

7 Mammography

Mammography involves an X-ray examination of the breast in order to determine if abnormalities (including tumours) exist. Mammography can be used either as a screening or a diagnostic tool. The aim of mammography for breast cancer screening purposes is to detect tumours early, before symptoms arise (i.e. at an earlier stage than would otherwise have been the case) in order to improve prospects for survival. In Australia, screening mammograms are available to eligible women at no charge through the BreastScreen Australia Program; medical referrals for such mammograms are not required.

In contrast, diagnostic mammography is undertaken to determine if cancer is present in a person with abnormal signs or symptoms – such as a breast lump or nipple discharge. The symptoms may have been noticed by the person, by a doctor or through screening. Compared with the two X-ray views usually taken when mammography is conducted for screening, diagnostic mammography generally involves additional views of the breast. Hence, diagnostic mammography is typically more time-consuming and costly than screening mammography. Following diagnostic mammography, women whose abnormalities remain suspicious may require additional breast imaging (with examinations such as ultrasound, magnetic resonance imaging or a ductogram) and/or a biopsy. In Australia, diagnostic mammograms are generally provided by organisations such as private radiology clinics and public hospital radiology departments. Rebates for mammograms are available through the Medicare Benefits Schedule (MBS). However, diagnostic mammograms are also undertaken in some states and territories through the BreastScreen Australia Program in response to abnormal screening mammograms.

In this chapter, information on the use of mammography in Australia is presented. The first section provides data on the number of women obtaining a screening mammogram through the BreastScreen Australia Program. Some women may choose to obtain a screening mammogram outside of the BreastScreen program (e.g. at a private radiology clinic) although the extent to which this occurs is unknown. Thus data on mammography as provided through the BreastScreen Australia Program provide a minimum count of the number of women who had a mammogram for screening purposes.

Data from Medicare Australia are presented in the second section. In Australia, the cost of mammograms that are provided by a registered provider for services that qualify for a Medicare benefit is subsidised by the Australian Government through the MBS. The MBS is managed by the Department of Health and Ageing and administered by Medicare Australia. Referrals from a general practitioner or other medical practitioner are required for eligibility for the subsidy.

The MBS distinguishes between two types of mammography services:

- mammography of both breasts (which is referred to as item number 59300)
- mammography of one breast (item number 59303).

Documentation about the MBS indicates that MBS-funded mammography should include both breasts unless the referral specifically requests a mammography of just one breast (DoHA 2009b). The MBS also notes that both types of mammography services are to be used in the investigation of clinical abnormalities – that is, for diagnostic purposes – and not for the screening of those who are asymptomatic. However, some screening mammograms – for example, for women with a family history of breast cancer – are also funded through the

MBS (Stieber 2005) and are coded to the same item numbers noted above. Note that no information is available on the proportion of MBS-funded mammograms undertaken for screening rather than diagnostic purposes.

Screening mammography

The BreastScreen Australia Program, which was established in 1991, is funded jointly by the Australian and the state and territory governments. The primary responsibility for implementing the program rests with the jurisdictions, while the Australian Government provides overall coordination of policy formulation, national data collection, quality improvement and evaluation (DoHA 2009a). As discussed in Chapter 2, screening mammography activities were rolled out at different times in each state and territory, with commencement dates ranging from 1989 to 1994.

The main objective of the BreastScreen Australia Program is to reduce mortality and morbidity from breast cancer. This is achieved through the provision of screening mammograms at the population level to 'healthy' (i.e. asymptomatic) women in order to detect masses or calcifications that are characteristic of breast cancer. Mammography is considered to be the single most effective population-based method of detecting breast cancer early since it can identify cancer several years before physical symptoms develop. Women with a breast cancer that was detected at an early stage, as discussed in Chapter 4, have a better chance of survival. Furthermore, early diagnosis can permit breast-conserving surgery, decrease complications related to intensive treatment and reduce the likelihood of recurrence (ACS 2007; Stewart & Kleihues 2003).

Women aged 40 years and over who are Australian citizens or have permanent residency status are eligible for mammograms through the BreastScreen Australia Program. However, women aged 50 to 69 years are the target group and they are actively recruited through, for example, the sending out of invitations and focused advertising (NQMC 2004). Women aged 50 to 69 years were chosen as the target group for two reasons: the incidence of breast cancer in this group is comparatively high (as illustrated in Chapter 2); and, in trials, screening mammography has been found to be effective in reducing mortality for these women (NQMC 2004). In contrast, mammographic screening for women aged less than 50 years is thought to be less effective due to biological differences in breast tissue (e.g. greater breast density of pre-menopausal women) which results in the need for additional investigations and a greater number of missed cancers (Irwig et al. 1997).

The BreastScreen Australia Program has eight performance indicators that cover the aspects of participation, cancer detection, sensitivity, detection of ductal carcinoma in situ (DCIS), recall to assessment and rescreening within the BreastScreen Australia Program, as well as incidence of breast cancer and DCIS, and mortality from breast cancer in Australia. Information relating to performance of the program against each of these indicators is covered in detail in the annual BreastScreen Australia Program monitoring reports produced by the AIHW (2009b).

In this report, data from the BreastScreen Australia Program that relate specifically to the number of women who obtained a screening mammogram are described. Since the BreastScreen Australia Program recommends that a woman in the target age group has a screening mammography every 2 years, the measure of participation used for the purposes of this report is the proportion of women in the eligible population (and the target

population) who were screened through the BreastScreen Australia Program in a 24-month period (i.e. from 1 January of the first year to 31 December of second year).

The most recently published national data pertain to the 2-year period of 2005 and 2006, with trend data available from 1996. Data are shown for all women who participated in the program (who by definition must be aged 40 years or over) as well as for those in the target group. Given the active recruitment of women in the target age group, it is expected that participation of those women will be much higher than other women. Differences in participation by other characteristics – such as geographical location and Indigenous status – are also considered.

