
Statistical REPORT

BreastScreen **SOUTH AUSTRALIA**

A joint Commonwealth/State and Territory Program

BreastScreen SA

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Report Summary

This is the second statistical report produced by BreastScreen SA, the South Australian component of the national breast cancer screening program, BreastScreen Australia.

This report provides screening profiles and summary data on women who attended BreastScreen SA for screening mammography during 1998 and those who were assessed for screen detected breast abnormalities.

The 1998 Statistical Report reflects the commitment of BreastScreen SA to monitor the quality and outcomes of the program and the valuable service provided to the women of South Australia.

Acknowledgements

Sincere thanks to all BreastScreen SA staff for their commitment and motivation to ensure that BreastScreen SA provides a quality service to the women of South Australia.

The production of this report has been made possible by the cooperation and support of many people. Special thanks to the staff of the Monitoring and Evaluation Unit for their input, and to the many staff involved in the consultative process to achieve the final product. These included:

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Thanks also to Associate Professor David Roder, Director, Epidemiology Branch, Department of Human Services.

The women and staff whose photos appear in this report are most gratefully acknowledged.

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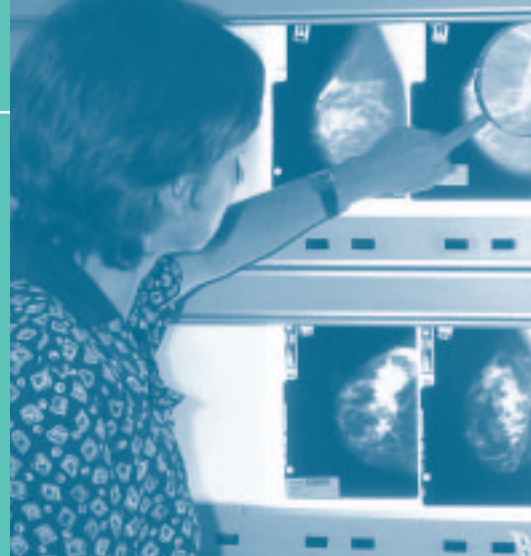
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DESCRIPTION *of* BREASTSCREEN SA



1.1 *Introduction*

BreastScreen SA, formerly known as the SA Breast X-Ray Service, is the South Australian component of BreastScreen Australia, the national breast cancer screening program. The program is a part of the Statewide Division of the SA Department of Human Services.

The state program began as a pilot screening project in 1988, and in February 1991, was the first to sign an agreement with the Commonwealth to participate in the National Program for the Early Detection of Breast Cancer (now known as BreastScreen Australia).

The aim of BreastScreen SA is to reduce mortality and morbidity from breast cancer, by providing a free government screening mammography service on a statewide basis. Asymptomatic women aged 40 years and over are eligible to attend. However, the service seeks primarily to screen women aged 50 to 69 years.

In March 1994, BreastScreen SA was the first service in Australia to achieve full accreditation in the national program. In April 1997, the service was the first to be fully re-accredited. National Accreditation Requirements are comprehensive and apply to recruitment, screening and assessment services, follow-up of women with diagnosed breast cancer, technical quality assurance, education and counselling, consumer satisfaction, data management, service management and training.¹

Compliance with National Accreditation Requirements is critical to maintain the high standards necessary to achieve the aim of the program. It also sends to clients a very positive endorsement of the quality of the service. Past and present staff of BreastScreen SA are credited with establishing the high quality program in South Australia.

1.2 *Service provision in 1998*

BreastScreen SA has a single, centrally located State Coordination Unit (SCU) at Wayville, responsible for managing and coordinating the statewide screening service. The SCU determines the service delivery structure and processes dedicated to mammography screening and assessment.

The SCU has a central booking system for screening appointments, and provides confidential storage of client records. Recruitment strategies are generated from within the SCU, as are corporate publications and research.

¹ March 2000: BreastScreen SA was re-accredited for a third time.



Screening is provided through dedicated and accredited screening clinics. There are six fixed screening clinics in metropolitan Adelaide, and one part-time clinic located in the Riverland. Rural and remote women, for whom lack of transport may prevent participation in screening, are served by two mobile x-ray units, which visit 26 country regions every two years, the recommended screening interval (see Figures 1.1 and 1.2).²

A central assessment clinic at Wayville caters for the investigations of the screen-detected abnormalities which occur in approximately 3% of all women who attend for routine screening.

Figure 1.1 BreastScreen SA service provision in 1998*

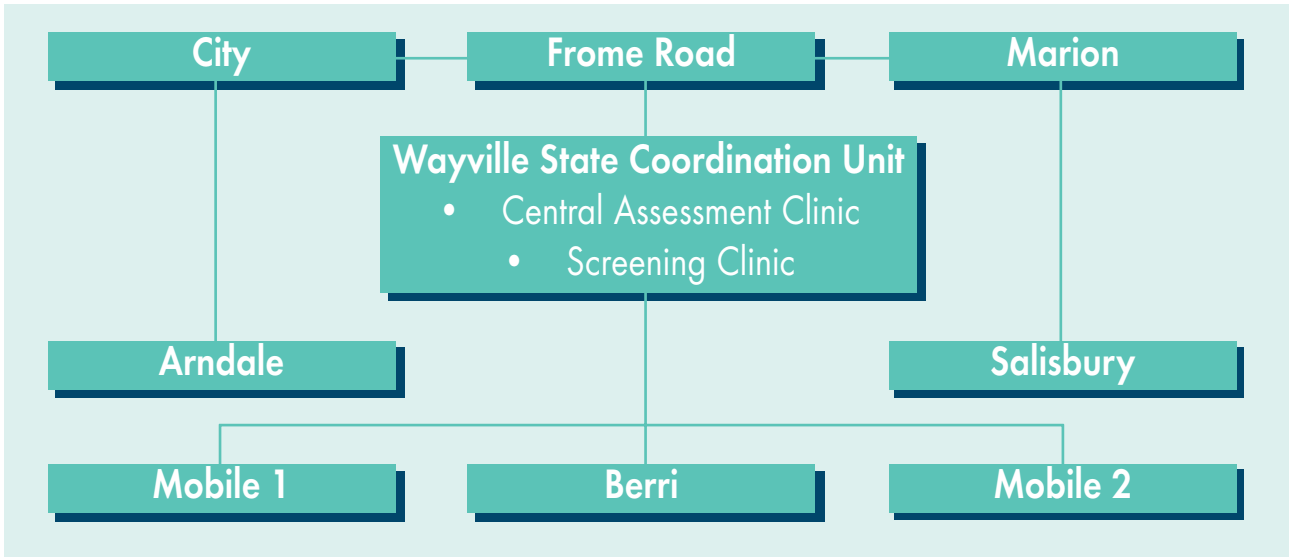
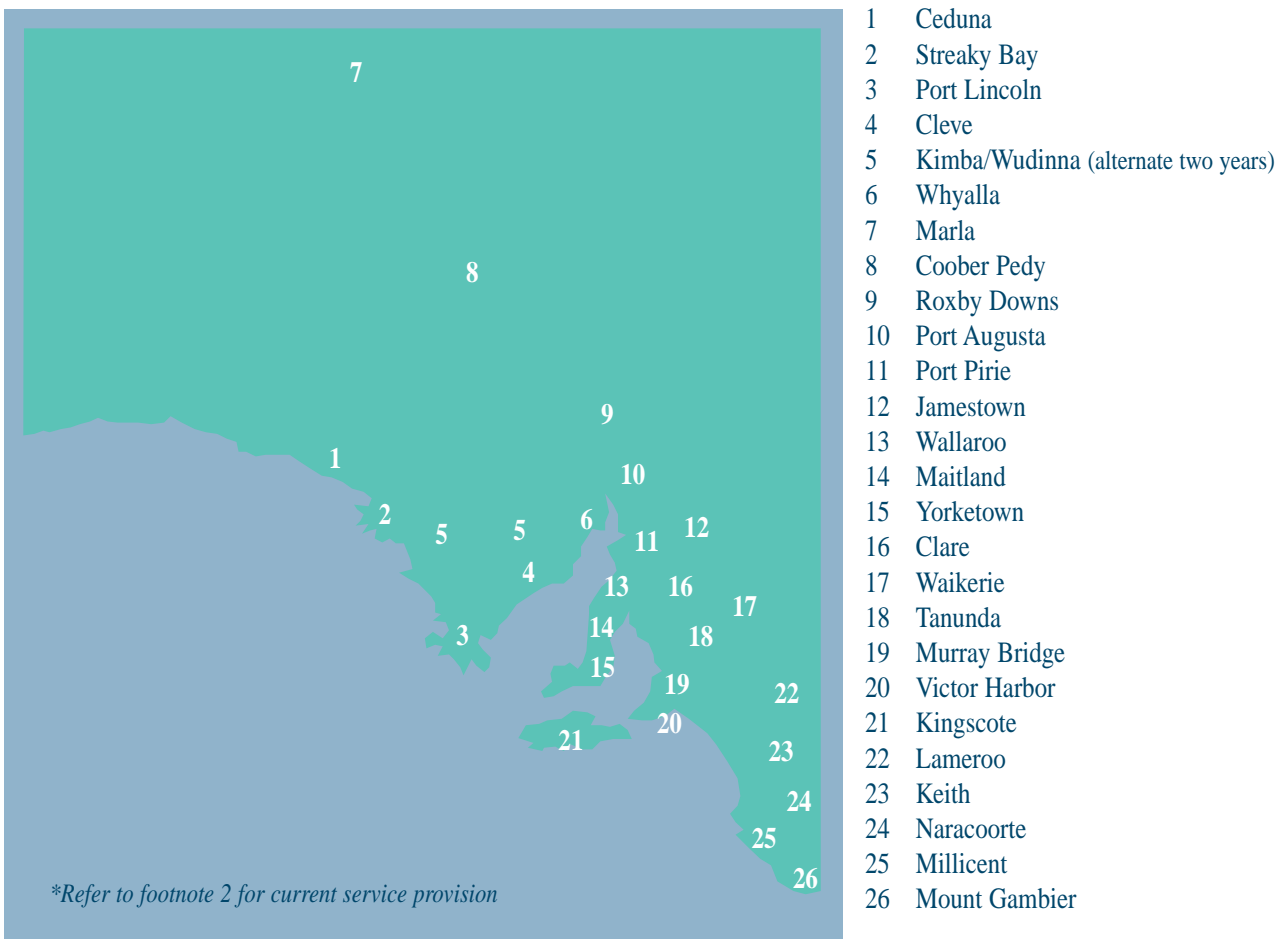


Figure 1.2 BreastScreen SA mobile unit locations in 1998*



² Feb 2000: Mobile Unit 3 introduced. April 2001: Screening at the Riverland clinic ceases, and replaced by annual mobile unit visits.

1.3 Screening and the target population

Screening is the process of looking for disease in healthy people without symptoms. A screening mammogram is simply a breast x-ray. It is currently the most effective method for detecting breast cancers that are non-palpable (too small to be felt). Early detection is the key to simpler treatment and it may save a woman's life.

