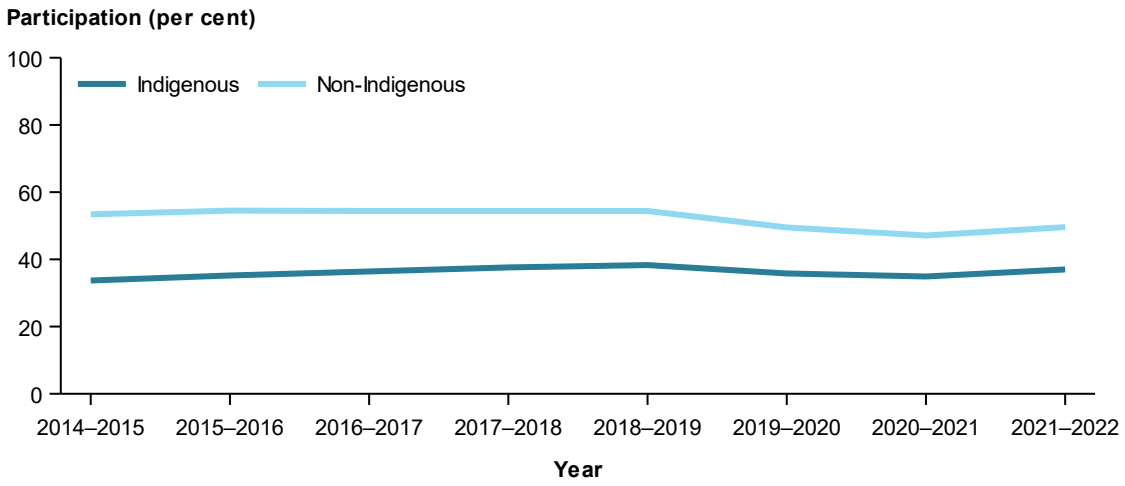
The lower participation rate of Aboriginal and Torres Strait Islander women may reflect a decreased opportunity to screen compared with non-Indigenous women. There may also be a level of under-reporting of Indigenous status in BreastScreen data (as Indigenous status is self-reported by participants at the time of their screen), which would also have the effect of lowering the participation rate.

Figure 4.1.1: Participation in BreastScreen Australia, participants aged 50–74, by Indigenous status, 2021–2022



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table 4.1.2.

Figure 4.1.2: Participation in BreastScreen Australia, participants aged 50–74, by Indigenous status, 2014–2015 to 2021–2022



Source: AIHW analysis of BreastScreen Australia data. Data for this figure are available in Table 4.1.3.

Results of a recent Queensland project, 'Closing the Gap in Breast Cancer Screening', suggest that different screening behaviour of Indigenous women may play a significant role in their lower participation rates. This project aimed to address barriers to screening for Aboriginal and Torres Strait Islander women through culturally appropriate messages, art shows and partnerships with local Indigenous groups, in order to build trust, educate and support Indigenous women to attend BreastScreen Australia. The project reported an increase in Aboriginal and Torres Strait Islander participation in Queensland from 49% to 56% in 2 years.

Initiatives such as these are common to state and territory BreastScreen programs. These strategies and initiatives are designed to be culturally sensitive and appropriate to the knowledge, attitudes and beliefs of Aboriginal and Torres Strait Islander women. They include dedicated and appropriate communication resources, group bookings for Indigenous women who would prefer to attend as a group, and the use of Indigenous artwork. BreastScreen workers liaise closely with Aboriginal Health Workers and Aboriginal and Torres Strait Islander community groups to increase the acceptance of screening.

Access to BreastScreen services can also be a barrier to participation in BreastScreen by Aboriginal and Torres Strait Islander women. This is particularly true for women living in *Very remote* areas. Recently, an interactive dashboard was developed showing the minimum time it takes women aged 50–74 from the general and Aboriginal and Torres Strait Islander populations to drive to a BreastScreen Australia screening service (AIHW 2024a). These data show that 26% of Aboriginal and Torres Strait Islander women aged 50–74 living in *Very remote* areas live over a 2-hour drive from a BreastScreen service that is open at least every 2 years (AIHW 2024a), which can limit access to services for these women.

Access to BreastScreen services for Indigenous women 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 (see Box 3.1.1 for more information on NAS Measures and accreditation). 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 3.1.1 shows the NAS Measures related to participation.

Incidence of invasive breast cancer for Aboriginal and Torres Strait Islander women

Breast cancer is the most common cancer diagnosed in Aboriginal and Torres Strait Islander women (AIHW 2023b).

Reliable national data on the diagnosis of cancer for Aboriginal and Torres Strait Islander women 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. Information in the ACD on Indigenous status is considered to be of sufficient completeness for reporting for New South Wales, Victoria, Queensland, Western Australia, the Australian Capital Territory, and the Northern Territory.

While the majority (91%) of Australian Indigenous people live in these 6 jurisdictions, the degree to which data for these jurisdictions are representative of data for all Indigenous people is unknown (ABS 2018).

The incidence counts and rates for Aboriginal and Torres Strait Islander people 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 people are misclassified as non-Indigenous. Therefore, the estimates presented should be interpreted with caution. In addition, age-standardised incidence rates should be used to compare the incidence of breast cancer for Aboriginal and Torres Strait Islander women and non-Indigenous Australian women to account for the different age structures of Indigenous populations and non-Indigenous populations.

Box 4.1.2: Aboriginal and Torres Strait Islander women —incidence and mortality: populations and rates

To derive breast cancer incidence and mortality rates for Aboriginal and Torres Strait Islander peoples, 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 Indigenous 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 notes that the population increase is greater than demographic factors alone can explain. In addition, 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.

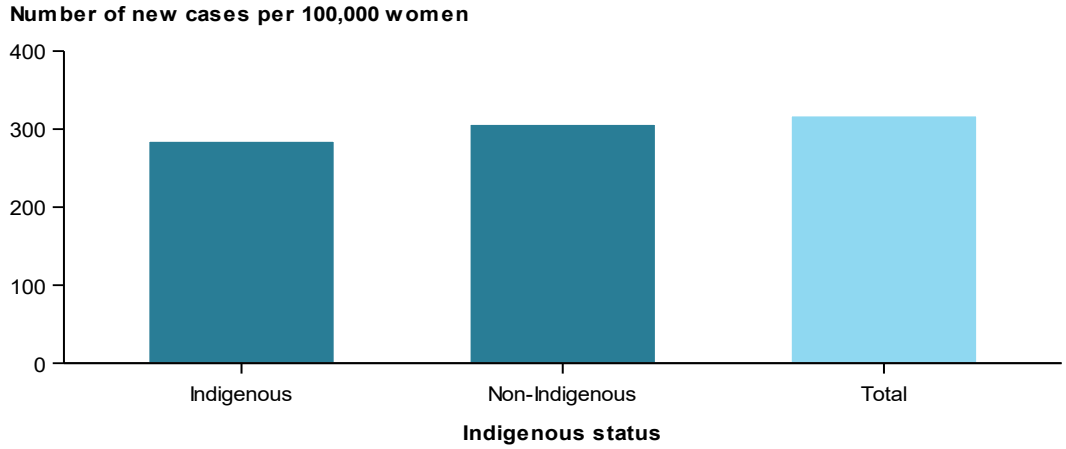
Indigenous population estimates based on the 2021 Census were released on 24 July 2024. These will be used to update data in future reports.

Analysis of data from these jurisdictions showed that, over the 5 years 2016–2020, there were 1,288 Aboriginal and Torres Strait Islander women diagnosed with breast cancer. This equates to 68.1 new cases per 100,000 women in the population.

Of the 1,288 breast cancers diagnosed in Aboriginal and Torres Strait Islander women, 818 (63.5%) were diagnosed in women aged 50–74, equating to 274.0 new cases per 100,000 women in the population.

After adjusting for age, in 2016–2020, Aboriginal and Torres Strait Islander women aged 50–74 had a lower age-standardised incidence rate of breast cancer than non-Indigenous women at 284.9 compared to 306.6 new cases per 100,000 women, respectively (Figure 4.1.3).

Figure 4.1.3: Incidence of breast cancer in women aged 50–74 (New South Wales, Victoria, Queensland, Western Australia, the Australian Capital Territory, and the Northern Territory), by Indigenous status, 2016–2020



Notes

1. Total includes women with a 'not stated' Indigenous status.
2. See Box 4.1.2 for more information on rates calculated using the 2016 Census.
3. Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW Australian Cancer Database 2020. Data for this figure are available in table 4.1.4.