The data that were analysed for the purposes of this section of the report were provided to the AIHW by state and territory BreastScreen programs (see Appendix C for further information). Note that rates are expressed per 100 women (not per 100,000 women as was used for cancer incidence and mortality) and are often referred to as a percentage.

Screening mammography in 2005–2006

Over 1.6 million women had a screening mammogram through the BreastScreen Australia Program in the 2-year period from 1 January 2005 to 31 December 2006 (Table 7.1). This equates to one in three women (34%) aged 40 years and over being screened during that time period. Just over three in four (77%) of these women were in the target age group for the program. Overall, 57% of all Australian women aged 50 to 69 years had a screening mammogram during the 2005–2006 period.

Table 7.1: Participation in the BreastScreen Australia Program, females, 2005–2006^(a)

	Number of females	Per cent of females ^(b)
50–69 years	1,241,796	56.9
Total (40+ years)	1,622,481	34.0

(a) Period covers 1 January 2005 to 31 December 2006.

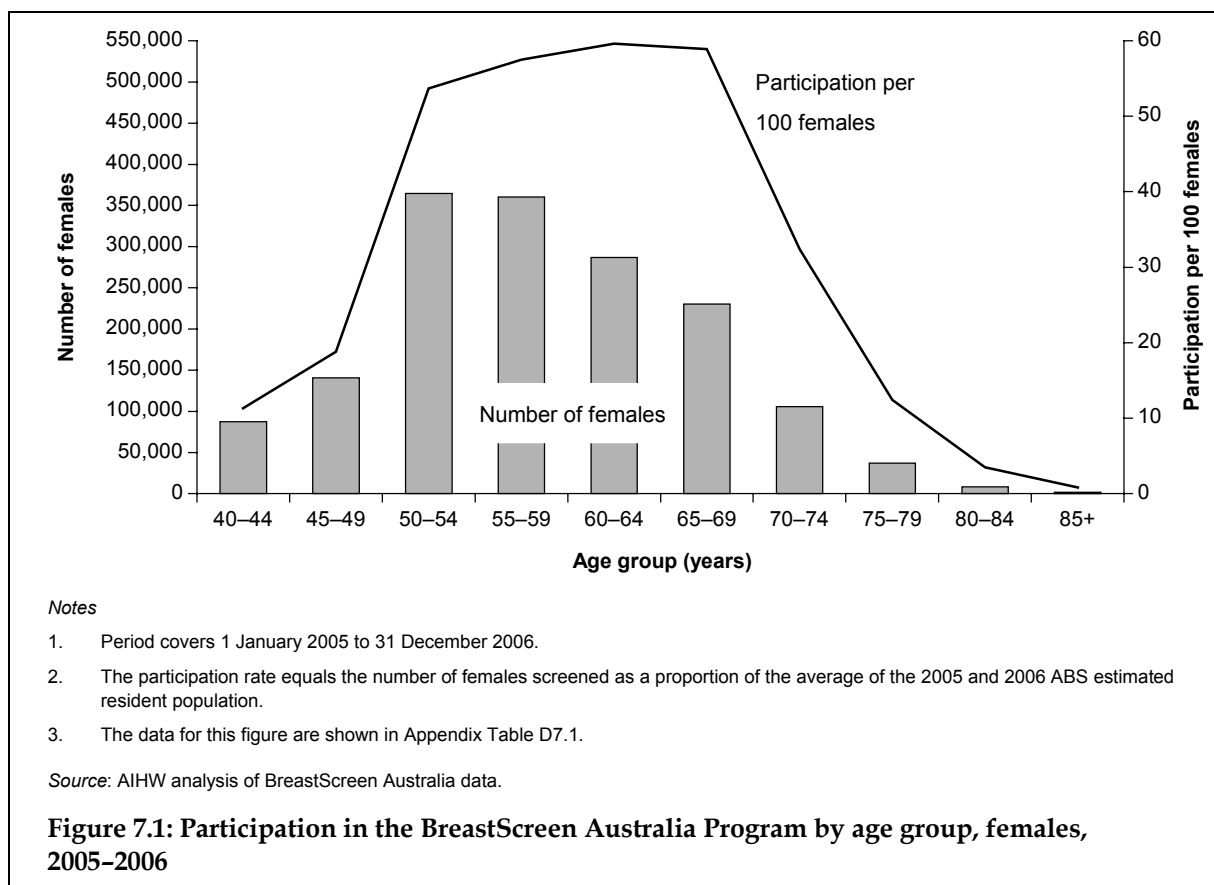
(b) Equals the number of females screened as a proportion of the average of the 2005 and 2006 ABS estimated resident population.

Source: AIHW analysis of BreastScreen Australia data.

Differences by age

The number of women at different ages who were screened through the BreastScreen Australia Program is shown in Figure 7.1. While over 1.2 million women who had a screening mammogram were in the target age group, around 228,000 women aged 40 to 49 years also had a screening mammogram, as did nearly 153,000 women aged 70 years and over.

Participation rates by age are also shown in Figure 7.1. In line with the active recruiting of women in the target age range for the BreastScreen Australia Program, relatively high participation rates were evident for women in each of the age groups from 50 to 54 years to 65 to 69 years. For those women, participation ranged from 54% (for those aged 50 to 54 years) to 60% (for those aged 60 to 64 years). In contrast, the rates were lowest for women in the oldest age groups – namely, those aged 80 to 84 years (4% of women were screened) and those aged 85 years and over (1%).



Trends

Trends in the number of women who had a mammogram through the BreastScreen Australia Program are shown in Table 7.2. The number of women aged 50 to 69 years who were screened through the BreastScreen Australia Program increased by 47% between 1996-1997 and 2005-2006. Between the two most recent screening periods for which data are available (i.e. 2004-2005 and 2005-2006), there was a 4% increase in the number of these women who had a screening mammography. Participation rates are also shown in Table 7.2, with the screening rates for women aged 50 to 69 years peaking in the 2001-2002 screening period (57 per 100 females) and falling significantly to 56% in the 2003-2004 period. Since then, the rate increased again to 57%, with the difference statistically significant.