Screening is primarily recommended for women aged 50 to 69, who are commonly referred to as the "target group". It is estimated that for individual women in this age group, having a screening mammogram *every two years* reduces the chance of dying from breast cancer by up to 40%.^{3,4,5} BreastScreen SA re-invites women in the target group when their next mammogram is due.

Research results are less clear about the benefits of screening mammograms for women aged 40 to 49 and over 70. Therefore, while BreastScreen SA does not actively recruit women in these age groups to the screening program, they are eligible for screening, and are very welcome to phone for an appointment if they wish to attend. Existing clients in their forties are re-invited when their next mammogram is due. All women aged 70 and over are provided with a reminder card indicating when their next mammogram is due. Additional information about the benefits of screening in these age groups is provided at that time.



In line with national policy, BreastScreen SA does not screen women under 40 years of age. There is no evidence to suggest that routine screening mammograms for this age group would reduce the number of deaths from breast cancer.

The majority of BreastScreen SA clients are eligible for screening every two years. Women who meet BreastScreen SA's criteria for a strong family history of breast cancer are eligible for a screening mammogram every year. A woman is said to have a strong family history if she has one of the following characteristics:

- A first-degree relative (mother/sister/daughter, father/brother/son) with breast cancer diagnosed before the age of 50.
- A first-degree relative with cancer in both breasts (diagnosed at any age).
- Two or more first-degree relatives with breast cancer (diagnosed at any age).

Women with a personal history of breast cancer are also eligible for annual screening at BreastScreen SA if they were diagnosed more than 10 years ago and are no longer seeing their specialist. They are also encouraged to see their general practitioner for an annual clinical breast examination.

BreastScreen SA is planned and funded to achieve a high level of participation of women, in order to reduce death rates and morbidity in the population. The aim is to screen 70% of women aged 50 to 69 every two years.

³ Duffy SW, Tabar L, Fagerberg G, Gad A, Grontoft O, South MC and Day NE (1991). Breast Screening, prognostic facts and survival - results from the Swedish Two-County Study. *British Journal of Cancer*; 64, 1133-38.

⁴ Fletcher SW, Black W, Harris R, Rimer V, Shapiro S. Report of The International Workshop on Screening for Breast Cancer (1993). *J Natl Cancer Inst*; 85(20): 1644-56.

⁵ Feig SA. Decreased breast cancer mortality through mammographic screening: results in clinical trials (1998). *Radiology*; 167, 659-65.



1.4 Recruitment strategies

BreastScreen SA recruitment strategies are directed at the South Australian community of women aged over 40 years, particularly those aged 50 to 69. This broad group may be separated into smaller and more specific sub-groups of women, including those:

- residing in metropolitan locations;
- residing in rural and remote locations;
- from culturally and linguistically diverse (CALD) backgrounds, and
- of Indigenous (Aboriginal and Torres Strait Islander) descent.

BreastScreen SA works with other groups in the community who may influence women, including health care professionals (general practitioners, community health workers and women's health workers) and the South Australian media.

A variety of strategies are employed to inform women about the screening program, and to recruit them for a regular mammogram every two years. Some recruitment strategies are appropriate for all audiences, while more specific strategies may be required for groups with special needs.

Information from the Electoral Roll provides the name, date of birth and postal address of women in the target group, and constitutes BreastScreen SA's most effective mechanism for personalised recruitment. The Electoral Commission has granted permission to use this information for recruitment purposes only.

Broad strategies to promote screening include advocating through existing women's networks, and providing speakers for information sessions and public meetings. Placing publicity and advertising in the South Australian metropolitan and rural media successfully communicates the screening message to a large audience.

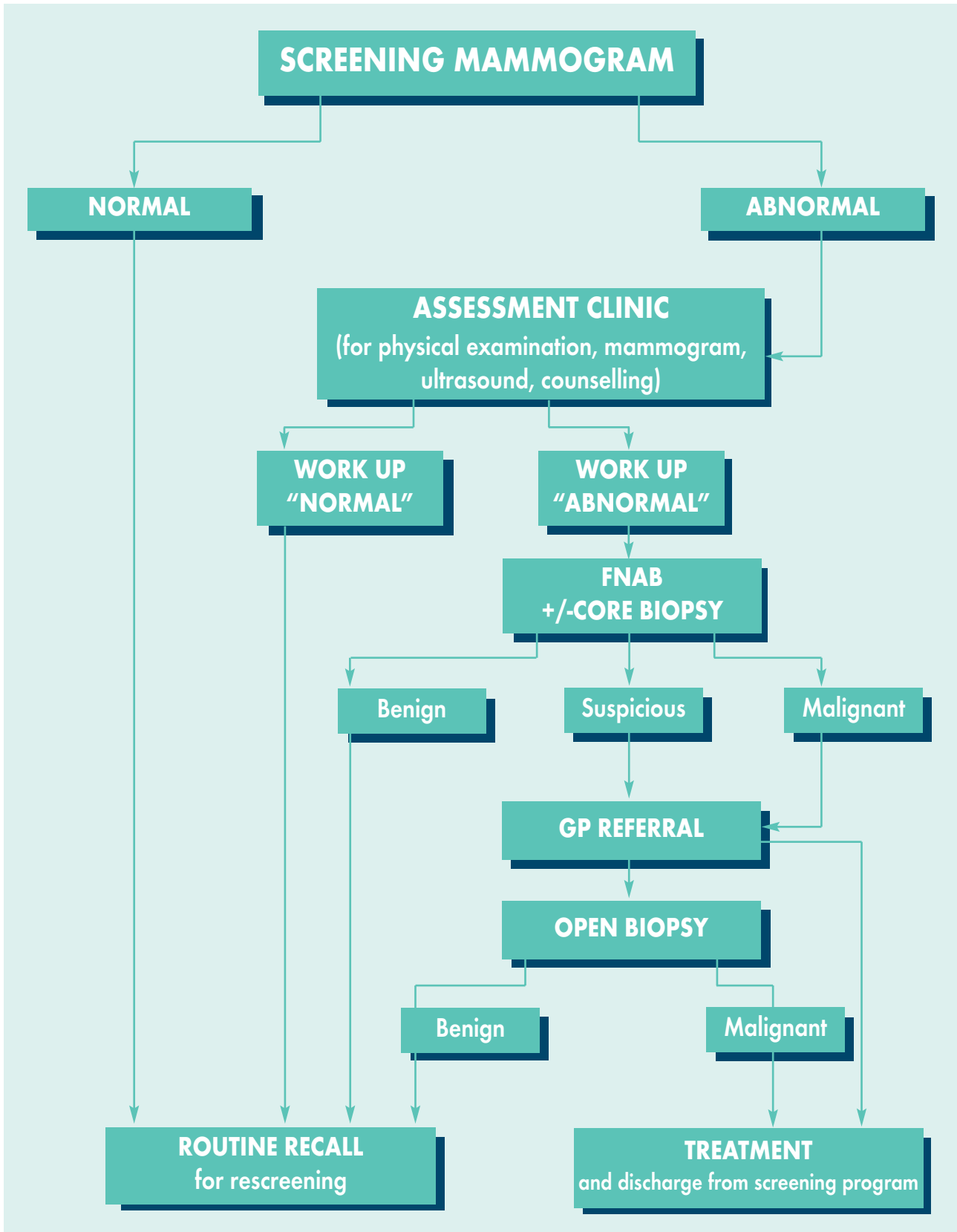
BreastScreen SA also provides information to health professionals, especially general practitioners, via seminars, a Clinical Audit Activity, practice visits and printed resources. Although women do not require a doctor's referral to attend the screening program, research has shown that women are motivated to attend for regular screening if it is recommended by their general practitioner. Therefore, building collaborative partnerships with general practitioners is an important strategy for BreastScreen SA.

To improve access and equity for CALD women, free printed information is available in a variety of languages, advertising is placed in local ethnic media, and free community educators from a range of cultural backgrounds are also provided.

Aboriginal women from the Pitjantjatjara Lands have access to the screening service when a mobile unit visits Marla every two years. BreastScreen SA also collaborates with community groups and health workers to organise bus transport for groups of rural and metropolitan women who do not have access to transport.



Figure 1.3 The screening and assessment pathway



1.5 Screening and assessment pathway

1.5.1 Screening

Free services provided by BreastScreen SA include routine screening mammography and assessment of all screen-detected abnormalities. Continuity of care is provided at all stages of the screening and assessment pathway.

The screening process involves:

- systematic recruitment of asymptomatic women aged 50 to 69. Women with breast symptoms are advised to see their general practitioners for further investigation.
- high quality, two-view mammography by specially trained radiographers.
- independent film reading by two radiologists specially trained in mammography. Discordant calls are read by a third radiologist.
- written notification of results within two weeks to all women and their nominated general practitioners.
- routine recall of women every two years (women with a strong family history of breast cancer, or a personal history of breast cancer more than 10 years ago, are eligible for annual screening).

1.5.2 Assessment

Approximately 3% of women have a screen-detected abnormality. They are contacted by a nurse counsellor to arrange an appointment to attend the Wayville Assessment Clinic. Free Assessment Clinics are conducted each Tuesday, Wednesday and Thursday. Women from rural areas may be asked to return to the mobile unit for further mammographic examination. A few will also need to attend the Assessment Clinic in Adelaide.

An experienced multidisciplinary assessment team consisting of a radiographer, medical officer, nurse counsellor, radiologist, pathologist and surgeon, provides clients with the best possible care.



BreastScreen SA uses the internationally accepted triple assessment process, which involves imaging, clinical assessment and pathology. The Assessment Clinic is undertaken in two levels. All women attend Level 1 Assessment, which is conducted during the morning.

Procedures undertaken include:

- further mammography;
- ultrasound, and
- clinical breast examination by a medical officer.

Level 2 Assessment, held in the afternoon, is for those women whose further imaging and/or clinical examination indicate a suspicious finding. The radiological grading is discussed with the pathologist and surgeon, and the following investigations are provided:

- fine needle aspiration biopsy (FNAB) - either by palpation, or guided by ultrasound or stereotactic mammographic control, and
- core biopsy - by ultrasound, or stereotactic guidance.



A pathologist is on-site so that FNAB results are available on the same day, while core biopsy results are available within 24 hours.

If a lesion is non-palpable, it may be localised (using carbon or a metal clip) to assist the treating surgeon in finding the lesion. These localisations are performed using ultrasound or stereotactic guidance.

Members of the medical team counsel women through the assessment process, and provide answers to their questions. Women are generally informed of their results on the same day, and have the opportunity to discuss them fully with the medical team before leaving the clinic.

Following assessment, the medical team may recommend to some women that open biopsy is required to obtain a histological diagnosis of a suspicious mammographic lesion. Open biopsy is not included as part of the BreastScreen SA program.

Other women will require treatment for breast cancer that is confirmed by cytology or core biopsy at the Assessment Clinic. In each case, the woman's general practitioner is contacted and advised of the recommendations. An appointment is made for the woman to see her general practitioner, to discuss further arrangements and referral to the surgeon of her choice.

Approximately three-quarters of the women who attend for assessment will be reassured that they do not have breast cancer, and will be re-invited to the program when their next screening mammogram is due.

The screening and assessment pathway (Figure 1.3) illustrates the steps a woman may undergo at BreastScreen SA.