Mortality from breast cancer for Aboriginal and Torres Strait Islander women

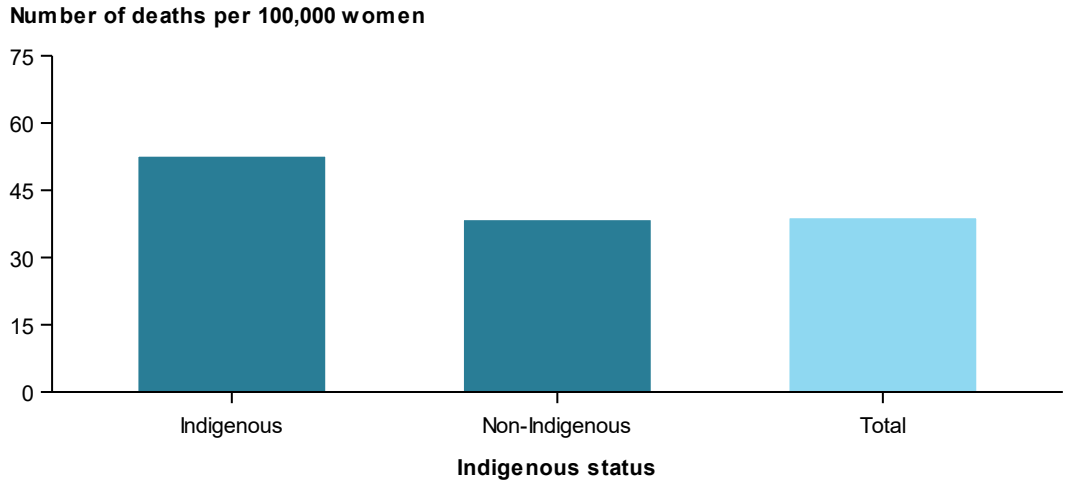
The source of mortality data is the AIHW National Mortality Database. Only mortality data from New South Wales, Queensland, Western Australia, South Australia and the Northern Territory are considered adequate for reporting by Indigenous status. Other jurisdictions have a small number of Aboriginal and Torres Strait Islander 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 Aboriginal and Torres Strait Islander people and non-Indigenous Australians. See Box 4.1.2 for information on Aboriginal and Torres Strait Islander rates calculated using Aboriginal and Torres Strait Islander population estimates from the 2016 Census.

Analysis of data from these jurisdictions showed that, over the 5 years 2018–2022, there were 237 Aboriginal and Torres Strait Islander women who died from breast cancer in Australia. This equates to 12.5 deaths per 100,000 women in the population.

Of the 237 breast cancer deaths in Aboriginal and Torres Strait Islander women, 154 (65.0%) were aged 50–74. This was a crude rate of 48.9 deaths from breast cancer per 100,000 women aged 50–74.

After adjusting for age, mortality among Aboriginal and Torres Strait Islander women in New South Wales, Queensland, Western Australia, South Australia, and the Northern Territory was 1.4 times the rate of non-Indigenous women over the 5 years 2018–2022 for women aged 50–74 (52.7 and 38.6 deaths per 100,000 women in the population, respectively) (Figure 4.1.4).

Figure 4.1.4: Mortality from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2018–2022



Notes

1. Total includes women with a 'not stated' Indigenous status.
2. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
3. 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 4.1.5.

Table 4.1.2: BreastScreen Australia participation, by Indigenous status, participants aged 50–74, 2021–2022

Indigenous status	Number	Crude rate	AS rate
Indigenous	28,002	36.8	37.0
Non-Indigenous	1,784,128	50.1	49.6
Australia	**1,820,994**	**50.1**	**49.5**

Notes

1. Indigenous status is self-reported; therefore, accuracy of Aboriginal and Torres Strait Islander participation rates will be affected if participants choose not to identify as Aboriginal and/or Torres Strait Islander at the time of screening.
2. Crude rate is the number of participants screened in 2021–2022 as a percentage of the ABS estimated resident population; age-standardised (AS) rate is the number of participants screened in 2021–2022 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
3. COVID-19 affected these results. Services had to reduce capacity due to the need to implement COVID-19 safety measures.
4. Australia includes 8,864 (0.5%) participants whose Indigenous status is not stated.
5. Aboriginal and Torres Strait Islander women are respectfully referred to as Indigenous women in this table.

Source: AIHW analysis of BreastScreen Australia data.

Table 4.1.3: BreastScreen Australia participation, by Indigenous status, participants aged 50–74, 2014–2015 to 2021–2022

	Indigenous			Non-Indigenous		
Reporting period	Number	Crude rate	AS rate	Number	Crude rate	AS rate
2014–2015	18,692	33.3	33.7	1,675,265	53.9	53.4
2015–2016	20,505	34.9	35.2	1,743,863	55.0	54.5
2016–2017	22,218	36.1	36.4	1,776,275	55.0	54.4
2017–2018	24,001	37.3	37.6	1,810,553	55.0	54.4
2018–2019	25,544	38.0	38.3	1,844,216	54.9	54.4
2019–2020[(a)]	24,918	35.5	35.8	1,719,784	50.1	49.5
2020–2021[(a)]	25,338	34.7	34.9	1,673,388	47.7	47.1
2021–2022[(a)]	28,002	36.8	37.0	1,784,128	50.1	49.6

(a) COVID-19 affected these results. Services had to reduce capacity due to the need to implement COVID-19 safety measures.

Notes

1. Indigenous status is self-reported; therefore, accuracy of Aboriginal and Torres Strait Islander participation rates will be affected if participants choose not to identify as Aboriginal and/or Torres Strait Islander at the time of screening.
2. Crude rate is the number of participants screened as a percentage of the ABS estimated resident population; age-standardised (AS) rate is the number of participants 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 2014–2015 to 2016–2017 have been updated. Therefore, these data may differ from previously published data.
5. Aboriginal and Torres Strait Islander women are respectfully referred to as Indigenous women in this table.

Source: AIHW analysis of BreastScreen Australia data.

Table 4.1.4: Incidence of invasive breast cancer in women aged 50–74 (New South Wales, Victoria, Queensland, Western Australia, the Australian Capital Territory, and the Northern Territory), by Indigenous status, 2016–2020

	NSW, VIC, Qld, WA, ACT and NT		
Indigenous status	**New cases**	**Crude rate**	**AS rate**
Indigenous	818	274.0	284.9
Non-Indigenous	46,770	312.8	306.6
Total	**49,422**	**323.8**	**317.5**

Notes

1. Data shown are for New South Wales, Victoria, Queensland, Western Australia, the Australian Capital Territory, and the Northern Territory only; data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer registration data at the time that this report was prepared.
2. 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.
3. 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.
4. Total includes 1,834 (3.7%) women whose Indigenous status is not stated.
5. Aboriginal and Torres Strait Islander women are respectfully referred to as Indigenous women in this table.

Source: AIHW Australian Cancer Database 2020.

Table 4.1.5: Mortality from breast cancer in women aged 50–74 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2018–2022

	Australia	NSW, Qld, WA, SA and NT		
Indigenous status	**Deaths**	**Deaths**	**Crude rate**	**AS rate**
Indigenous	169	154	48.9	52.7
Non-Indigenous	7,051	4,936	40.4	38.6
Total	**7,262**[(a)]	**5,109**[(b)]	**40.8**	**39.0**

(a) Total includes 42 (0.6%) women whose Indigenous status is not stated.
(b) Total includes 19 (0.4%) women whose Indigenous status is not stated.

Notes

1. Data shown for 'Australia' are for all states and territories combined; data shown for 'NSW, Qld, WA, SA, and NT' 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.
2. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 are based on preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
3. 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.
4. Aboriginal and Torres Strait Islander women are respectfully referred to as Indigenous women in this table.

Source: AIHW National Mortality Database.

Appendix A: Additional data tables

A1 Participation

Table A1.1: BreastScreen Australia participation, by reporting period, participants aged 50–74, 2014–2015 to 2022 –2023

Reporting period	Participants[a]	Population[b]	Crude rate[c]	AS rate[d]
2014–2015[f]	1,701,854	3,163,202	53.8	53.3
2015–2016[f]	1,772,540	3,229,497	54.9	54.4
2016–2017[f]	1,812,835	3,295,523	55.0	54.5
2017–2018[f]	1,841,333	3,361,946	54.8	54.3
2018–2019[f]	1,875,751	3,431,000	54.7	54.2
2019–2020[e] [f]	1,750,263	3,513,372	49.8	49.3
2020–2021[e]	1,705,274	3,586,982	47.5	47.0
2021–2022[e]	1,820,994	3,635,460	50.1	49.5
2022–2023[e] [g]	1,901,123	3,677,601	51.7	51.2

(a) 'Participants' refers to the number of participants aged 50–74 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 50–74, for the 2 reporting years.