For all women aged 40 years and over, over 1.2 million participated in the BreastScreen Australia Program in 1996-1997 and this increased by 31% (to over 1.6 million) by 2005-2006. Much of this increase was seen in the earlier screening periods. In particular, between the 1996-1997 and 2001-2002 period, the number of women screened increased by 30%. Between the 2001-2002 period and 2005-2006, there was a 1% increase. When the age-standardised rates are considered, the data indicate that 33 out of 100 women (i.e. 33%) aged 40 years and over had a screening mammogram in the 1996-1997 period and this increased over the following periods, reaching 38% in the 2001-2002 period. The participation rate fell significantly over each of the following screening periods and, in 2005-2006, was down to 34%. This pattern differs from that observed for women in the target age group.

Table 7.2: Participation in the BreastScreen Australia Program, females, 1996–1997 to 2005–2006^(a)

Screening period ^(a)	Aged 50–69 years			Aged 40+ years		
	Number of females	ASR ^(b)	95% confidence interval	Number of females	ASR ^(b)	95% confidence interval
1996–1997	844,444	51.4	51.3–51.5	1,239,911	33.1	33.0–33.2
1997–1998	926,932	54.6	54.5–54.7	1,375,348	35.7	35.6–35.7
1998–1999	975,309	55.6	55.5–55.8	1,451,549	36.6	36.5–36.7
1999–2000	1,011,322	55.9	55.8–56.0	1,495,675	36.7	36.7–36.8
2000–2001	1,063,373	56.9	56.8–57.0	1,566,909	37.4	37.4–37.5
2001–2002	1,101,782	57.1	57.0–57.2	1,610,885	37.5	37.4–37.6
2002–2003	1,118,007	56.1	56.0–56.2	1,617,960	36.7	36.7–36.8
2003–2004	1,144,283	55.7	55.6–55.8	1,627,014	36.1	36.0–36.1
2004–2005	1,188,380	56.1	56.0–56.2	1,614,532	34.9	34.9–35.0
2005–2006	1,241,796	56.9	56.8–57.0	1,622,481	34.2	34.2–34.3

(a) The screening periods cover 1 January of the initial year to 31 December of the latter year indicated.

(b) Rates were calculated as the number of females screened as a proportion of the average of the ABS estimated resident population in the respective 2-year period and standardised to the Australian population as at 30 June 2001. They are expressed per 100 females (i.e. as a percentage).

Source: AIHW analysis of BreastScreen Australia data.

Differences across groups

Women in various subgroups may experience a range of barriers—including geographical, language and/or cultural barriers—to accessing screening mammography. Thus, differences in participation in the BreastScreen Australia Program by geographical area, socioeconomic status, Aboriginal and Torres Strait Islander status and main language spoken at home are considered in this section. Note that one of the aims of the BreastScreen Australia Program is to ensure equitable access to the program for all women in the target population.

Differences by geographical area

The number of women who had a screening mammogram in each state and territory through the BreastScreen Australia Program in the 2005–2006 screening period is shown in Table 7.3, as is the age-standardised rate of participation expressed per 100 women. Note that these data relate to the state or territory in which the screening mammography was undertaken; in some cases, this may differ from the state or territory of the woman's usual residence. Due to this fact—as well as differences between the states and territories in terms of population characteristics, geographical structure, program structure and other factors—caution must be undertaken when considering the results.

For those aged 50 to 69 years, women in South Australia were significantly more likely than other women to have participated in the BreastScreen Australia Program in the 2005–2006 period (59%), while women in the Northern Territory were significantly less likely to have done so (41%). This relatively low rate may be at least partly due to the fact that BreastScreen Australia services are not provided in some remote areas of the Northern Territory.

When all women are considered, the data indicate that women in Queensland were significantly more likely than other women to have participated in the BreastScreen

Australia Program (42% of women aged 40 years and over). The second highest participation rate was evidenced by Tasmania (40%). On the other hand, women in the Northern Territory were significantly less likely than other women to have participated in the program (24%).

Table 7.3: Participation in the BreastScreen Australia Program by state and territory^(a), females, 2005–2006^(b)

State or territory	Aged 50–69 years			Aged 40+ years		
	Number of females	ASR ^(c)	95% confidence interval	Number of females	ASR ^(c)	95% confidence interval
New South Wales	402,543	55.9	55.8–56.1	468,729	29.7	29.6–29.8
Victoria	306,885	57.0	56.8–57.2	397,881	33.9	33.8–34.0
Queensland	246,913	58.0	57.7–58.2	385,437	42.4	42.3–42.6
Western Australia	121,709	57.3	57.0–57.7	157,351	34.1	33.9–34.3
South Australia	105,149	59.0	58.6–59.3	134,432	34.7	34.5–34.9
Tasmania	32,753	57.1	56.5–57.7	48,746	40.1	39.7–40.5
Australian Capital Territory	19,328	56.8	56.0–57.7	21,664	29.4	29.0–29.8
Northern Territory ^(d)	6,516	41.3	40.3–42.4	8,241	23.6	23.0–24.1
Total	1,241,796	56.9	56.8–57.0	1,622,481	34.2	34.2–34.3

(a) Relates to the state or territory in which the screening mammography was undertaken.

(b) Period covers 1 January 2005 to 31 December 2006.