1.6 *Quality assurance and training*

1.6.1 **Quality assurance (QA)**

Service performance at BreastScreen SA is continually subjected to intensive quality control and audit processes, to ensure that the program complies with the stringent quality standards of the National Accreditation Requirements.

Monthly meetings of the multidisciplinary clinical team are held to review all cases of special interest. For cases proceeding to open biopsy and treatment, comprehensive information regarding the findings is collected prior to a triple audit process, carried out by the team of coordinators representing radiology, pathology and surgery. The cooperation of each medical discipline in the QA audit process is of the utmost importance to achieve optimal results.

The Screening Support and Evaluation Unit also undertakes extensive QA activities to ensure accuracy of data entry. A proportion (20%) of client information and screening data entry is checked, while 100% of assessment and treatment data are subjected to quality assurance.

Stringent checks are carried out by the Screening Support, Clinical, and Monitoring and Evaluation Teams to ensure that all women and their nominated general practitioners receive the correct results letters, and those who require further investigation are recalled. Regular monitoring of the database is undertaken to make certain that there are no inconsistencies or missing data.



1.6.2 Training

The Monitoring and Evaluation Team provides regular statistics to management and clinical staff. These are used to monitor program and individual performance, and for QA and training purposes.

Radiology, pathology and surgical staff regularly meet in their respective groups to peer review their work. Peer review promotes skill development and a better understanding of breast cancer.

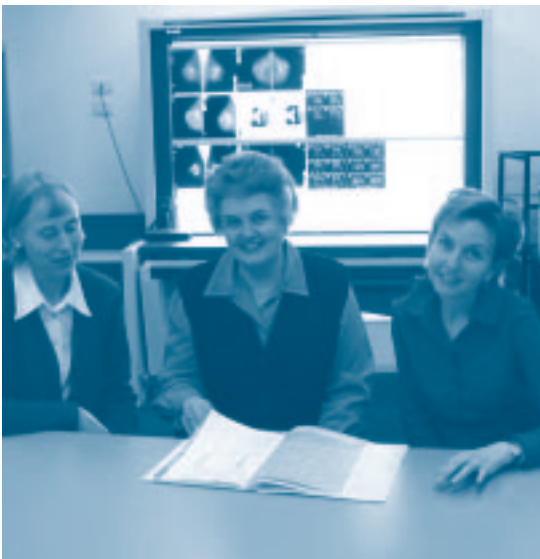
To provide on-going education for radiological staff, the Clinical Director ensures that all cases investigated at the Assessment Clinic are available for weekly review. The Clinical Director also provides a comprehensive training program for radiology registrars. This involves one week of on-site instruction, and double-reading with expert BreastScreen SA radiologists.

Radiographer training is provided by experienced BreastScreen SA tutors at the Frome Road Screening and Training Clinic, a joint initiative of BreastScreen SA and the University of South Australia. The clinic offers academic and clinical instruction to post-graduate radiographers in this specialist area of radiography - a "first" in mammography training in Australia. It also serves as a part-time screening clinic.

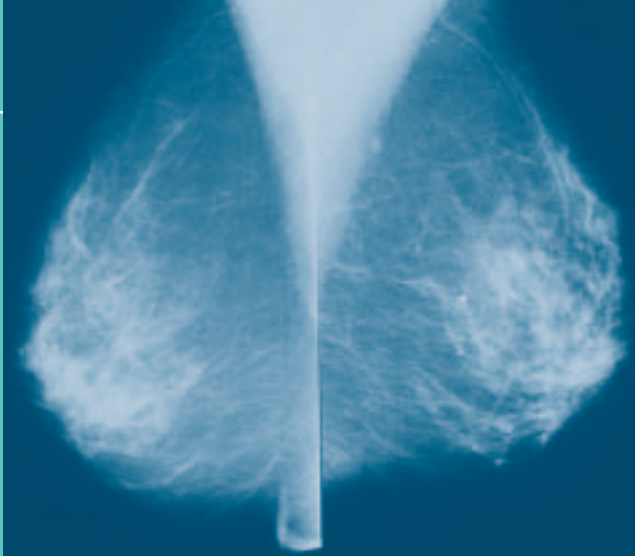
The training program caters for radiographers within BreastScreen SA, and attracts participants from interstate and overseas. The South Australian training model has been adopted by interstate screening programs.

Administrative staff are encouraged to develop their skills and knowledge in all screening support functions. Both internal and external training is offered, and regular performance feedback is provided. Monthly meetings provide an effective forum for team building and problem resolution.

Three professional development days for all staff are held each year, to foster a strong team culture within the organisation, and provide training and development opportunities. Presentations are made by staff, visiting medical specialists and invited speakers, on a broad range of topics.



1998 STATISTICAL REPORT



2.1 Summary

Attendance

There were 60,111 screens performed at BreastScreen SA during 1998, the highest number of annual screens since the program began in 1989. Women in the target age group of 50 to 69 years comprised 74% of total screens. Women returning for a subsequent screen comprised 76% of all screens.

Demography

One third of the women screened were born overseas. Twelve percent stated that they usually spoke a language other than English at home, and 0.3% identified themselves as being of Aboriginal or Torres Strait Islander descent. Women in rural and remote areas comprised 22% of screens, which is a higher proportion than the representation of the same group in the 1996 Census (Australian Bureau of Statistics (ABS)).

Participation

In 1998, the participation rate for women aged 50 to 69 was 59.5% over a 24-month period. Indigenous women and women from culturally and linguistically diverse backgrounds participate at a slightly lower rate than that of all participating women.

Recall to assessment

There were 1,547 women recommended for assessment of a screen-detected abnormality in 1998, giving a recall rate of 2.6%. For women attending for a first screen, the recall rate was 3.9%, whereas it was 2.2% for women attending for a subsequent screen.

Assessment procedures

At assessment, women initially underwent further mammography and/or ultrasound. Forty-seven percent of these women had further tests. The most common of these was a fine needle aspiration biopsy (FNAB).

Breast cancers detected

During 1998, BreastScreen SA detected 339 breast cancers. Of these, 79% were invasive and 21% were ductal carcinoma in-situ (DCIS). The cancer detection rate was 59 per 10,000 women at their first screen, and 55.6 per 10,000 for women at subsequent screens.

Small cancers detected

Small invasive breast cancers are defined as 10mm or less in diameter. The BreastScreen Australia National Accreditation Requirements state that the number of small invasive cancers less than or equal to 10mm in diameter should be greater than 8 invasive cancers per 10,000 screens. In 1998, the small cancer detection rate was 14.6 per 10,000 screens.



2.2 Characteristics of women attending for screening

2.2.1 Number of screening mammograms

During 1998, BreastScreen SA provided 60,111 screening mammograms for women aged 40 and over. National Accreditation Requirements state that women aged between 40 and 49 should represent less than or equal to 35% of the total number of women screened and women aged 50 to 69 should represent greater than 60%. During 1998, 10,662 (17.7%) of the total number of women screened were aged between 40 and 49, and 44,565 (74.2%) were aged between 50 and 69 (Table 1). The proportion of women who were aged 70 years and over at the time of screening was 8.1%.

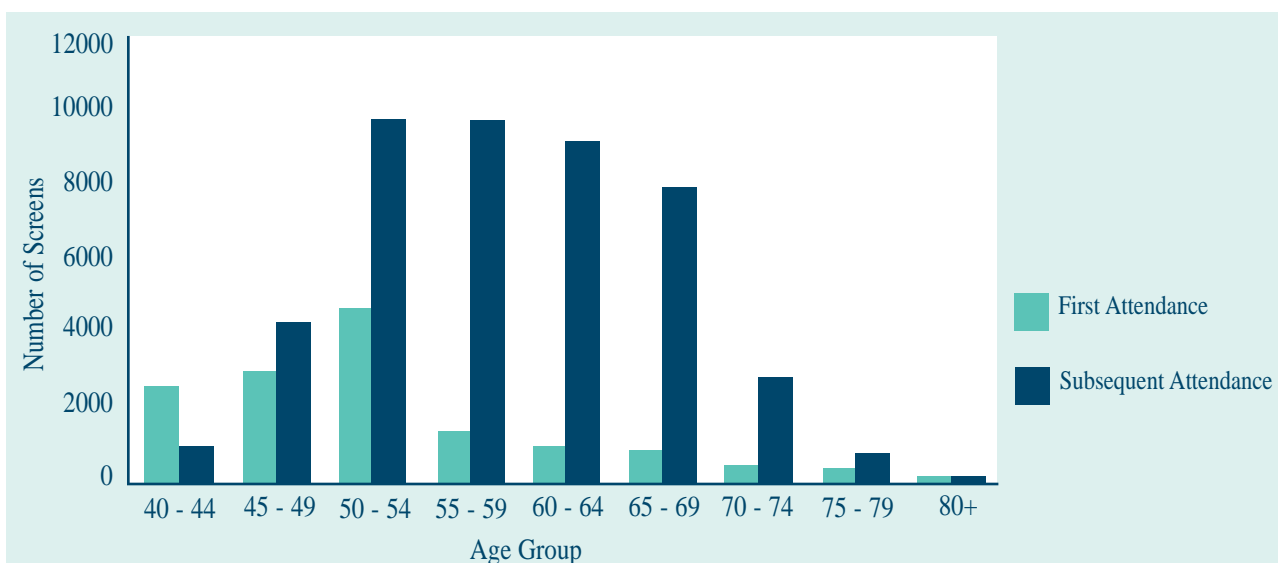
Women attending for the first time made up 14,568 (24.2%) of total screens. The majority of women, 45,543 (75.8%) were returning for a subsequent screen. Fifty-five women attended for their seventh or eighth mammogram with the program. The classification of "first" screen and "subsequent" screen refers to the screening history of the woman within the program. Of the women attending in 1998 for a first screen, 27% reported having a previous mammogram elsewhere within the previous five years.

Table 1 Screening mammograms for 1998 by attendance and age

Type of attendance	AGE GROUP					50-69	Total
	40-49	50-59	60-69	70-79	80+		
First screen	5597 52.5%	6083 23.8%	1804 9.5%	906 20.0%	178 49.7%	7887 17.7%	14568 24.2%
Subsequent screen	5065 47.5%	19503 76.2%	17175 90.5%	3620 80.0%	180 50.3%	36678 82.3%	45543 75.8%
Total Screens	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%
All screens	10662	25586	18979	4526	358	44565	60111
Age distribution	17.7%	42.6%	31.6%	7.5%	0.6%	74.1%	100.0%

Figure 2.1 shows first and subsequent screens stratified by five-year age groups. The single largest number of first screens applied to the 50 to 54 age group.

Figure 2.1 Number of women screened by attendance type



2.2.2 Area of residence

In South Australia, most of the population of women aged 40 years and over lives in or near Adelaide, with 78.1% residing in Adelaide or Outer Adelaide.⁶ Outer Adelaide stretches from Mallala in the north to Victor Harbor in the south. Another 7.5% of women reside in the six major rural towns of Mt Gambier, Port Pirie, Port Augusta, Port Lincoln, Murray Bridge and Whyalla. A further 12.3% reside in other rural areas and 2.0% are in regions classified as remote.⁷

Table 2 shows women screened by age and area of residence. The areas classified as "Rural Town", "Other Rural" and "Remote", as well as some of the "Outer Adelaide" areas, approximate to the localities visited every two years by two mobile units.