(c) Crude rate is the number of participants aged 50–74 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 participants aged 50–74 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.

(e) COVID-19 affected these results.

(f) The population data from 2014–2015 to 2019–2020 have been updated. Therefore, these data may differ from previously published data.

(g) Data for 2022–2023 are preliminary. Note that actual participation data for 2022–2023 may differ from preliminary data for these years.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.2: BreastScreen Australia participation, by age group, 2021–2022

Age group (years)	Number	Crude rate
40–44	69,081	8.1
45–49	112,487	13.6
50–54	376,440	45.4
55–59	376,358	48.0
60–64	395,720	52.0
65–69	364,444	54.5
70–74	308,032	52.0
75+	76,058	7.1

Notes

1. Crude rate is the number of participants screened in 2021–2022, as a percentage of the ABS estimated resident population.
2. COVID-19 affected these results.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.3: BreastScreen Australia participation, by age group, 2011–2012, 2016–2017 and 2021–2022

	2011–2012		2016–2017		2021–2022[a]	
Age group (years)	Number	Crude rate	Number	Crude rate	Number	Crude rate
40–44	82,242	10.1	84,304	10.4	69,081	8.1
45–49	144,235	18.6	147,878	17.8	112,487	13.6
50–54	372,585	48.9	390,480	49.7	376,440	45.4
55–59	374,778	55.0	404,119	53.1	376,358	48.0
60–64	368,368	59.9	395,020	58.5	395,720	52.0
65–69	291,334	58.5	364,510	60.1	364,444	54.5
70–74	97,957	25.9	258,706	55.0	308,032	52.0

(a) COVID-19 affected these results.

Note: Crude rate is the number of participants aged 50–74 screened in each 2 year reporting period, as a percentage of the ABS estimated resident population.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.4: BreastScreen Australia participation, by state and territory, participants aged 50–74, 2021–2022

State and territory	Number	Crude rate	AS rate
NSW	542,039	47.4	46.7
Vic	462,427	50.9	50.5
Qld	383,968	51.3	50.8
WA	190,288	49.9	49.4
SA	149,538	53.9	53.0
Tas	53,969	58.6	57.9
ACT	29,340	53.1	52.7
NT	9,425	34.2	34.1
Australia	**1,820,994**	**50.1**	**49.5**

Notes

1. Crude rate is the number of participants screened in 2021–2022, as a percentage of the ABS estimated resident population; age-standardised (AS) rate is the number of participants screened in 2021–2022, 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 population, geographical size and structure, policies and other factors.
3. COVID-19 affected these results.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.5: BreastScreen Australia participation, by remoteness area, participants aged 50–74, 2021–2022

Remoteness area	Number	Crude rate	AS rate
Major cities	1,205,632	48.7	48.3
Inner regional	405,954	53.2	52.3
Outer regional	181,355	54.4	53.6
Remote	19,288	47.9	47.5
Very Remote	8,651	38.7	38.6
Australia[(a)]	**1,820,994**	**50.1**	**49.5**

(a) Includes participants in the 'not stated' category; therefore, rows may not sum to the Australia row.

Notes

1. Crude rate is the number of participants screened in 2021–2022 as a percentage of the ABS estimated resident population; age-standardised (AS) rate is the number of participants screened in 2021–2022 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
2. Participants were allocated to a remoteness area using their SA2 at the time of their screen where available, or postcode where SA2 was not available, according to the Australian Statistical Geography Standard (ASGS) for 2021.
3. Australia does not match the total number of participants across different remoteness areas because some participants were not able to be allocated to a remoteness area
4. COVID-19 affected these results.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.6: BreastScreen Australia participation, by socioeconomic area, participants aged 50–74, 2021–2022

Socioeconomic area	Number	Crude rate	AS rate
1 (lowest)	350,277	47.8	47.0
2	377,192	50.1	49.3
3	372,939	50.9	50.4
4	348,156	50.6	50.2
5 (highest)	371,809	51.1	50.8
Australia[(a)]	**1,820,994**	**50.1**	**49.5**

(a) Includes participants in the 'not stated' category; therefore, rows may not sum to the Australia row.

Notes

1. Crude rate is the number of participants screened in 2021–2022 as a percentage of the ABS estimated resident population; age-standardised (AS) rate is the number of participants screened in 2021–2022 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
2. Participants were allocated to a socioeconomic area using their SA2 at the time of their screen where available, or postcode where SA2 was not available, according to the Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-Economic Disadvantage for 2021.
3. Australia does not match the total number of participants across different socioeconomic areas because some participants were not able to be allocated to a socioeconomic area.
4. COVID-19 affected these results.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.7: BreastScreen Australia participation, by main language spoken at home, participants aged 50–74, 2021–2022

Main language spoken at home	Number	Crude rate	AS rate
English-speaking	1,542,413	52.7	52.3
Speak a language other than English	276,725	38.9	38.4
Australia[(a)]	**1,820,994**	**50.1**	**49.5**

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

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 participants screened in 2021–2022 as a percentage of the ABS estimated resident population; age-standardised (AS) rate is the number of participants screened in 2021–2022 as a percentage of the ABS estimated resident population, age-standardised to the Australian population at 30 June 2001.
3. COVID-19 affected these results.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.8: Number of screening mammograms performed, by month, participants aged 50–74, 2021 and 2022

	Year	
Month	**2021**	**2022**
January	71,484	63,470
February	81,859	78,522
March	90,933	90,735
April	79,565	67,256
May	88,113	84,503
June	87,045	83,239
July	80,008	81,321
August	68,715	93,701
September	62,863	84,832
October	67,854	84,478
November	86,492	89,607
December	59,336	57,271

Notes

1. COVID-19 affected these results.
2. Data are number of screening mammograms performed in participants aged 50–74 screened through BreastScreen Australia between 1 January 2021 and 31 December 2021, and between 1 January 2022 and 31 December 2022.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.9: Number of screening mammograms performed, by month, participants aged 50–74, 2022 and 2023

	Year	
Month	**2022**	**2023**
January	63,467	76,529
February	78,519	86,013
March	90,729	96,081
April	67,254	71,532
May	84,501	96,613
June	83,238	86,052
July	81,320	87,602
August	93,701	93,736
September	84,831	82,929
October	84,477	87,302
November	89,606	91,578
December	57,268	56,517

Notes

1. COVID-19 affected these results.
2. Data are number of screening mammograms performed in participants aged 50–74 screened through BreastScreen Australia between 1 January 2022 and 31 December 2022, and between 1 January 2023 and 31 December 2023.
3. Data for 2023 are preliminary. Note that actual participation data for 2023 may differ from preliminary data.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.10: Preliminary participation in BreastScreen Australia, by age group, 2022–2023

Age group (years)	Number	Crude rate
40–44	90,443	10.3
45–49	133,042	16.3
50–54	403,519	47.7
55–59	386,026	49.6
60–64	413,080	53.5
65–69	378,660	55.5
70–74	319,838	53.5
75+	89,392	8.0

Notes

1. Crude rate is the number of participants screened in 2022–2023, as a percentage of the ABS estimated resident population.
2. COVID-19 affected these results.
3. Note that actual participation data for 2022–2023 may differ from preliminary data for these years.

Source: AIHW analysis of BreastScreen Australia data.

Table A1.11: Preliminary participation in BreastScreen Australia, by state and territory, participants aged 50–74, 2022–2023

State and territory	Number	Crude rate	AS rate
NSW	609,318	52.9	52.4
Vic	463,802	50.5	50.2
Qld	391,156	51.3	50.7
WA	193,208	49.9	49.4
SA	148,957	53.4	52.5
Tas	53,415	57.8	57.1
ACT	31,493	56.6	56.4
NT	9,774	35.2	35.1
Australia	**1,901,123**	**51.7**	**51.2**

Notes

1. Crude rate is the number of participants screened in 2022–2023, as a percentage of the ABS estimated resident population; age-standardised (AS) rate is the number of participants screened in 2022–2023, 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. COVID-19 affected these results.
4. Note that actual participation data for 2022–2023 may differ from preliminary data for these years.

Source: AIHW analysis of BreastScreen Australia data.