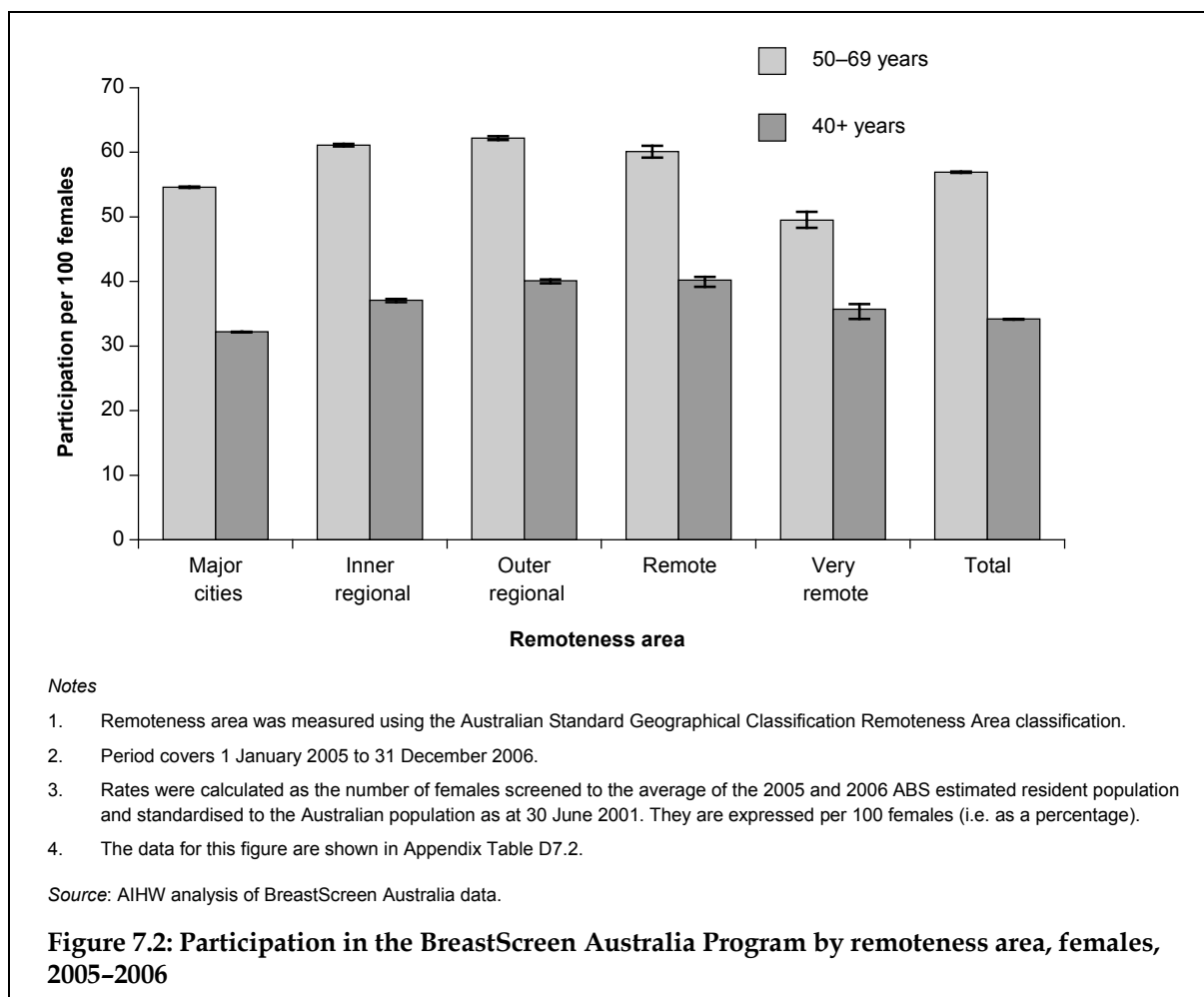
(c) Rates were calculated as the number of females screened to the average of the 2005 and 2006 ABS estimated resident population and standardised to the Australian population as at 30 June 2001. They are expressed per 100 females (i.e. as a percentage).

(d) BreastScreen Australia services are not provided in some remote areas of the Northern Territory; this may have affected the rate for Northern Territory.

Source: AIHW analysis of BreastScreen Australia data.

Participation in the BreastScreen Australia Program according to the remoteness status of the woman's usual residence is shown in Figure 7.2. For women aged 50 to 69 years, women living in *Outer regional* areas were significantly more likely than other women to have had a screening mammogram (62% participation rate) in the 2005–2006 period. Participation was 61% for women who lived in *Inner regional* areas and 60% for those in *Remote* areas. Meanwhile, women in the target age group who lived in *Very remote* areas had a significantly lower participation rate of 50%, with participation also significantly lower than average for those who lived in *Major cities* (55%).