In 1998, the mobile units performed 14,465 screens, which represented 24.1% of total screens. From the estimated population data for 1998, only 21% of all eligible SA women live in the areas visited by the mobile units. This indicates that women from country areas are participating at a higher rate than urban women.

Table 2 Women screened by age and area of residence

Residential area	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Adelaide	7538 70.7%	17632 68.9%	13140 69.2%	3052 67.4%	229 64.0%	30772 69.0%	41591 69.2%
Outer Adelaide	850 8.0%	2228 8.7%	1759 9.3%	466 10.3%	45 12.6%	3987 8.9%	5348 8.9%
Rural Town	721 6.8%	2015 7.9%	1459 7.7%	297 6.6%	25 7.0%	3474 7.8%	4517 7.5%
Other Rural	1242 11.6%	3172 12.4%	2311 12.2%	622 13.7%	53 14.8%	5483 12.3%	7400 12.3%
Remote	294 2.8%	517 2.0%	296 1.6%	84 1.9%	5 1.4%	813 1.8%	1196 2.0%
Interstate	17 0.2%	22 0.1%	14 0.1%	5 0.1%	1 0.3%	36 0.1%	59 0.1%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%

⁶ ABS Estimated Residential Population 1998.

⁷ Commonwealth Dept of Health and Family Services, January 1994, *Rural/Remote Areas Classification*.



2.2.3 Country of birth

Of the women screened at BreastScreen SA in 1998, approximately one third (33.1%) were born overseas. This is similar to that indicated by the 1996 Census, which reports 31.6% of South Australian women aged 40 and over were born overseas. Almost half the 20,151 overseas-born women who attended in 1998 were from countries where English was not the first language spoken. The majority of clients not born in Australia were from the United Kingdom, Europe and Asia.

Table 3 Women screened by country of birth and age

Country of birth	AGE GROUP					50-69	Total
	40-49	50-59	60-69	70-79	80+		
Australia	7670 71.9%	16832 65.8%	11893 62.7%	3269 72.2%	296 82.7%	28725 64.5%	39960 66.5%
United Kingdom & Eire	1399 13.1%	4432 17.3%	3617 19.1%	644 14.2%	40 11.2%	8049 18.1%	10132 16.9%
Italy	249 2.3%	905 3.5%	998 5.3%	136 3.0%	2 0.6%	1903 4.3%	2290 3.8%
Greece	104 1.0%	502 2.0%	444 2.3%	48 1.1%	0 0.0%	946 2.1%	1098 1.8%
Germany	130 1.2%	527 2.1%	419 2.2%	101 2.2%	3 0.8%	946 2.1%	1180 2.0%
Netherlands	132 1.2%	412 1.6%	245 1.3%	65 1.4%	4 1.1%	657 1.5%	855 1.4%
Other Europe / USSR	262 2.5%	803 3.1%	726 3.8%	163 3.6%	6 1.7%	1529 3.4%	1960 3.3%
Vietnam	147 1.4%	98 0.4%	72 0.4%	6 0.1%	0 0.0%	170 0.4%	323 0.5%
Other South-East Asia	154 1.4%	264 1.0%	98 0.5%	13 0.3%	0 0.0%	362 0.8%	529 0.9%
Other Asia	86 0.8%	168 0.7%	123 0.6%	22 0.5%	1 0.3%	291 0.7%	400 0.7%
Middle East and Africa	94 0.9%	192 0.8%	112 0.6%	21 0.5%	2 0.6%	304 0.7%	421 0.7%
Northern America	48 0.5%	73 0.3%	27 0.1%	8 0.2%	1 0.3%	100 0.2%	157 0.3%
Other	164 1.5%	262 1.0%	134 0.7%	17 0.4%	2 0.6%	396 0.9%	579 1.0%
Not stated	23 0.2%	116 0.5%	71 0.4%	16 0.4%	1 0.3%	187 0.4%	227 0.4%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%

2.2.4 Language spoken at home

Over 7,000 women (11.7%) screened by the program during 1998 reported that they did not usually speak English at home.

The majority of these women were in the target age group 50 to 69. During 1998, 12.5% of women aged 50 to 69 screened at BreastScreen SA stated that they usually spoke a language other than English at home. This is a lower percentage than the figure in the 1996 Census, which identified 16.0% of females in South Australia in this age group as speaking a language other than English at home.

BreastScreen SA provides free interpreter services for women who require assistance for bookings, screening and assessment.

Table 4 Women screened by language spoken at home and age

Language spoken at home	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Usually English	9575 89.8%	22631 88.5%	16127 85.0%	4079 90.1%	344 96.1%	38758 87.0%	52756 87.8%
Usually other than English	1025 9.6%	2809 11.0%	2745 14.5%	427 9.4%	12 3.4%	5554 12.5%	7018 11.7%
Not stated	62 0.6%	146 0.6%	107 0.6%	20 0.4%	2 0.6%	253 0.6%	337 0.6%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%

2.2.5 Indigenous women

In 1998, 187 women screened at BreastScreen SA identified themselves as being of Aboriginal or Torres Strait Islander descent, representing 0.3% of total screens. The 1996 Census reports 0.5% of South Australian women over 40 years of age identified themselves as being of Aboriginal or Torres Strait Islander descent, and 30% of these Indigenous women resided in areas other than Adelaide.

Table 5 Indigenous women screened by age

Indigenous Women	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Yes	49 0.5%	81 0.3%	52 0.3%	4 0.1%	1 0.3%	133 0.3%	187 0.3%
No	10581 99.2%	25435 99.4%	18883 99.5%	4509 99.6%	351 98.0%	44318 99.4%	59759 99.4%
Not Stated	32 0.3%	70 0.3%	44 0.2%	13 0.3%	6 1.7%	114 0.3%	165 0.3%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%

2.2.6 Women with symptoms

BreastScreen SA is a population-based screening program for asymptomatic women. However, some women do present with a symptom *at the time of screening*. If no mammographic abnormality is detected, women are advised to visit their doctor for clinical assessment of their symptoms.

Table 6 shows the symptom status of the women at the time of screening. The category ‘nipple discharge’ includes women reporting any type of nipple discharge. The category ‘other breast symptoms’ includes a variety of symptoms, particularly breast pain or tenderness.

A total of 89.4% of women said they had no breast symptoms. A larger proportion of the younger women reported symptoms, with 6.1% of this age group reporting a breast lump.

These figures are similar to the 1997 statistics on women with symptoms.

Table 6 Women screened by symptoms and age

Symptoms	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Breast lump	648 6.1%	808 3.2%	331 1.7%	83 1.8%	5 1.4%	1139 2.6%	1875 3.1%
Nipple discharge	157 1.5%	160 0.6%	47 0.2%	18 0.4%	3 0.8%	207 0.5%	385 0.6%
Other breast symptoms	1126 10.6%	1601 6.3%	976 5.1%	377 8.3%	55 15.4%	2577 5.8%	4135 6.9%
No breast symptoms	8731 81.9%	23017 90.0%	17625 92.9%	4048 89.4%	295 82.4%	40642 91.2%	53716 89.4%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%



2.2.7 Family history of breast cancer

At the beginning of 1998, women aged 40 to 49 with a strong family history of breast cancer were eligible for annual screening. From 1 July 1998 this was extended to include women 50 years of age and over. BreastScreen SA classifies a woman as having a strong family history of breast cancer if she has one of the following:

- a first-degree relative (mother/sister/daughter, father/brother/son) with breast cancer diagnosed before the age of 50;
- a first-degree relative with cancer in both breasts (diagnosed at any age);
- two or more first-degree relatives with breast cancer (diagnosed at any age).

The rest of the women who mention any family history of breast cancer are classified as "other family history". The majority of women attending for screening do not have a strong family history of breast cancer. For women under 50 years of age and those aged 70 years or more, there was an increased percentage with a strong family history.

Table 7 Women screened with a family history of breast cancer by age

Family history of breast cancer	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Strong family history	1002 9.4%	1335 5.2%	1133 6.0%	554 12.2%	45 12.6%	2468 5.5%	4069 6.8%
Other family history	2515 23.6%	4409 17.2%	2958 15.6%	755 16.7%	67 18.7%	7367 16.5%	10704 17.8%
No family history	6987 65.5%	19565 76.5%	14728 77.6%	3186 70.4%	242 67.6%	34293 77.0%	44708 74.4%
Not stated	158 1.5%	277 1.1%	160 0.8%	31 0.7%	4 1.1%	437 1.0%	630 1.0%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%

2.2.8 Personal history of breast cancer

Of all women screened, 267 (0.4%) said they had a personal history of breast cancer. These women are eligible for annual screening if more than 10 years have elapsed from diagnosis or they are not under the regular care of a surgeon.



2.2.9 Hormone replacement therapy

At the time of screening, women are asked whether they have been taking hormone replacement therapy (HRT) during the last six months. HRT usage was reported in 46.3% of the women aged 50 to 59 and 35.1% for women aged 60 to 69.

Table 8 Hormone replacement therapy by age

HRT use	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Yes	2299 21.6%	11841 46.3%	6667 35.1%	956 21.1%	31 8.7%	18508 41.5%	21794 36.3%
No	8353 78.3%	13726 53.6%	12304 64.8%	3563 78.7%	326 91.1%	26030 58.4%	38272 63.7%
Unknown	10 0.1%	19 0.1%	8 0.0%	7 0.2%	1 0.3%	27 0.1%	45 0.1%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%

2.2.10 Breast implant status

In 1998, there were 341 (0.6%) women screened who had breast implants. Of these, 73 (21.4%) were aged 40 to 49, 205 (60.1%) were aged 50 to 59, and 63 (18.5%) were aged 60 or older.

Table 9 Breast implant status by age

Breast implant status	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Yes	73 0.7%	205 0.8%	59 0.3%	4 0.1%	0 0.0%	264 0.6%	341 0.6%
No	10588 99.3%	25379 99.2%	18919 99.7%	4522 99.9%	358 100.0%	44298 99.4%	59766 99.4%
Unknown	1 0.0%	2 0.0%	1 0.0%	0 0.0%	0 0.0%	3 0.0%	4 0.0%
Total	10662 100%	25586 100%	18979 100%	4526 100%	358 100%	44565 100%	60111 100%

2.2.11 Attendance

Invitations

The majority of women (59.2%) attended BreastScreen SA as a result of a personalised invitation letter, either based on the electoral roll or a routine recall. An "electoral roll" invitation is sent to women aged 50 to 69 who are on the electoral roll and have not previously attended for a screen. If these women do not respond, a re-invitation is sent 12 months later. In 1998, BreastScreen SA sent 5,734 electoral roll invitations, with 1,543 (26.9%) responding to the letter. Also, 2,068 re-invitations for a first screen were sent with a 28.5% response.

Most women who have attended BreastScreen SA are re-invited every two years. At 23 months after their last screen, these women receive a "routine recall" invitation. Women with a previous history of breast cancer or a strong family history of the disease are screened annually. They are re-invited 11 months after their previous screen. In 1998, "routine recall" invitations were sent to 47,101 women, of whom 34,639 (73.5%) responded. A significant number of women (41%) initiated their own appointments spontaneously.