A2 Rescreening

Table A2.1: Rescreening, by screening round, participants aged 50–72, 2014 to 2020

	First screening round	Second screening round	Third and subsequent screening rounds
Year	AS rate	AS rate	AS rate
2014	60.0	70.1	85.0
2015	60.9	69.8	84.6
2016	60.6	68.2	84.5
2017	59.5	68.5	84.1
2018[(a)]	44.2	51.3	68.1
2019[(a)]	41.1	46.6	65.1
2020[(a)]	50.1	58.2	75.9

(a) COVID-19 affected these results.
Note: Age-standardised (AS) rate is the number of participants rescreened within 27 months as a percentage of participants screened, age-standardised to the population of participants attending a BreastScreen Australia service in 2008.
Source: AIHW analysis of BreastScreen Australia data.

Table A2.2: Rescreening, by age group and screening round, participants screened during 2020

	First screening round	Second screening round	Third and subsequent screening rounds
Age group (years)	Crude rate	Crude rate	Crude rate
40–49	35.2	55.0	73.2
50–72	50.9	59.5	76.0
75+	20.8	23.3	38.4

Notes
1. Crude rate is the number of participants rescreened within 27 months as a percentage of participants screened.
2. COVID-19 affected these results.

Source: AIHW analysis of BreastScreen Australia data.

Table A2.3: Rescreening, by state and territory and screening round, participants aged 50–72 screened during 2020

	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
NSW	48.5	47.0	57.8	55.9	72.9	72.7
Vic	51.0	47.0	59.3	56.0	73.1	73.2
Qld	54.6	56.2	63.6	64.3	80.4	79.9
WA	45.1	43.2	54.8	52.4	75.9	75.5
SA	59.3	56.3	65.8	63.4	82.4	82.0
Tas	61.7	63.6	65.4	66.2	77.2	80.7
ACT	51.9	49.8	60.3	58.0	80.3	79.6
NT	35.3	33.7	41.9	40.8	67.2	67.0
Australia	**50.9**	**50.1**	**59.5**	**58.2**	**76.0**	**75.9**

Notes
1. Crude rate is the number of participants rescreened within 27 months as a percentage of participants screened'; age-standardised (AS) rate is the number of participants rescreened within 27 months as a percentage of participants screened, age-standardised to the population of participants attending a BreastScreen Australia service in 2008.
2. COVID-19 affected these results.

Source: AIHW analysis of BreastScreen Australia data.

A3 Recall to assessment

Table A3.1: Recall to assessment, participants aged 50–74, first and subsequent screening rounds, 2014 to 2022

	First screening round			Subsequent screening rounds		
Year	Number	Crude rate	AS rate	Number	Crude rate	AS rate
2014	9,379	12.3	12.2	31,080	3.9	4.0
2015	9,747	11.8	11.8	31,344	3.8	3.8
2016	10,133	11.5	11.3	31,635	3.7	3.7
2017	9,813	11.2	11.3	30,427	3.5	3.6
2018	9,794	11.3	11.2	31,231	3.5	3.5
2019	10,864	11.7	11.7	32,825	3.7	3.7
2020	7,416	11.4	11.4	29,745	3.8	3.8
2021	8,686	11.1	11.1	33,600	4.0	4.0
2022	9,880	11.0	10.6	33,704	3.9	3.9

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

Source: AIHW analysis of BreastScreen Australia data.

Table A3.2: Recall to assessment, by age group, first and subsequent screening rounds, 2022

	First screening round		Subsequent screening rounds	
Age group (years)	Number	Crude rate	Number	Crude rate
40–44	2,516	9.1	560	5.3
45–49	2,362	10.8	2,228	5.7
50–54	6,331	11.2	6,403	4.5
55–59	1,587	10.4	6,624	3.6
60–64	1,049	10.9	7,281	3.7
65–69	591	9.8	7,092	3.8
70–74	322	10.6	6,304	4.0
75+	109	13.1	2,091	4.7

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

Source: AIHW analysis of BreastScreen Australia data.

Table A3.3: Recall to assessment, by state and territory, participants aged 50–74, first and subsequent screening rounds, 2022

	First screening round			Subsequent screening rounds		
State and territory	**Number**	**Crude rate**	**AS rate**	**Number**	**Crude rate**	**AS rate**
NSW	2,658	9.8	10.1	10,081	3.5	3.6
Vic	2,961	11.8	11.3	8,235	4.0	4.1
Qld	1,590	9.1	8.8	6,279	3.6	3.6
WA	1,221	12.9	13.1	3,096	3.4	3.4
SA	953	15.3	14.4	4,331	6.2	6.3
Tas	240	9.2	9.4	877	3.6	3.6
ACT	158	11.4	11.2	630	4.1	4.2
NT	99	12.3	12.2	175	4.5	4.6
Australia	**9,880**	**11.0**	**10.6**	**33,704**	**3.9**	**3.9**

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

Source: AIHW analysis of BreastScreen Australia data.

A4 Invasive breast cancer detection

Table A4.1: All-size invasive breast cancer detection in participants aged 50–74, first and subsequent screening rounds, 2014 to 2022

	First screening round			Subsequent screening rounds		
Year	Number	Crude rate	AS rate	Number	Crude rate	AS rate
2014	672	88.0	115.2	4,408	56.0	51.2
2015	685	83.3	109.7	4,485	54.5	49.4
2016	739	83.9	103.3	4,721	55.4	50.4
2017	795	90.9	108.1	4,641	54.1	49.0
2018	789	90.7	113.5	4,851	54.8	49.5
2019	841	90.7	113.7	4,940	55.9	49.9
2020	571	87.7	114.7	4,407	57.0	50.4
2021[(a)]	749	95.8	122.0	4,848	57.3	50.8
2022	931	103.2	126.1	4,950	57.0	51.2

(a) Invasive breast cancer detection data for 2021 have been updated. Therefore, these data may differ from previously published data.

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

Source: AIHW analysis of BreastScreen Australia data.

Table A4.2: Small (≤15 mm) invasive breast cancer detection in participants aged 50–74, all screening rounds, 2014 to 2022

	All screening rounds		
Year	Number	Crude rate	AS rate
2014	2,962	34.3	32.3
2015	3,071	33.9	31.6
2016	3,205	34.1	31.7
2017	3,205	33.9	31.5
2018	3,308	34.0	31.5
2019	3,459	35.5	32.5
2020	2,972	35.4	32.0
2021[(a)]	3,275	35.4	32.4
2022	3,386	35.3	32.5

(a) Invasive breast cancer detection data for 2021 have been updated. Therefore, these data may differ from previously published data.

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

Source: AIHW analysis of BreastScreen Australia data.

Table A4.3: All-size and small (≤15 mm) invasive breast cancer detection, by age group, all screening rounds, 2022

	Size of breast cancer			
	All-size		Small (≤15 mm)	
Age group (years)	Number	Crude rate	Number	Crude rate
40–44	107	28.0	41	10.7
45–49	269	44.4	126	20.8
50–54	962	48.7	485	24.5
55–59	1,009	51.3	544	27.7
60–64	1,240	59.6	716	34.4
65–69	1,330	68.7	809	41.8
70–74	1,340	82.5	832	51.2
75+	583	128.6	330	72.8

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

Source: AIHW analysis of BreastScreen Australia data.

Table A4.4: Proportion of small (≤15 mm) invasive breast cancers detected in participants aged 50–74, all screening rounds, 2014 to 2022

	2014	2015	2016	2017	2018	2019	2020	2021[(a)]	2022
Proportion (%)	58.3	59.4	58.7	59.0	58.7	59.8	59.7	58.5	57.6

(a) Invasive breast cancer detection data for 2021 has been updated. Therefore, these data may differ from previously published data.

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

Source: AIHW analysis of BreastScreen Australia data.

Table A4.5: All-size invasive breast cancer detection participants aged 50–74, by state and territory and by screening round rounds, 2022

	All size breast cancer								
	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
NSW	289	106.4	142.1	1,710	59.9	53.5	1,999	64.0	59.7
Vic	220	88.0	105.5	1,110	54.5	49.4	1,330	58.2	55.1
Qld	171	97.4	106.4	909	52.2	47.8	1,080	56.4	53.6
WA	135	142.3	185.9	573	62.1	55.6	708	69.6	65.7
SA	63	101.4	128.3	407	58.4	50.3	470	61.9	56.1
Tas	33	127.0	146.2	137	56.4	52.4	170	63.2	60.9
ACT	10	71.9	70.9	79	51.8	47.8	89	53.5	51.1
NT	10	123.8	179.7	25	64.3	53.7	35	74.5	67.1
Australia	**931**	**103.2**	**126.1**	**4,950**	**57.0**	**51.2**	**5,881**	**61.3**	**57.7**

Notes

1. Crude rate is the number of participants with all size invasive breast cancer detected per 10,000 participants screened; age-standardised (AS) rate is the number of participants with all size invasive breast cancer detected per 10,000 participants screened, age-standardised to the population of participants 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 participants may be screened in one jurisdiction but have their breast cancer detected in another.