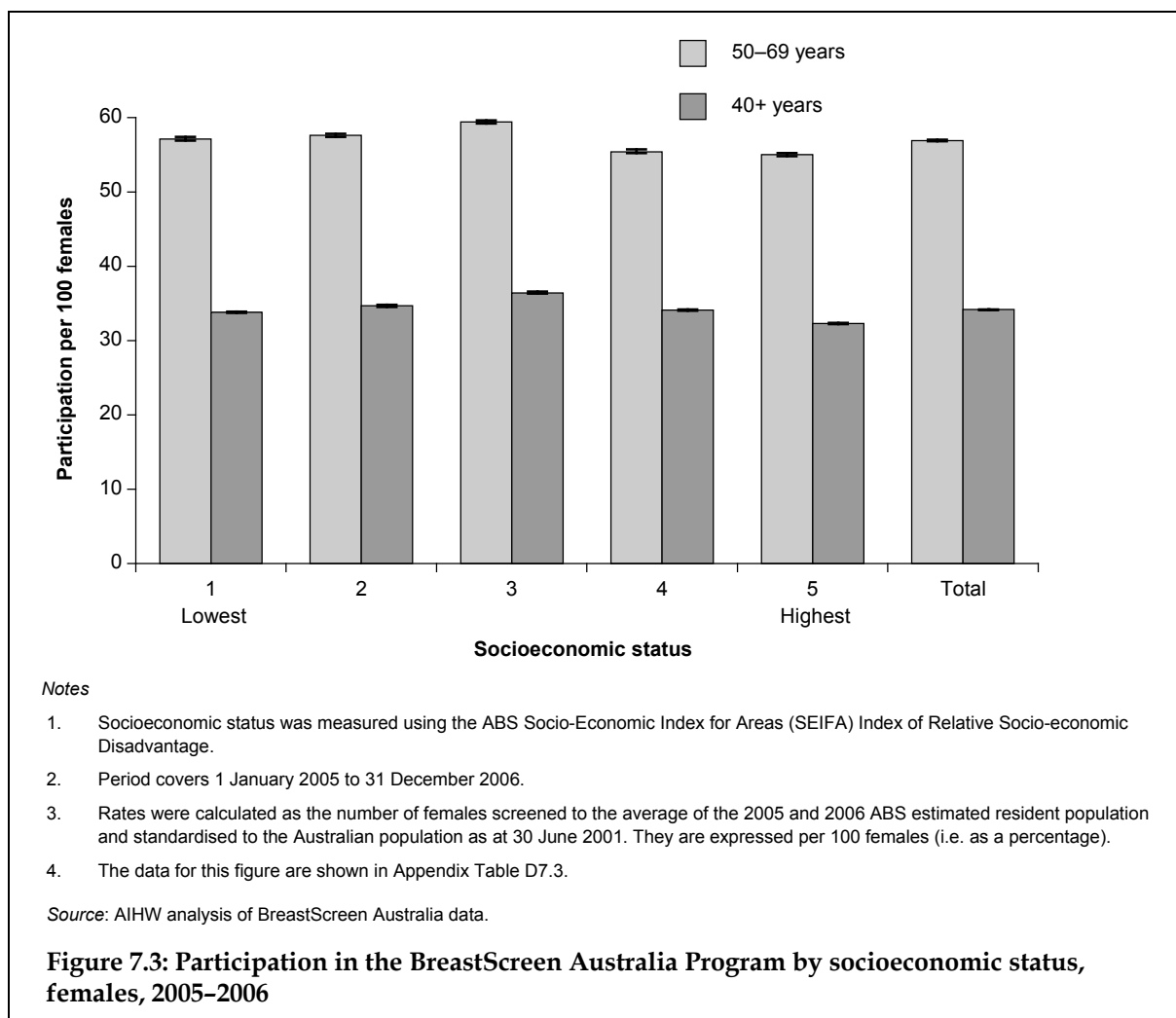
Considering all women who had a screening mammogram through the program, the highest participation rates were observed for women who lived in *Remote* and in *Outer regional* areas (40% for both groups, which was significantly higher than that for women living in other areas). In contrast, those living in *Major cities* were significantly less likely than women from other areas to have been screened through the BreastScreen Australia Program (32%).



Differences by socioeconomic status

Participation in the BreastScreen Australia Program according to socioeconomic status is shown in Figure 7.3. As discussed in Chapter 2, the measure of socioeconomic status pertains to the area in which the women lived. For those women in the target age range of 50 to 69 years, the participation rate in the 2005-2006 period was significantly higher for women in the middle socioeconomic status group (59%) compared with women in the other groups, while participation rates were lowest, and significantly so, for those women in the two highest socioeconomic status groups (55% for both groups).

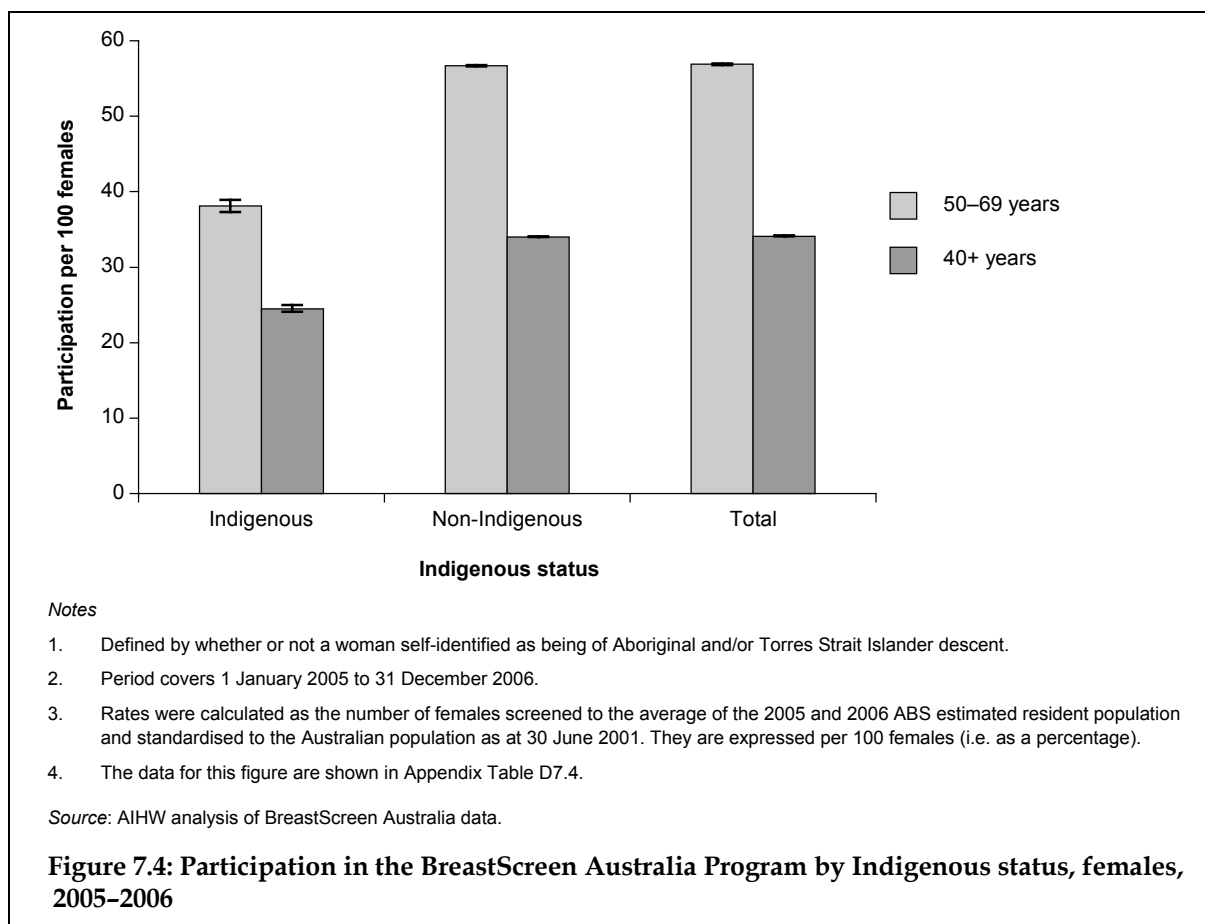
In regard to all women who participated in the program, women in the middle socioeconomic status group were significantly more likely than other women to have had a screening mammogram through the BreastScreen Australia Program (36%). On the other hand, those in the highest socioeconomic status group were significantly less likely than other women to have participated (32%), followed by those in the lowest socioeconomic status group (34%).