Recruitment method

Table 10 shows the number of women who responded and made an appointment within three months of receiving an invitation. Only 2,049 (14.1%) of the 14,568 women attending for the first time did so as a direct response to an electoral roll invitation. For women attending for a subsequent screen, 33,544 (73.7%) of the 45,543 did so within three months of receiving their "routine recall" invitation.

Table 10 Attendance type and response to invitation by age

Attendance type and response to invitation*	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
First screen							
Response to an invitation (within 3 months)	25 0.4%	1489 24.5%	503 27.9%	30 3.3%	2 1.1%	1992 25.3%	2049 14.1%
Initiate own appointment	5572 99.6%	4594 75.5%	1301 72.1%	876 96.7%	176 98.9%	5895 74.7%	12519 85.9%
Subtotal first screen	5597 100%	6083 100%	1804 100%	906 100%	178 100%	7887 100%	14568 100%
Subsequent screens							
Response to an invitation	3345 66.0%	15668 80.3%	14349 83.5%	181 5.0%	1 0.6%	30017 81.8%	33544 73.7%
Initiate own appointment	1720 34.0%	3835 19.7%	2826 16.5%	3439 95.0%	179 99.4%	6661 18.2%	11999 26.3%
Subtotal subsequent screens	5065 100%	19503 100%	17175 100%	3620 100%	180 100%	36678 100%	45543 100%

* Women who postpone an appointment are re-invited at a later date.

2.2.12 Rescreen rates

The rescreen rate is the percentage of women returning for a mammogram within 27 months of a previous screen. According to the BreastScreen Australia National Accreditation Requirements, rescreen rates for women aged 50 to 69 are expected to be greater than or equal to 75%. Subsequent attendances for women screened during 1996 were analysed (Table 11). Age was calculated at the time of the 1998 screen. Rescreen rates for 1998 increased since 1997 in almost all age groups, the only decrease being in the 60-69 year age group.

Table 11 Rescreen rates by age

Rescreen rates	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Women screened in 1996	8810	20576	16340	2489	160	36916	48376
Women returning within 27 months	6240	16960	12315	927	28	29275	36470
Rescreen rate	70.8%	82.4%	75.4%	37.2%	17.5%	79.3%	75.4%

In 1998, the proportion of the target age group that returned for a rescreen within 27 months was 79.3%.

2.2.13 Number of technical repeats

The majority of women who attend for screening have a total of four films taken, that is two views of each breast. Women with larger breasts can require more than four films. Occasionally, films have to be repeated because of incorrect positioning, over-exposure or under-exposure of films, film processing faults and movement during filming. The following table shows the proportion of repeat films for each age group.

Table 12 Technical repeats by age

Films	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Total films	50550	122826	92773	21773	1685	215599	289607
Repeat films	1059	2483	1845	420	50	4328	5857
% Repeat Films	2.1%	2.0%	2.0%	1.9%	3.0%	2.0%	2.0%

The technical repeat rate of 2.0% meets the National Accreditation Requirement, which specifies that technical repeats should apply to less than 3% of total films used.

2.2.14 Participation rates

Recruitment activities are directed at ensuring that all eligible women, particularly those within the target age group, have equal opportunity to attend for screening. Participation rates are regularly monitored and analysed to identify those groups of women and residential areas that might be under-represented. This applies particularly to women from rural and remote areas, Indigenous women and women from CALD backgrounds.

For BreastScreen services operating for at least five years, the National Accreditation Requirements are for a 60% participation rate among the 50 to 69 year age group over a 24-month period. However, the overall aim of the program is to screen 70% of this target age group. In this report, the calculation is based on the number of women per age group attending BreastScreen SA during a 24-month period as a proportion of the population for that period. The average of the Estimated Residential Populations of 1997 and 1998 from the Australian Bureau of Statistics is used.

Table 13 Participation rates for 24 months by area of residence and age for all women (1 January 1997 - 31 December 1998)

AREA OF RESIDENCE		AGE GROUP		
		40-49	50-69	70-79
Adelaide Statistical Division	Population	80460	105439	67177
	Women screened	13033	60130	5466
	Participation rate	16.2%	57.0%	8.1%
Other than Adelaide	Population	27797	38603	21187
	Women screened	5192	25608	2564
	Participation rate	18.7%	66.3%	12.1%
Total	Population	108257	144042	88364
	Women screened	18225	85738	8030
	Participation rate	16.8%	59.5%	9.1%

The 24-month participation rate for women aged 50 to 69 was 59.5%, an increase of more than 3.1% over the 1997 figure of 56.4%. The data presented here are for the 24-month period, in line with changes recommended by the Australian Institute of Health and Welfare. Women in all age groups living outside of Adelaide participated at a higher rate than did women residing in the metropolitan area.

The National Accreditation Requirement states that in urban areas, the recruitment rate for Aboriginal and Torres Strait Islander women and CALD women will be at least 50% of the rate for the general population. Recruitment activities are directed at the target age group.

CALD women in the target age group have a lower participation rate than occurring for all women. The participation of CALD women attending BreastScreen SA over a 24-month period is presented in Table 14. As the available population figures for language spoken are from the 1996 Census, these rates are calculated with different populations from those used in Table 13. This means that the CALD participation figures will be an over-estimate of true participation.



While participation rates for all women aged 50 to 69 differ between country and urban areas by 9%, participation rates for CALD women show only a 2% difference. This implies that CALD women in the country areas are not participating at such a high rate as English speaking women.

Table 14 Participation rates for 24 months by area of residence and age for CALD women (1 January 1997 – 31 December 1998)

CALD women	AGE GROUP		
	40-49	50-69	70-79
Area of Residence			
Adelaide Statistical Division	15.7%	54.3%	8.4%
Other than Adelaide	18.4%	56.3%	9.5%
Total	15.9%	54.5%	8.5%

Population figures for Indigenous women for the target age group are from the 1996 Census. Table 15 indicates that in urban areas, 34.2% of Indigenous women participated in the 24 months to 31 December 1998 (58% of the rate for the general population). In country areas, where two mobile units provided mammograms, the participation rate was higher, with 48.5% participation by Indigenous women aged 50 to 69 years.

Table 15 Participation rates for 24 months by area of residence and age for Indigenous women (1 January 1997 – 31 December 1998)

Indigenous women	AGE GROUP		
	40-49	50-69	70-79
Area of Residence			
Adelaide Statistical Division	8.7%	34.2%	8.8%
Other than Adelaide	15.7%	48.5%	20.0%
Total	12.3%	42.6%	15.3%

2.3 Screening outcomes

From 60,111 screens provided in 1998, a total of 1,547 women were recommended for assessment of a screen-detected abnormality. This represents an overall assessment recall rate of 2.6%. For women who attended BreastScreen SA for the first time, 3.9% had a screen-detected abnormality requiring assessment. For subsequent attenders the rate was 2.2%. These recall rates are well within the National Accreditation Requirements standard, namely, that recalls should apply to less than 10% of women screened at the prevalent round and less than 5% of women screened at the incident round. A screening round is defined as prevalent if it is the first mammogram ever for a woman or the first mammogram for five years. Incident screens are all other screens. A first screen at BreastScreen SA approximates to the prevalent round, although the figures presented in this report are classified more accurately as first screen and subsequent screen. Although the number of women aged 80 and over attending for screening is small, they have a higher recall rate of 5.6%.

Table 16 Outcome of screening by attendance and age

Screening outcomes	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
First screen							
Routine rescreen	5405 96.6%	5842 96.0%	1717 95.2%	877 96.8%	165 92.7%	7559 95.8%	14006 96.1%
Assessment recommended	192 3.4%	241 4.0%	87 4.8%	29 3.2%	13 7.3%	328 4.2%	562 3.9%
Subtotal first screen	5597 100%	6083 100%	1804 100%	906 100%	178 100%	7887 100%	14568 100%
Subsequent screen							
Routine rescreen	4955 97.8%	19124 98.1%	16778 97.7%	3528 97.5%	173 96.1%	35902 97.9%	44558 97.8%
Assessment recommended	110 2.2%	379 1.9%	397 2.3%	92 2.5%	7 3.9%	776 2.1%	985 2.2%
Subtotal	5065 100%	19503 100%	17175 100%	3620 100%	180 100%	36678 100%	45543 100%
Total screens	10662	25586	18979	4526	358	44565	60111
Total assessments recommended	302	620	484	121	20	1104	1547
Percentage recalled to assessment	2.8%	2.4%	2.6%	2.7%	5.6%	2.5%	2.6%



2.4 Assessment

2.4.1 Procedures

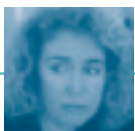
Women recalled to the assessment clinic undergo further imaging, clinical examination and fine needle aspiration biopsy (FNAB) or core biopsy, as required. Cytology results of FNAB are provided on site on the same day and core biopsy results are available within 24 hours. The outcomes of an assessment visit include a benign diagnosis, referral for definitive treatment, referral for diagnostic open biopsy or early recall to assessment. Most women have more than one procedure in the clinic. Of 1,547 women recommended for assessment, one woman declined to attend. Five of the women attended for assessment at sites other than BreastScreen SA and information was obtained regarding their outcome.

Assessment Clinic sessions are divided into Level 1 and Level 2. All women recalled will attend Level 1 assessment during a morning. Level 1 includes further x-rays and/or ultrasound, and a clinical examination by a medical officer. Those women cleared after Level 1 are re-invited when their next mammogram is due.

Table 17 Procedures at Level 1 assessment for individual women by age

Type of assessment	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Level 1							
Further x-rays only	45 14.9%	97 15.6%	65 13.4%	20 16.5%	5 25.0%	162 14.7%	232 15.0%
Ultrasound only	32 10.6%	74 11.9%	58 12.0%	19 15.7%	1 5.0%	132 12.0%	184 11.9%
X-rays + ultrasound	225 74.5%	446 71.9%	360 74.5%	82 67.8%	14 70.0%	806 73.1%	1127 72.9%
Other*	0 0.0%	3 0.5%	0 0.0%	0 0.0%	0 0.0%	3 0.3%	3 0.2%
Total Level 1	302 100%	620 100%	483 100%	121 100%	20 100%	1103 100%	1546 100%
Women attending Level 2 assessment	129 42.7%	294 47.4%	233 48.2%	63 52.1%	11 55.0%	527 47.8%	730 47.2%

In 1998, there were 730 women (47.2%) who attended Level 1 assessment who needed further assessment at Level 2. This involved an additional clinical examination by a surgeon. All except 26 of the women who attended Level 2 assessment proceeded to biopsy. Most biopsies were initially a FNAB, but four women proceeded straight to core biopsy.



* Two women assessed elsewhere had no Level 1 information; one woman had clinical assessment only.