Source: AIHW analysis of BreastScreen Australia data.

Table A4.6: Small (≤15 mm) invasive breast cancer detection participants aged 50–74, by state and territory and by screening round rounds, 2022

	Small (≤15 mm) breast cancer								
	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
NSW	126	46.4	55.5	1,018	35.7	31.1	1,144	36.6	33.6
Vic	94	37.6	47.0	641	31.5	28.0	735	32.1	29.8
Qld	76	43.3	48.1	549	31.5	28.4	625	32.6	30.3
WA	63	66.4	82.4	336	36.4	32.2	399	39.2	36.5
SA	30	48.3	63.2	278	39.9	32.9	308	40.6	35.2
Tas	8	30.8	36.2	84	34.6	31.0	92	34.2	31.5
ACT	9	64.7	67.7	56	36.7	33.0	65	39.1	36.7
NT	3	37.1	33.7	15	38.6	32.1	18	38.3	35.0
Australia	**409**	**45.3**	**53.5**	**2,977**	**34.3**	**30.1**	**3,386**	**35.3**	**32.5**

Notes

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

Source: AIHW analysis of BreastScreen Australia data.

A5 Ductal carcinoma in situ detection

Table A5.1: DCIS detection, by year, participants aged 50–74, first and subsequent screening rounds, 2014 to 2022

	First screening round			Subsequent screening rounds		
Year	Number	Crude rate	AS rate	Number	Crude rate	AS rate
2014	173	22.7	23.9	1,197	15.2	14.8
2015	186	22.6	25.2	1,125	13.7	12.8
2016	209	23.7	27.5	1,131	13.3	12.7
2017	213	24.3	28.5	1,057	12.3	11.6
2018	202	23.2	27.1	1,182	13.4	12.6
2019	222	23.9	25.5	1,117	12.7	11.8
2020	169	26.0	30.3	1,138	14.7	13.7
2021[(a)]	170	21.7	23.9	1,193	14.1	13.0
2022	234	25.9	28.4	1,248	14.4	13.5

(a) DCIS detection data for 2021 have been updated. Therefore, these data may differ from previously published data.

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

Table A5.2: DCIS detection, by age group, all screening rounds, 2022

Age group (years)	Number	Crude rate
40–49	147	14.9
50–59	553	14.0
60–69	639	15.9
70–74	290	17.9
75+	115	25.4

Note: Crude rate is the number of participants with DCIS detected per 10,000 participants screened.
Source: AIHW analysis of BreastScreen Australia data.

Table A5.3: DCIS detection, by state and territory, participants aged 50–74, all screening rounds, 2022

State and territory	Number	Crude rate	AS rate
NSW	472	15.1	14.6
Vic	346	15.1	15.0
Qld	316	16.5	15.5
WA	179	17.6	17.8
SA	96	12.6	11.9
Tas	36	13.4	12.8
ACT	28	16.8	16.7
NT	9	19.2	19.5
Australia	**1,482**	**15.5**	**15.0**

Notes
1. Crude rate is the number of participants with DCIS detected per 10,000 participants screened; age-standardised (AS) rate is the number of participants with DCIS detected per 10,000 participants screened, age-standardised to the population of participants 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 participants may be screened in one jurisdiction but have their DCIS detected in another.

Source: AIHW analysis of BreastScreen Australia data.

A6a Interval cancers

Box A6.1: 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 any differences shown are of clinical significance.

Table A6.1: Interval cancer rate for participants aged 50–74 screened in index years 2017, 2018 and 2019, 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	8.1	5.8–10.8	6.2	5.7–6.8
Vic	8.7	5.8–12.3	6.1	5.5–6.8
Qld	8.0	5.0–12.1	5.6	5.0–6.4
WA	8.1	4.1–13.4	8.6	7.5–9.8
SA	4.2	1.3–9.0	6.1	5.0–7.3
Tas	2.3	0.1–12.9	6.8	4.9–9.1
ACT	5.7	1.5–14.5	6.7	4.3–9.8
NT	11.3	0.2–44.3	4.6	1.4–10.9
Australia	**7.9**	**6.6–9.4**	**6.3**	**6.0–6.6**

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

Source: AIHW analysis of BreastScreen Australia data.

Table A6.2: Interval cancer rate for participants aged 50–74 screened in index years 2017, 2018 and 2019, 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	11.1	8.4–14.3	10.7	10.0–11.6
Vic	11.5	8.3–15.4	12.0	11.1–12.9
Qld	12.7	9.0–17.2	12.5	11.5–13.6
WA	7.6	3.5–13.4	10.9	9.6–12.4
SA	14.5	7.7–23.5	12.6	11.0–14.4
Tas	10.0	3.4–22.3	9.4	7.2–12.1
ACT	4.5	0.9–13.0	11.2	8.0–15.1
NT	17.0	4.6–43.4	12.0	5.5–22.8
Australia	**11.3**	**9.6–13.0**	**11.6**	**11.1–12.0**

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

Source: AIHW analysis of BreastScreen Australia data.

Table A6.3: Interval cancers for participants screened in index years 2017, 2018 and 2019, 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	298	8.3	357	11.3
50–59	769	6.3	1,189	10.6
60–69	755	6.5	1,360	12.5
70–74	288	6.7	519	13.0
75+	99	10.0	140	15.2

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

Source: AIHW analysis of BreastScreen Australia data.

Table A6.4: Interval cancer rate for participants aged 50–74 screened in index years 2017, 2018 and 2019, 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	9.6	7.8–11.6	8.4	7.9–8.9	8.4	8.0–8.9
Vic	10.1	7.9–12.6	9.0	8.5–9.6	9.1	8.6–9.6
Qld	10.3	7.9–13.2	9.0	8.4–9.6	9.0	8.4–9.6
WA	7.8	4.9–11.5	9.7	8.8–10.6	9.6	8.8–10.5
SA	9.3	5.5–14.2	9.2	8.2–10.2	9.2	8.3–10.1
Tas	6.1	2.3–12.8	8.1	6.6–9.8	7.9	6.5–9.5
ACT	5.1	2.0–10.5	8.8	6.8–11.1	8.8	6.9–11.0
NT	14.2	3.5–34.1	7.6	4.1–12.8	9.4	5.7–14.5
Australia	**9.6**	**8.5–10.7**	**8.8**	**8.6–9.1**	**8.9**	**8.6–9.1**

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

Source: AIHW analysis of BreastScreen Australia data.

A6b Program sensitivity

Table A6.5: Program sensitivity for participants aged 50–74 screened in index years 2017, 2018 and 2019, 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	93.3	88.0
Vic	92.2	88.7
Qld	94.0	90.1
WA	92.3	85.9
SA	94.9	88.6
Tas	98.0	88.0
ACT	92.6	88.9
NT	95.3	95.0
Australia	**93.2**	**88.5**

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 participants attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A6.6: Program sensitivity for participants aged 50–74 screened in index years 2017, 2018 and 2019, 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	85.8	74.4
Vic	83.5	73.3
Qld	85.2	75.2
WA	86.7	74.0
SA	81.9	73.6
Tas	89.0	76.4
ACT	88.2	78.0
NT	89.4	86.7
Australia	**85.0**	**74.4**

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 participants attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

Table A6.7: Program sensitivity for participants screened in index years 2017, 2018 and 2019, 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	81.0	66.0
50–59	88.0	74.3
60–69	90.9	78.0
70–74	92.8	82.1
75+	93.2	85.1

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 A6.8: Program sensitivity for participants aged 50–74 screened in index years 2017, 2018 and 2019, 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	77.0
Vic	89.5	75.1
Qld	90.9	76.7
WA	86.8	76.0
SA	89.7	75.0
Tas	89.6	78.2
ACT	89.2	78.7
NT	94.9	86.6
Australia	**89.5**	**76.3**

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 participants attending a BreastScreen Australia service in 2008.

Source: AIHW analysis of BreastScreen Australia data.