Differences by Aboriginal and Torres Strait Islander status

Women who attend for a screening mammogram are asked to indicate if they are of Aboriginal and/or Torres Strait Islander descent. Among all participants in the 2005-2006 period, 1% identified as Indigenous, 1% did not provide an answer to this question and the remainder identified as non-Indigenous. Note, however, that some jurisdictions automatically code cases with missing information to the non-Indigenous category. Therefore, it is likely that some Indigenous women were incorrectly assigned to the non-Indigenous category. This means that the analysis based on Indigenous status should be interpreted with caution.

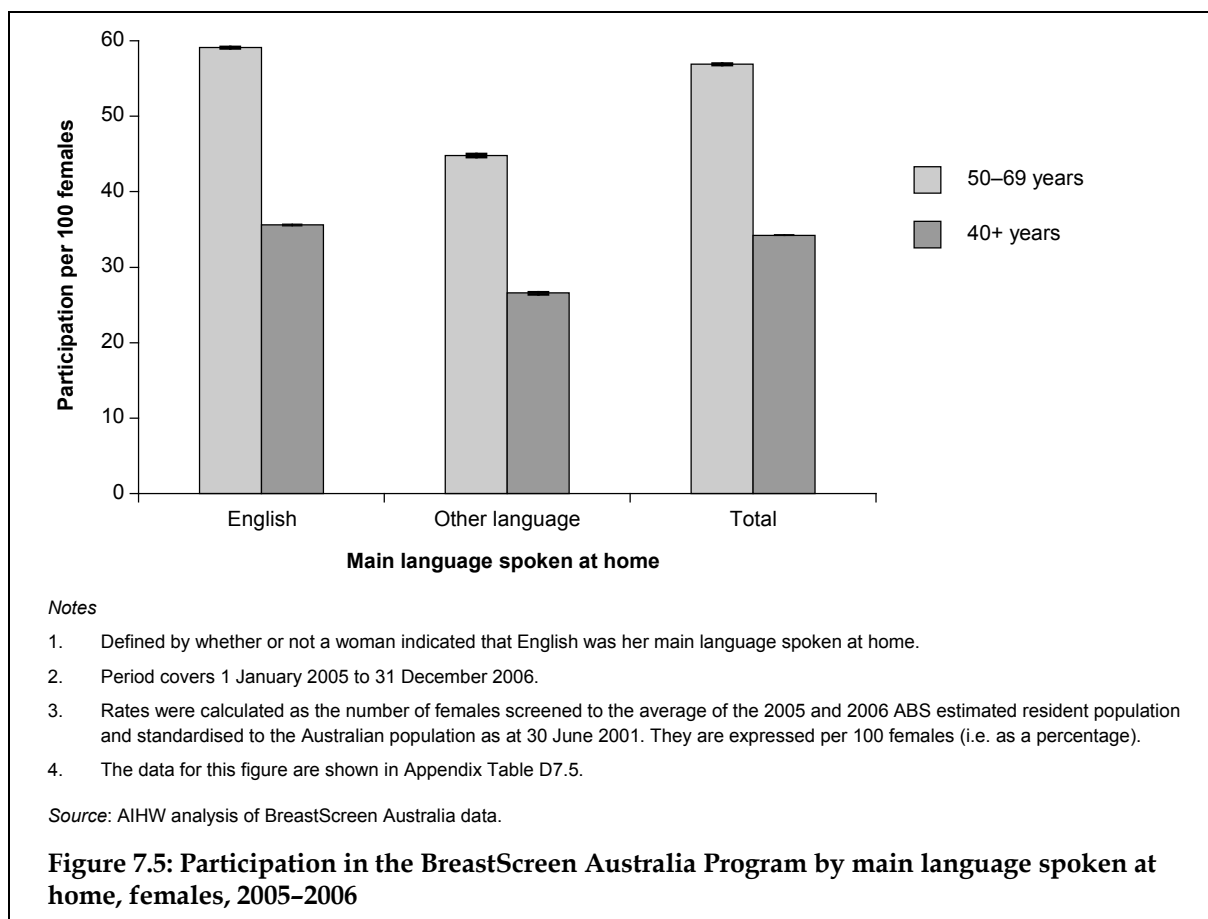
Non-Indigenous women were significantly more likely to have had a mammogram through the BreastScreen Australia Program than were Indigenous women (Figure 7.4). Specifically, the age-standardised participation rate for non-Indigenous women aged 50 to 69 years was 57% compared with 38% for Indigenous women in that age range. Likewise, for women aged 40 years and above, there was also a significant difference by Indigenous status in participation rates (34% for non-Indigenous women compared with 25% for Indigenous women).



Differences by main language spoken at home

Women who participate in the BreastScreen Australia Program are also asked about the main language they speak at home. The majority (86%) of women who had a screening mammography in the 2005-2006 period indicated that English was the main language they spoke at home, while 13% said it was a language other than English, and this information was missing for 0.4% of women. Note, however, that some jurisdictions do not include the 'Not stated' category and there may be differences in how these data are collected. Hence, the analysis based upon main language spoken at home should be interpreted with caution.

When age-standardised participation rates were compared, the results indicated that women aged 50 to 69 years who mainly spoke English at home were significantly more likely than other women to have participated in the BreastScreen Australia Program (59% and 45%, respectively) (Figure 7.5). Similarly, a significant difference was observed for women aged 40 years and above, with a participation rate of 36% for women whose main language spoken at home was English, compared with 27% for other women.