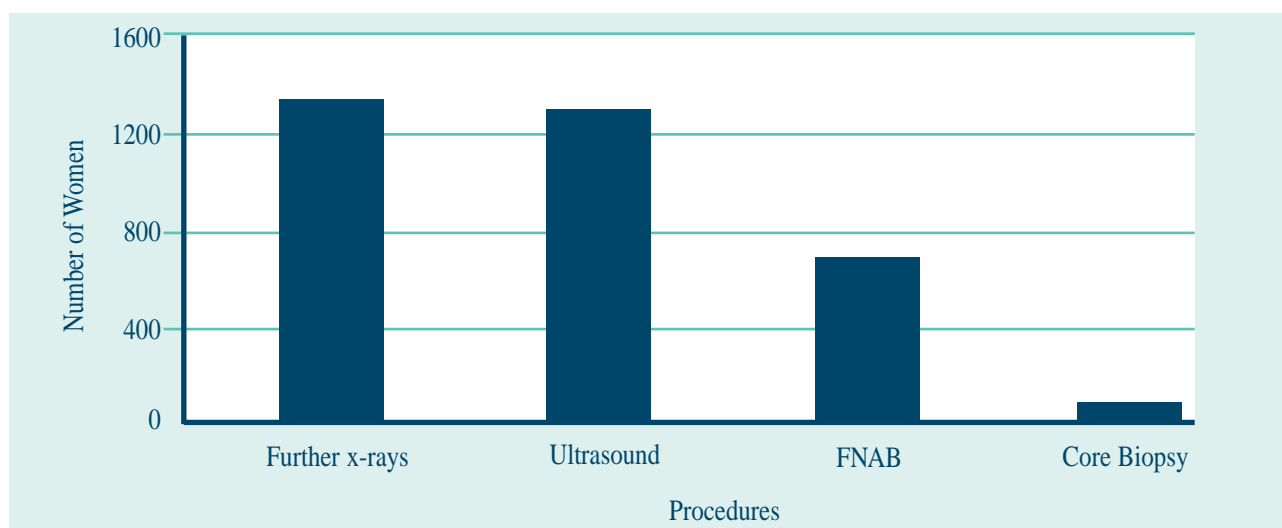
Table 18 Procedures at Level 2 assessment for individual women by age

	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Level 2 : Surgical assessment							
Surgical examination only (no radiological abnormality)	6 4.7%	12 4.1%	5 2.1%	3 4.8%	0 0.0%	17 3.2%	26 3.6%
Biopsies							
FNA only	101 78.3%	236 80.3%	182 78.1%	45 71.4%	9 81.8%	418 79.3%	573 78.5%
Core only	1 0.8%	1 0.3%	2 0.9%	0 0.0%	0 0.0%	3 0.6%	4 0.5%
FNA and Core	21 16.3%	45 15.3%	44 18.9%	15 23.8%	2 18.2%	89 16.9%	127 17.4%
Total level 2	129 100%	294 100%	233 100%	63 100%	11 100%	527 100%	730 100%

A total of 1,546 women attended for Level 1 assessment and 730 women continued on to Level 2 assessment. At Level 2, 573 women had an FNAB, four had a core biopsy and 127 had both an FNAB and core biopsy. In addition to these procedures, all women at Level 2 have a clinical examination performed by the surgeon. Figure 2.2 shows the number of women having each of the procedures.

Most women have more than one procedure at assessment. There were 3,501 assessment procedures undertaken (excluding clinical examinations by a surgeon) for the 1,546 women attending assessment in 1998. Further x-rays and ultrasound were the two most frequently used procedures.

Figure 2.2 Number of women undergoing each procedure at assessment



2.4.2 FNAB and core biopsy procedures

In 1998, 901 biopsies were performed on 704 women. FNABs were either by direct palpation or were guided by ultrasound or by stereotaxis. The majority (83.3%) of the FNABs and all core biopsies were performed with a guided technique. The method used for all biopsies performed is shown in Table 19.

Table 19 Number of FNAB and core biopsy procedures by method and age

Method	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
FNAB							
Palpation	17 12.5%	58 18.9%	40 16.4%	10 14.5%	3 25.0%	98 17.8%	128 16.7%
Guided by:							
- Ultrasound	77 56.6%	153 49.8%	140 57.4%	44 63.8%	8 66.7%	293 53.2%	422 54.9%
- Stereotaxis	42 30.9%	96 31.3%	64 26.2%	15 21.7%	1 8.3%	160 29.0%	218 28.4%
Total FNA	136 100%	307 100%	244 100%	69 100%	12 100%	551 100%	768 100%
Core biopsy							
Guided by:							
- Ultrasound	10 45.5%	24 51.1%	23 48.9%	6 40.0%	2 100.0%	47 50.0%	65 48.9%
- Stereotaxis	11 50.0%	23 48.9%	21 44.7%	9 60.0%	0 0.0%	44 46.8%	64 48.1%
Not stated*	1 4.5%	0 0.0%	3 6.4%	0 0.0%	0 0.0%	3 3.2%	4 3.0%
Total Core	22 100%	47 100%	47 100%	15 100%	2 100%	94 100%	133 100%
Total biopsies	158	354	291	84	14	645	901



* Only limited information for four cases of core biopsy performed outside of BreastScreen SA.

2.4.3 Outcome of assessment

As shown in Table 20, of the 1,546 women attending for assessment, 269 women had a malignancy detected and 192 were recommended for diagnostic open biopsy. Open biopsy is not performed within the BreastScreen SA program. Seventy cases of breast cancer and 13 cases of atypical hyperplasia were diagnosed by open biopsy. Seventeen women who were screened in 1998 and attended for assessment were recommended for early recall to assessment and their final outcome is included in Tables 20 and 21.

Table 20 Initial outcome after assessment clinic by age

Outcome of assessment	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Malignant	25 8.3%	102 16.5%	104 21.5%	32 26.4%	6 30.0%	206 18.7%	269 17.4%
Referred for diagnostic open biopsy	41 13.6%	75 12.1%	62 12.8%	10 8.3%	4 20.0%	137 12.4%	192 12.4%
Benign - rescreen in two years	236 78.1%	443 71.5%	317 65.6%	79 65.3%	10 50.0%	760 68.9%	1085 70.2%
Total assessed	302 100.0%	620 100.0%	483 100.0%	121 100.0%	20 100.0%	1103 100.0%	1546 100.0%

Table 21 includes the results of open biopsies to demonstrate the final outcome. A total of 339 (21.9%) of those women attending the assessment clinic were diagnosed with breast cancer.

Table 21 infers that the likelihood of a malignant diagnosis increases with age.

Table 21 Final diagnosis after all diagnostic procedures

Outcome of assessment	AGE GROUP						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Malignant (discharged)	35 11.6%	127 20.5%	131 27.1%	38 31.4%	8 40.0%	258 23.4%	339 21.9%
Premalignant (discharged)	5 1.7%	4 0.6%	4 0.8%	0 0.0%	0 0.0%	8 0.7%	13 0.8%
Benign - rescreen in two years	262 86.8%	489 78.9%	348 72.0%	83 68.6%	12 60.0%	837 75.9%	1194 77.2%
Total assessed	302 100.0%	620 100.0%	483 100.0%	121 100.0%	20 100.0%	1103 100.0%	1546 100.0%

2.5 Breast cancer detection rate

2.5.1 Breast cancer diagnosis rate

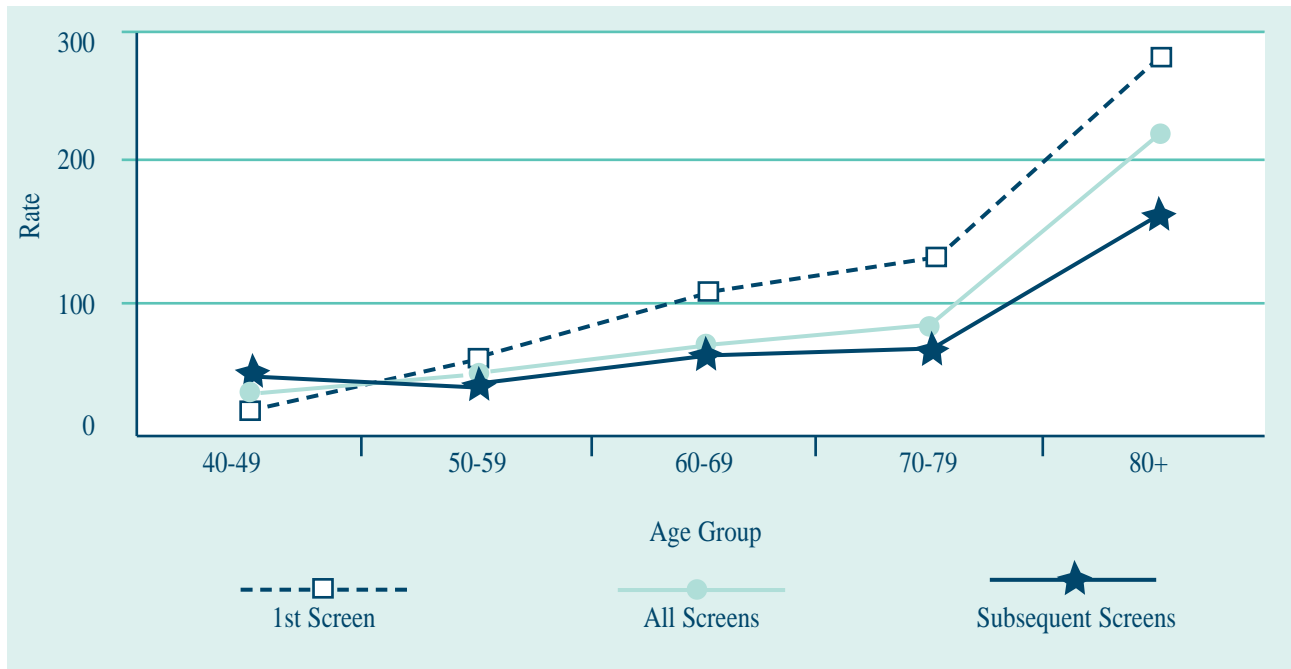
The cancer detection rate was 56.4 per 10,000 women screened, derived from 339 cancers detected from 60,111 screens. Table 22 and Figure 2.4 show that the cancer detection rate increases with age. BreastScreen Australia National Accreditation Requirements state that the breast cancer detection rate for women screened in the prevalent round should be greater than 50 per 10,000 screens and for women screened in incident rounds, greater than 20 per 10,000 screens. The 1998 cancer detection rates exceeded these requirements, with rates of 59 per 10,000 for women attending for a first screen and 56 per 10,000 for women attending for a subsequent screen. A screening round is defined as prevalent if it is the first mammogram ever for a woman or the first mammogram for five years. A first screen at BreastScreen SA approximates to the prevalent round, however, the figures presented in this report, and also commonly required for national reports, are classified as first screen and subsequent screen.