A7a Invasive breast cancer incidence

Table A7.1: Incidence of invasive breast cancer in women, 1982 to 2020

	New cases		AS rate	
Year of diagnosis	50–74	All ages	50–74	All ages
1982	2,977	5,316	182.2	81.1
1983	2,933	5,378	178.3	80.9
1984	3,181	5,710	190.5	83.6
1985	3,210	5,912	189.2	84.3
1986	3,322	6,083	195.2	85.1
1987	3,523	6,704	203.2	91.4
1988	3,580	6,727	204.0	89.6
1989	3,838	7,174	216.9	93.5
1990	3,916	7,435	219.7	95.1
1991	4,298	8,036	237.6	100.3
1992	4,175	8,015	228.4	98.1
1993	4,780	8,783	258.0	105.5
1994	5,492	9,761	289.5	114.7
1995	5,596	10,085	292.3	116.5
1996	5,360	9,732	274.5	109.6
1997	5,704	10,200	284.2	112.1
1998	6,071	10,744	295.1	115.4
1999	6,119	10,685	290.4	112.2
2000	6,568	11,406	303.7	116.9
2001	6,906	11,838	311.0	118.4
2002	7,015	12,092	308.0	118.4
2003	6,734	11,877	288.0	113.6
2004	7,060	12,211	295.2	114.5
2005	6,941	12,280	282.7	112.9
2006	7,400	12,715	293.3	114.4
2007	7,318	12,658	281.6	111.1
2008	8,005	13,666	299.3	117.4
2009	8,144	13,796	295.1	115.6
2010	8,640	14,407	304.1	118.1
2011	8,645	14,560	295.8	116.8
2012	9,130	15,327	303.7	120.5
2013	9,803	16,406	317.7	126.6
2014	10,408	16,946	328.9	127.8
2015	10,517	16,963	323.7	125.3
2016	10,756	17,409	324.5	126.2

(continued)

Table A7.1 (continued): Incidence of invasive breast cancer in women, 1982 to 2020

	New cases		AS rate	
Year of diagnosis	**50–74**	**All ages**	**50–74**	**All ages**
2017	10,863	17,715	320.7	125.6
2018	11,210	18,209	322.8	126.2
2019	11,468	18,497	323.6	125.6
2020	10,921	17,984	298.9	119.2

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 All ages includes age groups from <20 to 85+.

Source: AIHW Australian Cancer Database 2020.

Table A7.2: Incidence of invasive breast cancer in women, by age group, 2020

Age group (years)	New cases	Crude rate
40–44	995	121.4
45–49	1,765	207.3
50–54	1,944	244.0
55–59	1,985	248.4
60–64	2,244	302.6
65–69	2,361	361.7
70–74	2,387	418.5
75–79	1,294	323.9
80–84	1,073	374.1
85+	1,009	316.8
50–74	*10,921*	***306.7***
All ages	**17,984**	**139.2**

Notes

1. Crude rate is the number of new cases of breast cancer per 100,000 women.
2. All ages includes age groups from <20 to 85+.

Source: AIHW Australian Cancer Database 2020.

Table A7.3: Incidence of invasive breast cancer in women, by age group and histology group, 2020

	Age group (years)			
Type of breast cancer	**40–49**	**50–59**	**60–69**	**70+**
Invasive ductal carcinoma	2,303	3,180	3,528	4,076
Invasive lobular carcinoma	279	495	662	889
Medullary carcinoma and atypical medullary carcinoma	4	4	2	2
Tubular carcinoma and invasive cribriform carcinoma	39	55	65	60
Mucinous carcinoma	46	51	87	201
Invasive papillary carcinoma	26	49	128	149
Inflammatory carcinoma	10	10	9	8
Mesenchymal	2	2	3	6
Other–specified	25	56	70	146
Unspecified	25	26	51	224

Source: AIHW Australian Cancer Database 2020.

Table A7.4: Incidence of invasive breast cancer in women aged 50–74, by state and territory, 2016–2020

State and territory	New cases	AS rate
NSW	17,782	320.0
Vic	13,656	314.1
Qld	11,198	319.1
WA	5,530	313.9
SA	4,459	330.5
Tas	1,331	294.8
ACT	943	358.6
NT	313	246.9
Australia	**55,218**	**317.9**

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 2020.

Table A7.5: Incidence of invasive breast cancer in women aged 50–74, by remoteness area, 2016–2020

Remoteness area	New cases	AS rate
Major cities	37,309	319.9
Inner regional	11,850	317.2
Outer regional	5,140	305.5
Remote	593	292.5
Very remote	234	238.2
Australia	**55,218**	**317.9**

Notes
1. Remoteness classification is based on area of usual residence (Statistical Local Area Level 2) at the time of diagnosis.
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 2020.

Table A7.6: Incidence of invasive breast cancer in women aged 50–74, by socioeconomic area, 2016–2020

Socioeconomic area	New cases	AS rate
1 (lowest)	10,457	301.6
2	11,033	305.6
3	11,226	316.6
4	10,653	319.2
5 (highest)	11,746	343.3
Australia	**55,218**	**317.9**

Notes

1. Socioeconomic area was allocated using the ABS Index of Relative Socio-Economic Disadvantage based on area of usual residence (Statistical Local Area Level 2) at the time of diagnosis.
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 2020.

Table A7.7: Five-year relative survival from breast cancer in females, by age group, 2016–2020

Age group (years)	5-year relative survival (%)
<20	n.p.
20–24	88.7
25–29	88.7
30–34	89.1
35–39	90.9
40–44	93.4
45–49	94.7
50–54	94.1
55–59	93.9
60–64	94.2
65–69	94.7
70–74	93.6
75+	84.0
50–74	*94.1*
All ages	92.3

n.p. = not published

Note: Relative survival was calculated with the period method, using the period 2016–2020 (Brenner & Gefeller 1996).

Source: AIHW Australian Cancer Database 2020.

Table A7.8: Trend in 5-year relative survival from breast cancer in women aged 50–74, 1986–1990 to 2016–2020

Year	5-year relative survival (%)
1986–1990	73.8
1991–1995	80.9
1996–2000	87.0
2001–2005	90.0
2006–2010	91.4
2011–2015	92.7
2016–2020	94.1

Note: Relative survival was calculated with the period method, using the period 2016–2020 (Brenner & Gefeller 1996).

Source: AIHW Australian Cancer Database 2020.

Table A7.9: Relative survival at diagnosis and 5-year conditional relative survival from breast cancer in women aged 50–74, 2016–2020

	Relative survival	Conditional survival	
Years after diagnosis	Relative survival (%)	Years already survived	5-year conditional relative survival (%)
1	98.8	. .	. .
2	97.7	. .	. .
3	96.4	. .	. .
4	95.2	. .	. .
5	94.1	0	94.1
6	93.2	1	94.3
7	92.2	2	94.4
8	91.4	3	94.8
9	90.7	4	95.2
10	90.0	5	95.6
11	89.2	6	95.7
12	88.5	7	95.9
13	87.8	8	96.1
14	87.2	9	96.1
15	86.4	10	96.1
16	85.7	11	96.2
17	85.0	12	96.1
18	84.2	13	95.9
19	83.3	14	95.5
20	82.4	15	95.4

Note: Relative survival was calculated with the period method, using the period 2016–2020 (Brenner & Gefeller 1996).

Source: AIHW Australian Cancer Database 2020.

A7b Ductal carcinoma in situ incidence

Table A7.10: Incidence of DCIS in women, 2002 to 2020

	New cases of DCIS		AS rate	
Year of diagnosis	**50–74**	**All ages**	**50–74**	**All ages**
2002	922	1,337	40.6	13.4
2003	975	1,397	41.7	13.6
2004	1,035	1,492	43.4	14.3
2005	1,053	1,499	42.8	14.0
2006	1,028	1,455	40.7	13.3
2007	1,073	1,549	41.3	13.8
2008	1,197	1,648	44.6	14.3
2009	1,236	1,731	44.9	14.7
2010	1,288	1,774	45.3	14.7
2011	1,317	1,823	44.9	14.8
2012	1,386	1,873	45.9	14.8
2013	1,567	2,143	50.8	16.7
2014	1,744	2,346	55.1	17.8
2015	1,702	2,274	52.4	16.9
2016	1,685	2,278	51.0	16.6
2017	1,615	2,184	47.9	15.6
2018	1,746	2,354	50.7	16.5
2019	1,722	2,347	48.7	16.1
2020	1,667	2,248	46.0	15.0

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 these 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 3.7.2 for more details.

Source: AIHW Australian Cancer Database 2020.