Medicare Benefits Schedule-funded mammography

In this section of the report, data are provided on the number of mammograms that were subsidised through the MBS. For women, differences by age and geographical area are considered. Although men are not eligible for screening mammography through the BreastScreen Australia Program, they are eligible for reimbursement for mammograms through the MBS. Hence, data on MBS-funded mammograms are also presented for men. When rates are presented in this section of the report, they are expressed per 1,000 persons (not per 100 persons as in the previous section). The data source was the statistics provided on the Medicare Australia website (Medicare Australia 2009). The latest available annual data are for the financial year of 2007-08, while trend information is available from 1993-94. Further information about this data source can be found in Appendix C.

MBS-funded mammography for females

MBS-funded mammography in 2007-08

The number of mammography services provided to females that were subsidised through the MBS in the 2007-08 financial year is shown in Table 7.4. Over 350,000 MBS-funded mammography services were provided to women in 2007-08, with almost nine out of ten of these services (88%) involving mammograms of both breasts rather than one breast.

Table 7.4: Medicare Benefits Schedule-funded mammography services, females, 2007–08

Service type	Number of Services	Per cent of mammography services	Age-standardised rate ^(a)	95% confidence interval
Mammography of both breasts	313,716	88.5	28.2	28.1–28.3
Mammography of one breast	40,895	11.5	3.5	3.5–3.6
Total mammography	354,611	100.0	31.8	31.7–31.9

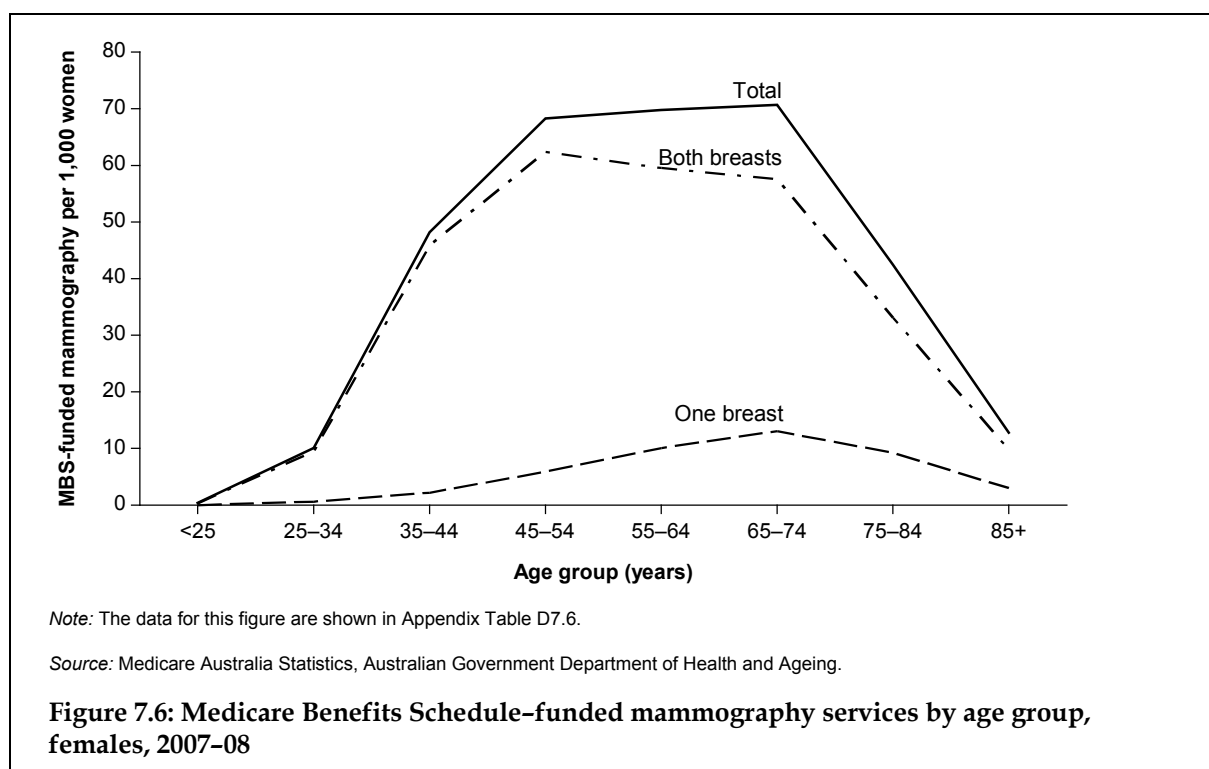
(a) Standardised to the Australian population as at 30 June 2001 and expressed per 1,000 females.

Source: Medicare Australia Statistics, Australian Government Department of Health and Ageing.

The total number of MBS-funded services for all types of services provided to females in the 2007–08 financial year was 163,309,173 (Medicare Australia 2009). Thus, mammographic services represented 0.2% of all services to females subsidised by MBS in that year. The age-standardised rate indicates that 32 per 1,000 women had an MBS-funded mammogram in 2007–08.

Differences by age

Differences by age in the rate of MBS-funded mammography services in 2007–08 are shown in Figure 7.6. Women aged 65 to 74 years (71 per 1,000 women) and those aged 55 to 64 years (70 per 1,000) were significantly more likely than women in the other age groups to have had an MBS-funded mammogram. When the rates for those who had a mammogram of one breast versus both breasts are considered, the patterns by age differ. In particular, of all the age groups, those aged 45 to 54 years had the highest rate of mammography of both breasts (62 per 1,000 women); the corresponding group who had the highest rate of mammography of one breast was those aged 65 to 74 years (13 per 1,000).