Table 22 Breast cancer detection rate per 10,000 screens by attendance and age

Screens and cancer	AGE GROUP					50-69 (95% CI)	Total (95% CI)
	40-49	50-59	60-69	70-79	80+		
First screen							
Cancers	14	35	20	12	5	55	86
Screens	5597	6083	1804	906	178	7887	14568
Rate per 10,000 screens	25.0	57.5	110.9	132.5	280.9	69.7 (51.4 – 88.1)	59.0 (46.6 – 71.5)
Subsequent screens							
Cancers	21	92	111	26	3	203	253
Screens	5065	19503	17175	3620	180	36678	45543
Rate per 10,000 screens	41.5	47.2	64.6	71.8	166.7	55.3 (47.8 – 62.9)	55.6 (48.7 – 62.4)
Total							
Cancers	35	127	131	38	8	258	339
Screens	10662	25586	18979	4526	358	44565	60111
Rate per 10,000 screens	32.8	49.6	69.0	84.0	223.5	57.9 (50.8 – 64.9)	56.4 (50.4 – 62.4)



Figure 2.4 Breast cancer detection rate per 10,000 screens by attendance and age



2.5.2 Method of pathological diagnosis of breast cancer

The procedures undertaken for a pathological diagnosis of breast cancer are shown in Table 23.

The majority of cancers (66.7%) were diagnosed by FNAB.

Table 23 Method of diagnosis

Method of diagnosis	Women diagnosed with cancer	Percentage
FNAB	226	66.7%
Core biopsy	44	13.0%
Diagnostic open biopsy	69	20.3%
Total	339	100%

2.5.3 Breast cancer by histological type

In 1998, the program diagnosed a total of 339 primary breast cancers. Table 24 shows that seventy-one of these (20.9%) were ductal carcinoma in-situ (DCIS).

Table 24 Histopathology by attendance type and age

		AGE GROUP					50-69	Total
		40-49	50-59	60-69	70-79	80+		
First screen	Invasive	11 78.6%	27 77.1%	18 90.0%	11 91.7%	5 100.0%	45 81.8%	72 83.7%
	DCIS	3 21.4%	8 22.9%	2 10.0%	1 8.3%	0 0.0%	10 18.2%	14 16.3%
Subtotal		14 100%	35 100%	20 100%	12 100%	5 100%	55 100%	86 100%
Subsequent screens	Invasive	12 57.1%	71 77.2%	88 79.3%	22 84.6%	3 100.0%	159 78.3%	196 77.5%
	DCIS	9 42.9%	21 22.8%	23 20.7%	4 15.4%	0 0.0%	44 21.7%	57 22.5%
Subtotal		21 100%	92 100%	111 100%	26 100%	3 100%	203 100%	253 100%
Total screens	Invasive	23 65.7%	98 77.2%	106 80.9%	33 86.8%	8 100.0%	204 79.1%	268 79.1%
	DCIS	12 34.3%	29 22.8%	25 19.1%	5 13.2%	0 0.0%	54 20.9%	71 20.9%
Total		35 100%	127 100%	131 100%	38 100%	8 100%	258 100%	339 100%



Table 25 shows that there was little difference in the detection rate of both invasive cancers and DCIS between first screen and subsequent screen attenders.

Table 25 Breast cancer detection rate per 10,000 women by histological type, attendance and age

Screens and cancer	AGE GROUP					50-69 (95% CI)	Total (95% CI)
	40-49	50-59	60-69	70-79	80+		
First screen							
Invasive	11	27	18	11	5	45	72
Rate /10,000 screens	19.7	44.4	99.8	121.4	280.9	57.1 (40.4 – 73.7)	49.4 (38.0 – 60.8)
DCIS	3	8	2	1	0	10	14
Rate /10,000 screens	5.4	13.2	11.1	11.0	0.0	12.7 (4.8 – 20.5)	9.6 (4.6 – 14.6)
Subsequent screens							
Invasive	12	71	88	22	3	159	196
Rate /10,000 screens	23.7	36.4	51.2	60.8	166.7	43.4 (36.6 – 50.1)	43.0 (37.0 – 49.0)
DCIS	9	21	23	4	0	44	57
Rate /10,000 screens	17.8	10.8	13.4	11.0	0.0	12.0 (8.5 – 15.5)	12.5 (9.3 – 15.8)
Total screens							
Invasive	23	98	106	33	8	204	268
Rate /10,000 screens	21.6	38.3	55.9	72.9	223.5	45.8 (39.5 – 52.0)	44.6 (39.3 – 49.9)
DCIS	12	29	25	5	0	54	71
Rate /10,000 screens	11.3	11.3	13.2	11.0	0.0	12.1 (8.9 – 15.3)	11.8 (9.1 – 14.6)



Table 26 indicates that in 1998, infiltrating ductal carcinoma of no special type accounted for 63.4% of all cancers diagnosed. The second most common finding was DCIS (20.9%). Lobular carcinoma and its variants constituted 6.8% of the cancers detected.

Table 26 Histological type of breast cancer

Breast cancer type	Number	Percentage
Infiltrating ductal – no special type	215	63.4%
Tubular	13	3.8%
Cribriform	1	0.3%
Mucinous	4	1.2%
Lobular classical	17	5.0%
Lobular variant	6	1.8%
Mixed ductal/lobular	11	3.2%
Other primary	1	0.3%
Non-invasive DCIS	71	20.9%
Total	339	100.0%

2.5.4 Size of invasive breast cancers detected

The breast cancer detection rate by size of tumour and attendance type is presented in Table 27. Of first round attenders, 22.2% of women aged 50 to 69 had invasive breast cancers measuring 10mm or less. The rate of detection of small invasive cancers (10mm or less) for the 50 to 69 age group was 12.7 per 10,000 screens. Of the women attending for subsequent rounds, 35.2% of women aged 50 to 69 had small invasive cancers.

BreastScreen Australia's National Accreditation Requirement is that 8 per 10,000 women screened have invasive cancers <= 10mm diameter. Eighty-eight women had cancers <= 10mm, a rate of 14.6 per 10,000 women screened.



Table 27 Invasive breast cancer detection rate by tumour size, attendance type and age

Size and Detection Rate	AGE GROUP					50-69 (95% CI)	Total (95% CI)
	40-49	50-59	60-69	70-79	80+		
First screen							
<= 10mm	2	6	4	2	1	10	15
	18.2%	22.2%	22.2%	18.2%	20.0%	22.2%	20.8%
Rate/10,000 screens	3.6	9.9	22.2	22.1	56.2	12.7 (4.8 – 20.5)	10.3 (5.1 – 15.5)
11-15mm	4	7	8	5	0	15	24
	36.4%	25.9%	44.4%	45.5%	0.0%	33.3%	33.3%
Rate/10,000 screens	7.1	11.5	44.3	55.2	0.0	19.0 (9.4 – 28.6)	16.5 (9.9 – 23.1)
>15mm	5	13	6	4	3	19	31
	45.5%	48.1%	33.3%	36.4%	60.0%	42.2%	43.1%
Rate/10,000 screens	8.9	21.4	33.3	44.2	168.5	24.1 (13.3 – 34.9)	21.3 (13.8 – 28.8)
Unknown	0	1	0	0	1	1	2
	0.0%	3.7%	0.0%	0.0%	20.0%	2.2%	2.8%
Rate/10,000 screens	0.0	1.6	0.0	0.0	56.2	1.3	1.4
Subtotal	11	27	18	11	5	45	72
	100%	100%	100%	100%	100%	100%	100%
Rate/10,000 screens	19.7	44.4	99.8	121.4	280.9	57.1 (40.4 – 73.7)	49.4 (38.0 – 60.8)
Subsequent screens							
<= 10mm	3	25	31	11	3	56	73
	25.0%	35.2%	35.2%	50.0%	100.0%	35.2%	37.2%
Rate/10,000 screens	5.9	12.8	18.0	30.4	166.7	15.3 (11.3 – 19.5)	16.0 (12.4 – 19.7)
11-15mm	2	22	30	8	0	52	62
	16.7%	31.0%	34.1%	36.4%	0.0%	32.7%	31.6%
Rate/10,000 screens	3.9	11.3	17.5	22.1	0.0	14.2 (10.3 – 18.0)	13.6 (10.2 – 17.0)
>15mm	7	24	24	2	0	48	57
	58.2%	33.8%	27.3%	9.1%	0.0%	30.2%	29.1%
Rate/10,000 screens	13.8	12.3	14.0	5.5	0.0	13.1 (9.4 – 16.8)	12.5 (9.3 – 15.8)
Unknown	0	0	3	1	0	3	4
	0.0%	0.0%	3.4%	4.5%	0.0%	1.9%	2.0%
Rate/10,000 screens	0.0	0.0	1.7	2.8	0.0	0.8	0.9
Subtotal	12	71	88	22	3	159	196
	100%	100%	100%	100%	100%	100%	100%
Rate/10,000 screens	23.7	36.4	51.2	60.8	166.7	43.4 (36.6 – 50.1)	43.0 (37.0 – 49.0)

2.6 Breast cancer characteristics and treatment

2.6.1 Nodal status

For women diagnosed with breast cancer (invasive and DCIS) who underwent axillary lymph node dissection, the number of positive nodes were recorded. Of the 268 women with invasive cancer, 246 had pathology results from axillary dissection or lymph node sampling. Table 28 shows that there is a strong association between tumour size and the number of women with positive nodes. Nodes were positive for 24% of these 246 women, but where the tumour size was greater than 15mm, 35.3% of women had positive nodes. Conversely, only 9.5% of the women with cancers ≤ 10 mm had positive nodes. Of the 17 women with DCIS who had an axillary dissection or lymph node sampling, none had positive nodes.

Table 28 Nodal status and size of tumour

Nodal status	Invasive size (mm)				Invasive total	DCIS	Total		
	0-10	11 – 15	>15	Unknown					
No dissection	14	2	3	3	22	54	76		
Dissection	No nodes positive		67	65	55	0	187	17	204
			90.5%	77.4%	64.7%	0.0%	76.0%	100%	77.6%
	Nodes positive		7	19	30	3	59	0	59
			9.5%	22.6%	35.3%	100.0%	24.0%	0.0%	22.4%
Subtotal	74	84	85	3	246	17	263		
	100%	100%	100%	100%	100%	100%	100%		
Total number of cancers	88	86	88	6	268	71	339		



2.6.2 Tumour grade

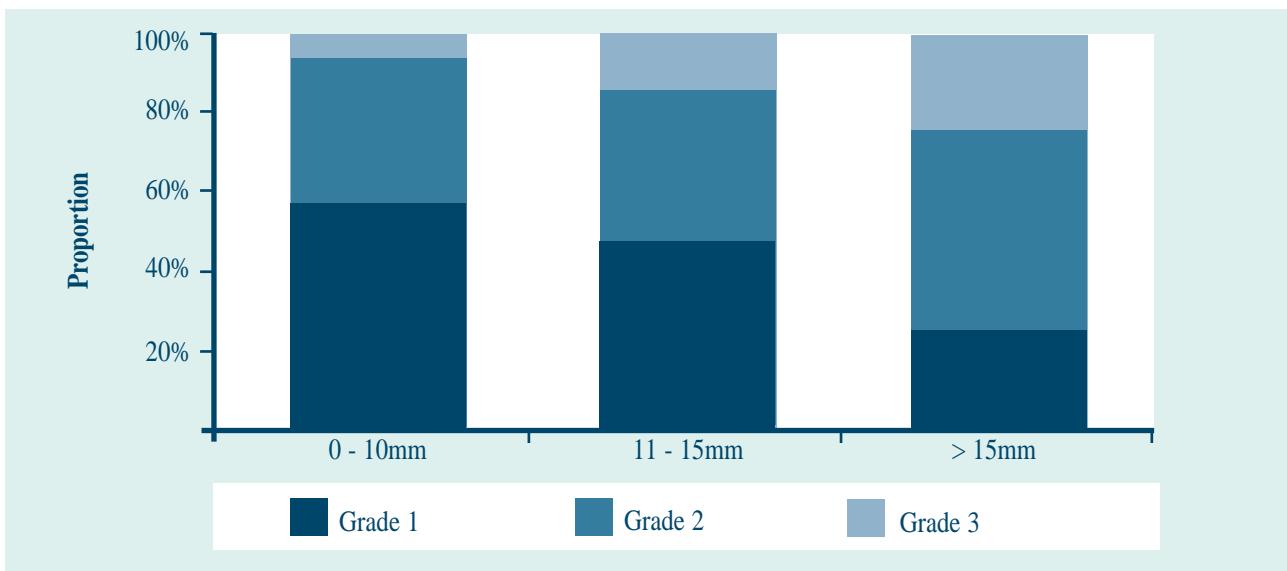
Table 29 shows the histological grade of screen-detected cancers in relation to tumour size for 268 cases of invasive cancer. Histology was not available in two cases where no surgical treatment was performed and for nine cases the grade was unknown or not assessed. Six of these nine cases were lobular cancers.