Table A7.11: Incidence of DCIS in women, by age group, 2020

Age group (years)	New cases of DCIS	Crude rate
40–49	330	19.7
50–59	640	40.1
60–69	689	49.4
70+	520	33.0
50–74	1,667	46.8
All Ages	**2,248**	**17.4**

Notes

1. New South Wales does not report these 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. All ages includes age groups from <20 to 85+.
4. 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 3.7.2 for more details.

Source: AIHW Australian Cancer Database 2020.

A8 Mortality from breast cancer

Table A8.1: Mortality from breast cancer in women, 1982 to 2022

	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	2,724	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	1,439	2,827	48.0	20.9
2013	1,436	2,872	46.4	20.5
2014	1,408	2,840	44.4	19.8
2015	1,413	2,904	43.4	19.9
2016	1,454	3,005	43.2	20.0
2017	1,448	2,974	42.2	19.4
2018	1,399	2,979	39.6	19.0

(continued)

Table A8.1 (continued): Mortality from breast cancer in women, 1982 to 2022

	Number of deaths		AS rate	
Year of death	50–74	All ages	50–74	All ages
2019	1,473	3,219	40.8	19.9
2020	1,547	3,152	41.7	19.0
2021	1,439	3,102	37.9	18.2
2022	1,404	3,140	36.6	17.8

Notes

1. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 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. All ages includes age groups from <20 to 85+.

Source: AIHW National Mortality Database.

Table A8.2: Mortality from breast cancer in women, by age group, 2022

Age group (years)	Number of deaths	Crude rate
40–44	56	6.5
45–49	117	14.3
50–54	185	22.0
55–59	247	31.7
60–64	268	34.9
65–69	347	51.4
70–74	357	60.1
75–79	372	81.9
80–84	372	121.9
85+	745	224.8
50–74	*1,404*	*38.4*
All Ages	**3,140**	**24.0**

Notes

1. Deaths in 2022 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.
3. All ages includes age groups from <20 to 85+.

Source: AIHW National Mortality Database.

Table A8.3: Mortality from breast cancer in women aged 50–74, by state and territory, 2018–2022

State and territory	Number of deaths	AS rate
NSW	2,345	40.0
Vic	1,861	40.2
Qld	1,460	38.8
WA	701	36.9
SA	554	38.1
Tas	182	38.8
ACT	109	38.6
NT	49	37.1
Australia	**7,262**	**39.3**

Notes

1. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 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 A8.4: Mortality from breast cancer in women aged 50–74, by remoteness area, 2018–2022

Remoteness area	Number of deaths	AS rate
Major cities	4,437	35.6
Inner regional	1,645	41.5
Outer regional	680	39.1
Remote	76	37.6
Very remote	34	31.2
Australia	**7,262**	**39.3**

Notes

1. Remoteness was classified according to the Australian Statistical Geography Standard (ASGS) see (Appendix D).
2. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 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 A8.5: Mortality from breast cancer in women aged 50–74, by socioeconomic area, 2018–2022

Socioeconomic area	Number of deaths	AS rate
1 (lowest)	1,481	39.9
2	1,507	38.4
3	1,348	36.5
4	1,270	36.2
5 (highest)	1,264	34.7
Australia	**7,262**	**39.3**

Notes

1. Socioeconomic area was allocated using the ABS Index of Relative Socio-economic Disadvantage (IRSD) see (Appendix D).
2. Deaths from 2018 to 2021 were derived by year of death; deaths in 2022 were derived by year of registration of death. Deaths registered in 2019 and earlier are based on the final version of cause-of-death data; deaths registered in 2020 are based on revised versions; and deaths registered in 2021 and 2022 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.

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 through dedicated screening and assessment services. Participants have a screening mammogram performed at a screening unit (which may be fixed, relocatable or mobile). Participants 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 participants 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 2022

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 participant 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 participant 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 participants aged 50–74 who have a screening mammogram through BreastScreen Australia in a 2-year period
2 Rescreening	The proportion of participants screened who return for a rescreen within 27 months
3 Recall to assessment	The proportion of participants screened who are recalled for further investigation
4 Invasive breast cancer detection	The number of participants with invasive breast cancer detected through BreastScreen Australia
5 Ductal carcinoma in situ detection	The number of participants 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 1.3* (AIHW 2024b).

Source: *BreastScreen Australia data dictionary: version 1.3* (AIHW 2024b).

National Accreditation Standards (NAS) Measures

Provision of a high-quality service 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 Measures are consistent with the performance indicators in this report and, where appropriate, the data in this report are reported against these Measures. This is 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.

NAS Measures that relate to these data, along with data analysed by the Australian Institute of Health and Welfare (AIHW), appear in tables 3.1.1, 3.2.1, 3.3.1, 3.4.2, 3.5.1 and 3.6.3 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

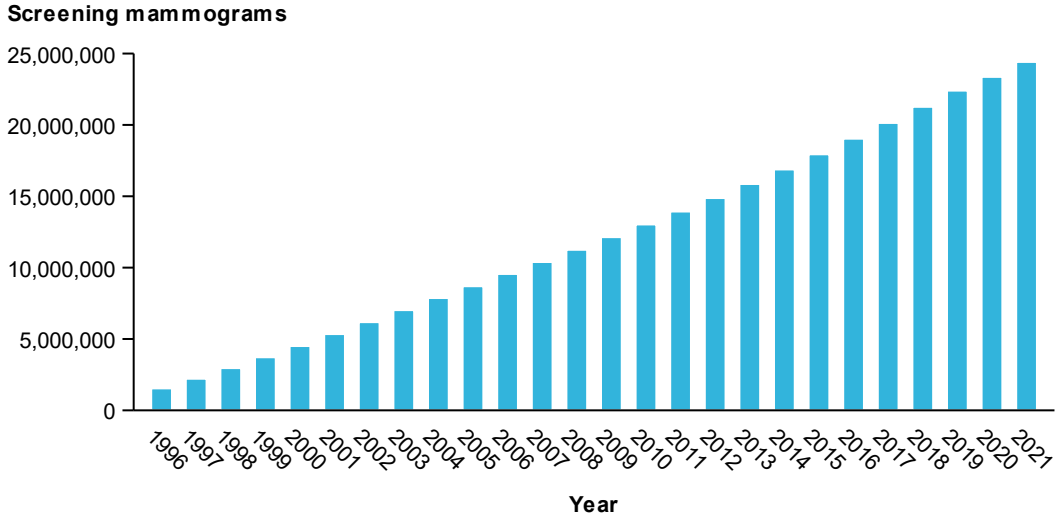
BreastScreen New South Wales	
Tel: (02) 8374 5777 Fax: (02) 8374 5699 Email: CINSW-Information@health.nsw.gov.au	https://www.breastscreen.nsw.gov.au/
BreastScreen Victoria	
Tel: (03) 9660 6888 Fax: (03) 9662 3881 Email: info@BreastScreen.org.au	www.BreastScreen.org.au
BreastScreen Queensland	
Tel: (07) 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

Box B4: BreastScreen Australia 1991 to 2021

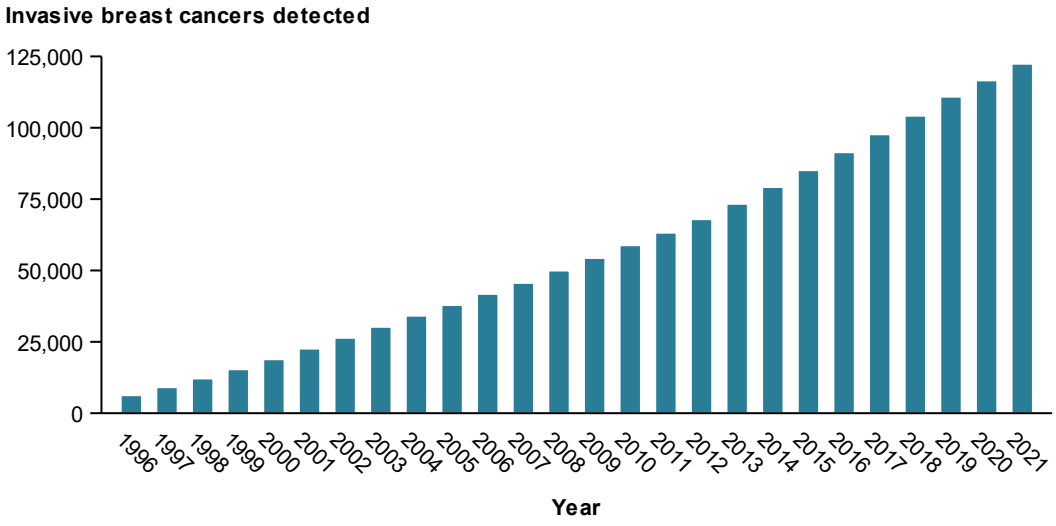
BreastScreen Australia was established in 1991 as the National Program for the Early Detection of Breast Cancer, with national data reported from 1996 onwards.