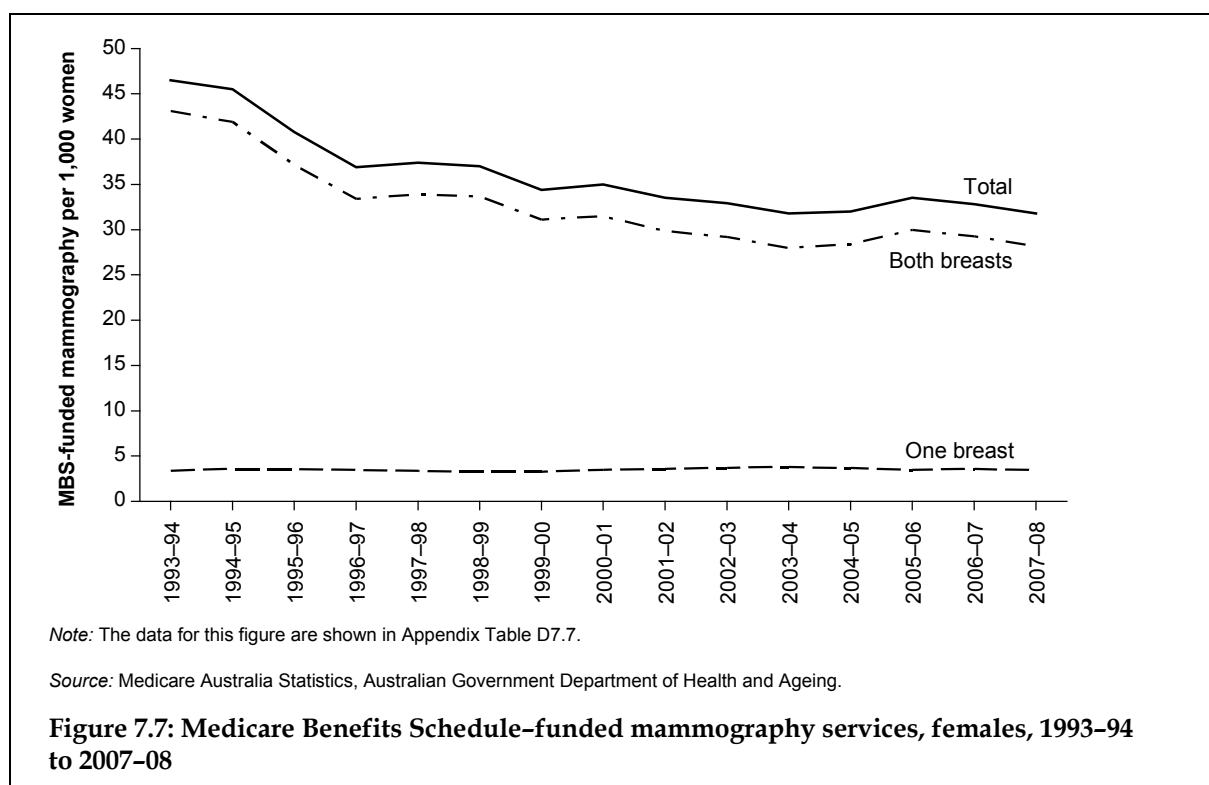


Trends

The number of MBS-funded mammograms provided to women fell from 385,108 in 1993–94 to 354,611 in 2007–08, which is a decrease of 8% (Appendix Table D7.7).

Trends in the age-standardised rates of MBS-funded mammography are illustrated in Figure 7.7. While, overall, there has been a downward trend in the rate of women having MBS-funded mammograms, the sharpest decrease occurred between 1994–95 and 1996–97 (46 to 37 per 1,000 women, respectively). This decrease in the mid-1990s could be related to the greater availability of mammography services through the BreastScreen Australia Program as this program continued to extend across more regions of Australia.

All of the decrease in the rate of women having MBS-funded mammograms pertained to mammograms of both breasts, with the rate of women having an MBS-funded mammogram of one breast virtually stable (ranging from 3 to 4 per 1,000 women over the time period considered).



Differences by geographical area

Information on the provision of MBS-funded mammography services is available according to the state or territory in which the person lived at the time of claiming for the service.

As shown in Table 7.5, of all of MBS-funded mammography services provided to women, 39% were provided to women living in New South Wales and 25% were provided to women in Victoria. The age-standardised rates indicate that a significantly higher proportion of women in New South Wales had an MBS-funded mammography service in 2007–08 (38 services per 1,000 women). Meanwhile, a significantly lower proportion of women in the Northern Territory did so (15 per 1,000). Note that the observed differences by states and

territories may relate to different jurisdictional practices in regard to who provides mammography services.

Table 7.5: Medicare Benefits Schedule-funded mammography services by state and territory, females, 2007-08

State or territory	Number of services	Age-standardised rate ^(a)	95% confidence interval
New South Wales	138,955	37.9	37.7–38.1
Victoria	87,298	31.4	31.1–31.6
Queensland	64,519	29.4	29.2–29.7
Western Australia	24,463	22.3	22.0–22.6
South Australia	26,348	30.3	29.9–30.6
Tasmania	6,785	24.6	24.1–25.2
Australian Capital Territory	4,903	28.4	27.6–29.2
Northern Territory	1,340	14.8	13.9–15.7
Total	354,611	31.8	31.7–31.9

(a) Standardised to the Australian population as at 30 June 2001 and expressed per 1,000 females.

Source: Medicare Australia Statistics, Australian Government Department of Health and Ageing.

MBS-funded mammography for males

Men are also eligible for MBS-funded mammography services, with 749 such services provided to males in 2007-08 (Table 7.6.). An additional 539 services were provided to persons for whom the sex of the recipient was not recorded. Thus, in total, 355,899 MBS-funded mammography services were provided in 2007-08.

Table 7.6: Medicare Benefits Schedule-funded mammography services by sex, 2007-08

	Mammography of both breasts		Mammography of one breast		Total mammography	
	Number of services	Per cent	Number of services	Per cent	Number of services	Per cent
Males	592	0.2	157	0.4	749	0.2
Females	313,716	99.7	40,895	99.3	354,611	99.6
Unknown	407	0.1	132	0.3	539	0.2
Total	314,715	100.0	41,184	100.0	355,899	100.0

Source: Medicare Australia Statistics, Australian Government Department of Health and Ageing.