Table 29 Histological grade of tumour by size of tumour

Grade	Invasive Cancer Tumour Size				Total
	<=10mm	11-15mm	>15mm	Unknown size or type	
Grade 1	49 55.7%	41 47.7%	23 26.1%	1 16.7%	114 42.5%
Grade 2	30 34.1%	32 37.2%	41 46.6%	2 33.3%	105 39.2%
Grade 3	6 6.8%	12 14.0%	20 22.7%	0 0.0%	38 14.2%
Not assessable or not known	3 3.4%	1 1.2%	4 4.5%	1 16.7%	9 3.4%
No local excision	0 0.0%	0 0.0%	0 0.0%	2 33.3%	2 0.7%
Total	88 100%	86 100%	88 100%	6 100%	268 100%

Of all tumours <= 10mm, 55.7% were classified grade 1, and of tumours greater than 15mm, 26.1% were classified grade 1. Figure 2.5 illustrates the relationship between grade and size of tumour, for tumours with an assessable grade. The larger tumour size has a higher percentage of grade 3 tumours.

Figure 2.5 Tumour grade by size



2.6.3 Treatment type

Treatment type was recorded for all women with invasive breast cancer. Of these, 26.3% had a mastectomy, 72.9% had a wide local excision for breast conserving surgery and 0.9% had no surgery. Patterns of treatment are very similar for women living in areas classified as rural or remote compared with women living in urban areas. The slight preference for mastectomy in rural areas reported in the 1997 data is not evident in the 1998 data. Of women with DCIS, 66.2% had breast-conserving surgery and 33.8% underwent mastectomy.

Table 30 Treatment of breast cancer by cancer type

Treatment	Invasive	DCIS	Total
Urban - Adelaide			
No surgery	2 1.0%	0 0.0%	2 0.8%
Complete local excision	150 75.8%	35 64.8%	185 73.4%
Mastectomy	46 23.2%	19 35.2%	65 25.8%
Subtotal	198 100%	54 100%	252 100%
Rural and remote			
No surgery	1 1.4%	0 0.0%	1 1.1%
Complete local excision	50 71.4%	12 70.6%	62 71.3%
Mastectomy	19 27.1%	5 29.4%	24 27.6%
Subtotal	70 100%	17 100%	87 100%
All areas			
No surgery	3 1.1%	0 0.0%	3 0.9%
Complete local excision	200 74.6%	47 66.2%	247 72.9%
Mastectomy	65 24.3%	24 33.8%	89 26.3%
Total	268 100%	71 100%	339 100%



2.7 Interval cancers and program sensitivity

2.7.1 Interval cancers

Interval cancers are cancers that are diagnosed between screening episodes. Mammography cannot detect all breast cancers and there will be a number that present between screening episodes. While interval cancers reduce the beneficial effect of screening on mortality, there will always be some cancers that are less likely to be detected by screening. It is expected that the number of interval cancers will be higher in the second year following screening.⁸

The interval cancer rate presented in this section for women screened during 1996 is calculated using the equation and criteria recommended by the National Breast Cancer Centre (NBCC).⁹

$$\frac{\text{Number of interval breast cancers x 10,000}}{\text{Number of women years at risk}}$$

In Table 31 the following criteria apply:

- Interval breast cancers include invasive cancers only. DCIS, lobular carcinoma in situ (LCIS) or Paget's disease are not included, unless there is evidence of underlying invasive cancer. Women with previous breast cancer are not excluded.
- Only South Australian residents who have not had breast cancer previously are included in the "women years at risk" population.
- Within Year 2 the "at risk" population also excludes all women recommended for annual rescreening, which in 1996 for the South Australian program related to women aged under 50 with a strong family history of breast cancer.
- The NBCC recommend that data is stratified by symptom status, age and screening round and year of screen.

It is BreastScreen SA policy that if any woman reports a symptom, and she has a normal mammogram, then she will be advised to visit her general practitioner for further investigation of her symptom. If this woman is subsequently diagnosed with breast cancer, her breast cancer will be reported as an interval cancer.

The interval cancer rates and program sensitivity for symptomatic women are not presented in a table in this report, as the numbers are too low for meaningful interpretation.

Of 1,582 symptomatic women screened during 1996, no invasive interval cancers were detected during the first year and three were detected during the second year.

Table 31 relates to asymptomatic women who were screened during 1996 but then developed an interval cancer during the first or second year after that screen. The table shows:

- There is an increase in the interval cancer rate during the second year for women of all age groups.
- There is little difference in the interval cancer rates between women having a first screen and women having a subsequent screen for both Year 1 and Year 2.

⁸ Dixon J Michael (ed). *ABC of Breast Disease*. London: BMJ Publishing; 1995.

⁹ Kavanagh AM, Amos AF, Marr GM. *The ascertainment and reporting of interval cancers within the BreastScreen Australia Program*. Kings Cross (NSW): NHMRC National Breast Cancer Centre; 1999.



Table 31 Interval cancer rates during Year 1 and Year 2 of asymptomatic women screened during 1996 by age

Type of attendance	AGE GROUP				50-69	Total Av. Rate (95% C.I)
	40-49	50-59	60-69	70+		
Year 1 – Asymptomatic women						
First screen						
Number of women years at risk	3597	5761	2866	1166	8627	13390
Number of interval cancers	2	5	1	0	6	8
Rate per 10,000 women	5.5	8.7	3.5	0.0	7.0	6.0 (1.8-10.1)
Subsequent screen						
Number of women years at risk	4636	14082	13067	1397	27149	33182
Number of interval cancers	2	9	11	0	20	22
Rate per 10,000 women	4.3	6.4	8.4	0.0	7.4	6.6 (3.9-9.4)
Total screens						
Number of women years at risk	8233	19843	15933	2563	35776	46572
Number of interval cancers	4	14	12	0	26	29
Rate per 10,000 women	4.9	7.1	7.5	0.0	7.3	6.4 (4.1-8.7)
Year 2 – Asymptomatic women						
First screen						
Number of women years at risk	3365	5761	2866	1166	8627	13158
Number of interval cancers	4	9	1	0	10	14
Rate per 10,000 women	11.9	15.6	3.5	0.0	11.6	10.6 (5.1-16.2)
Subsequent screen						
Number of women years at risk	4094	14082	13067	1397	27149	32640
Number of interval cancers	4	15	16	0	31	35
Rate per 10,000 women	9.8	10.7	12.2	0.0	11.4	10.7 (7.2-14.3)
Total screens						
Number of women years at risk	7459	19843	15933	2563	35776	45798
Number of interval cancers	8	24	17	0	41	49
Rate per 10,000 women	10.7	12.1	10.7	0.0	11.5	10.7 (7.7-13.7)

2.7.2 Program sensitivity

Program sensitivity measures how effective the BreastScreen program is at detecting the presence of breast cancer in well women. It is an indicator recommended for use by the NBCC. Sensitivity is estimated by comparing the number of invasive breast cancers that are detected within the BreastScreen program during the reporting period with all breast cancers detected (interval plus screen-detected cancers), and is calculated thus:

$$\frac{\text{number of screen-detected invasive cancers}}{\text{number of screen detected invasive cancers + the number of interval invasive cancers}}$$

Sensitivity is stratified by symptom status, age group and screening round. The follow-up period is for the first year and for the first and second year combined. The definition of interval cancer and the inclusion criteria are the same as those mentioned in the previous section.

The program sensitivity for women who reported a symptom at screening are not presented in this report because the figures are too low for meaningful interpretation. More information on program sensitivity is in the NBCC report by Kavanagh et al.

Program sensitivity only includes invasive breast cancer and not ductal carcinoma in situ (DCIS), lobular carcinoma in situ (LCIS) or Paget's disease.

It is evident from Table 32 that for women screened during 1996, the program sensitivity measure is higher for first-screen women compared to subsequent-screen women during both Year 1 and Years 1 and 2 combined.

Table 32 Program sensitivity during Year 1 and Year 2 combined of asymptomatic women screened during 1996

Type of attendance	AGE GROUP					Total
	40-49	50-59	60-69	70+	50-69	
Year 1						
First screen						
Number of screen-detected invasive cancers	8	27	25	11	52	71
Number of interval invasive cancers	2	5	1	0	6	8
Program sensitivity	80.0%	84.4%	96.2%	100.0%	89.7%	89.9%
Subsequent screen						
Number of screen-detected invasive cancers	7	40	51	12	91	110
Number of interval invasive cancers	2	9	11	0	20	22
Program sensitivity	77.8%	81.6%	82.3%	100%	82.0%	83.3%
Total screens						
Number of screen-detected invasive cancers	15	67	76	23	143	181
Number of interval invasive cancers	4	14	12	0	26	30
Program sensitivity	78.9%	82.7%	86.4%	100.0%	84.6%	85.8%
Combined Year 1 and Year 2 Asymptomatic women						
First screen						
Number of screen-detected invasive cancers	8	27	25	11	52	71
Number of interval invasive cancers	6	14	2	0	16	22
Program sensitivity	57.1%	65.9%	92.6%	100.0%	76.5%	76.3%
Subsequent screen						
Number of screen-detected invasive cancers	7	40	51	12	91	110
Number of interval invasive cancers	6	24	27	0	51	57
Program sensitivity	53.8%	62.5%	65.4%	100.0%	64.1%	65.9%
Total screens						
Number of screen-detected invasive cancers	15	67	76	23	143	181
Number of interval invasive cancers	12	38	29	0	67	79
Program sensitivity	55.6%	63.8%	72.4%	100.0%	68.1%	69.6%



2.8 *Further Information*

For further information, please contact:

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2.9 *Acronyms*

- ABS Australian Bureau of Statistics
- CALD Culturally and linguistically diverse
- DCIS Ductal carcinoma in-situ
- FNAB Fine needle aspiration biopsy
- QA Quality assurance