The number of screening mammograms performed, and invasive breast cancers detected by BreastScreen Australia, has been estimated over the years 1991 to 2021.

Over the years 1991 to 2021, it is estimated that BreastScreen has performed close to 25 million screening mammograms (cumulative total shown in figure below).



Over the years 1991 to 2021, it has been estimated that BreastScreen has detected over 120,000 invasive breast cancers (cumulative total shown in figure below).



Notes:

1. Data from 1991–1995 are included in the total for 1996 in the figures above.
2. Some state and territory BreastScreen programs did not commence from 1991 and/or do not have data for 1991–1995, so some data for 1991–1995 are estimates.
3. Invasive breast cancers exclude ductal carcinoma in situ (DCIS).

Source: State and territory BreastScreen register data.

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 2024*

Data used to monitor BreastScreen	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

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 1.3* (AIHW 2024b). 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/762055 (final data for 2021–2022)

https://meteor.aihw.gov.au/content/792375 (preliminary data for 2022–2023)

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 used in this report currently contains data on all cases of cancer diagnosed from 1982 to 2020 for all states and territories.

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 latest Data Quality Statement for the 2020 ACD can be found on the AIHW website at https://meteor.aihw.gov.au/content/index.phtml/itemId/793071.

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—and coded by the ABS—for deaths from 1964 to 2022. 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 (2022), 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 2019 and earlier are based on the final version of cause of death data; deaths registered in 2020 are based on the revised version; and deaths registered in 2021 and 2022 are based on preliminary versions. Revised and preliminary versions are subject to further revision by the ABS.

The data quality statements underpinning the AIHW NMD can be found on the following ABS internet pages:

- ABS quality declaration summary for Deaths, Australia
  Deaths, Australia methodology, 2022 | Australian Bureau of Statistics (abs.gov.au)
- ABS quality declaration summary for Causes of death, Australia
  Causes of Death, Australia methodology, 2022 | Australian Bureau of Statistics (abs.gov.au)

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/.

Deaths in Aboriginal and Torres Strait Islander peoples

The ABS Death Registrations collection identifies a death as Aboriginal and/or Torres Strait Islander where the deceased is recorded as Aboriginal or Torres Strait Islander 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 Aboriginal or Torres Strait Islander is given preference over identifying them as non-Indigenous.

Australian Burden of Disease Study

The Australian Burden of Disease Study (ABDS) 2023 used burden of disease analysis to measure the impact of 219 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, 2015, 2018, and 2023 (with 2023 being projected estimates). It includes estimates of total, fatal, and non-fatal burden for the total Australian population.

The ABDS 2018 includes the latest subnational burden of disease estimates, (by state or territory, remoteness area and socioeconomic area). 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 uses and adapts the methods of global studies to produce estimates that are more relevant to the Australian health policy context.

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 are available in *Australian Burden of Disease Study 2018: methods and supplementary material* (AIHW 2021).

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.

The projected incidence and mortality rates cited for 2024 in this report will sometimes differ from the rates that would occur if the Centre for Population data were used to calculate rates.

For the Indigenous Australians incidence and mortality comparisons in this report, the most recently released ABS Aboriginal and Torres Strait Islander estimated resident populations (based on the 2016 Census of Population and Housing (ABS 2018)) were used for 2016. While ABS Aboriginal and Torres Strait Islander projections (also based on the 2016 Census) were used for 2017–2022.

Appendix D: Classifications

Age

The data in this report are stratified by the age of the individual 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).

Remoteness area

Remoteness areas divide Australia into broad geographical regions that share common characteristics of remoteness for statistical purposes. 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: 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

Participants were allocated to a remoteness area using their Statistical Area Level 2 where available, or postcode where Statistical Area Level 2 was not available according to the 2021 Australian Statistical Geography Standard. As some Statistical Area Level 2 areas and postcodes can span different Remoteness areas, a weighting for each Remoteness area was attributed to the Statistical Area Level 2 or postcode in such cases. This can result in non-integer counts for remoteness classifications.

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 cancer incidence 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 2020 ACD. Cancer mortality rates by Remoteness Area were based on 2016 Remoteness Area classifications.

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.

Socioeconomic area

The Index of Relative Socio-Economic Disadvantage (one of four Socio-Economic Indexes for Areas developed by the ABS) 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 participants living in those areas and may not be correct for each person in that area.

In this report, the first socioeconomic area (quintile 1) corresponds to geographical areas containing the 20% of the population with the greatest socioeconomic disadvantage according to the Index of Relative Socio-Economic Disadvantage (that is, the lowest socioeconomic area), and the fifth area (quintile 5) corresponds to the 20% of the population with the least socioeconomic disadvantage (that is, the highest socioeconomic area).

Socioeconomic area for screening data

Participants were allocated to a remoteness area using their Statistical Area Level 2 where available, or postcode where Statistical Area Level 2 was not available according to the IRSD for 2021. Socioeconomic groupings (based on IRSD rankings) were calculated with a Statistical Area Level 2 correspondence, using a population-based method at the Australia-wide level.

Socioeconomic area 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 2016 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 2020 ACD.

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).

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)
Tubular carcinoma and invasive cribriform carcinoma	Tubular adenocarcinoma (8211)
	Cribriform carcinoma, NOS (8201)
Mucinous carcinoma	Mucinous adenocarcinoma (8480)
	Mucin-producing adenocarcinoma (8481)

(continued)

Table D1 (continued): Breast cancer by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Mucinous carcinoma	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)
	Micropapillary carcinoma NOS (8265)
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)
	Metaplastic carcinoma, NOS (8575)
Other—specified	Adenocarcinoma with squamous differentiation (8570)
	Adenocarcinoma with spindle cell metaplasia (8572)
	Squamous cell carcinoma, NOS (8070)
	Squamous cell carcinoma, keratinising, NOS (8071)

(continued)

Table D1 (continued): Breast cancer by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Other—specified	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)
	Granular cell tumour, malignant (9580)
	Adenosquamous carcinoma (8560)

(continued)

Table D1 (continued): Breast cancer by histology group

Breast cancer group	Type of breast cancer (ICD-O-3 codes)
Other—specified (continued)	Comedocarcinoma, NOS (8501)
	Small cell-large cell carcinoma (8045)
	Myxosarcoma (8840)
	Adenocarcinoma in adenomatous polyp (8210)
	Solitary fibrous tumour, malignant (8815)
	Papillary carcinoma, encapsulated (8343)
	Granular cell carcinoma (8320)
	Sex cord-gonadal stromal tumour, incompletely differentiated, malignant (8591)
	Carcinoma in pleomorphic adenoma (8941)
	Non-small cell carcinoma (8046)
	Basal cell carcinoma, nodular (8097)
	Superficial spreading adenocarcinoma (8143)
	Alveolar adenocarcinoma (8251)
	Papillary carcinoma, columnar cell (8344)
	Papillary cystadenocarcinoma NOS (8450)
	Hepatoid adenocarcinoma (8576)
	Malignant melanoma NOS (8720)
	Spindle cell rhabdomyosarcoma (8912)
	Synovial sarcoma NOS (9040)
	Malignant peripheral nerve sheath tumour (9540)
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)
	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 Aboriginal and Torres Strait Islander 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 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
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 gene 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):

(a) 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)
(b) 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
(c) breast cancer diagnosed in a participant by BreastScreen Australia within 24 months of a negative screen (early rescreen) if the participant presents with a breast lump and/or clear or bloodstained nipple discharge in the breast in which the breast cancer is diagnosed
(d) an invasive breast cancer diagnosed between 6 and 24 months after a recommendation for assessment is made and a participant 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).

person-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 participants who screen annually rather than every 2 years (who would be at risk for the first year after their screen but not the second).

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) a recommendation is made to return the participant to routine rescreening

(b) a recommendation is made for early review at 6 months or more from the screening date

(c) a diagnosis of cancer is made

(d) the participant fails to attend for technical recall or assessment within 6 months

(e) the participant dies.

screening round: The first screening round is a participant's first visit to a mammography screening service; a subsequent screening round means that they have been screened before. For example, if they attend for a fourth screening round, they have 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.

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.

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50% of women in the targeted age group of 50–74 participated in BreastScreen Australia in 2021–2022, with over 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 37 deaths per 100,000 women in 2022.

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