BreastScreen SA At 10 Years

(incorporating the 1997 Statistical Report)

Department of Human Services
BreastScreen SOUTH AUSTRALIA
A joint Commonwealth/State and Territory Program

BreastScreen SA
At 10 Years

(incorporating the
1997 Statistical Report)

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Report Summary

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

The report is divided into three sections. Section One provides a description of BreastScreen SA, and includes information relating to details of service provision, the target population for screening, recruitment strategies, the screening and assessment pathway, and quality assurance and training.

In Section Two, an outline of BreastScreen SA at 10 Years includes a brief history, service landmarks and key statistics from 1989 to 1997.

Section Three contains the 1997 Statistical Report, and provides information on screening profiles and the results of the screening and assessment processes. Comparison is made throughout this report of BreastScreen SA's performance against the relevant objectives of the National Accreditation Requirements.

In the future, statistical reports will be produced annually to present comparable data so that trends can be identified.

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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Description of

BreastScreen SA

1. 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 attributable to breast cancer, by providing a free government screening mammography service on a statewide basis. Asymptomatic women aged 40 and over are eligible to attend. However, the service primarily targets women aged 50 to 69.

In March 1994, BreastScreen SA was the first service in Australia to achieve full accreditation by the national program. In April 1997, the service was the first to be fully re-accredited. The comprehensive set of national accreditation requirements include standards relating 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.

Compliance with the national accreditation requirements is critical to maintain the high standards necessary to achieve the desired aim of the program. It also sends a very positive message to clients, who can expect an excellent standard of service throughout the screening and assessment process. Past and present staff of BreastScreen SA are credited with establishing the high quality program in South Australia.

1.2 Service provision

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 the purpose of mammography screening and assessment.

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

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 well served by two mobile x-ray units, which visit 26 country regions every two years, the recommended screening interval (see Figures 1 and 2).

A central assessment clinic at Wayville caters for investigation 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

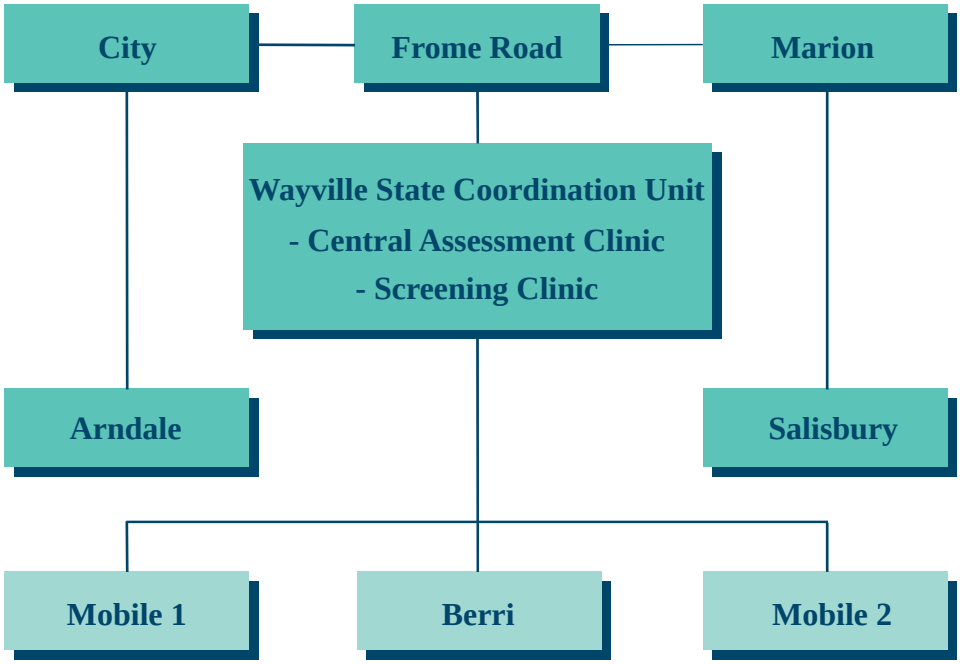
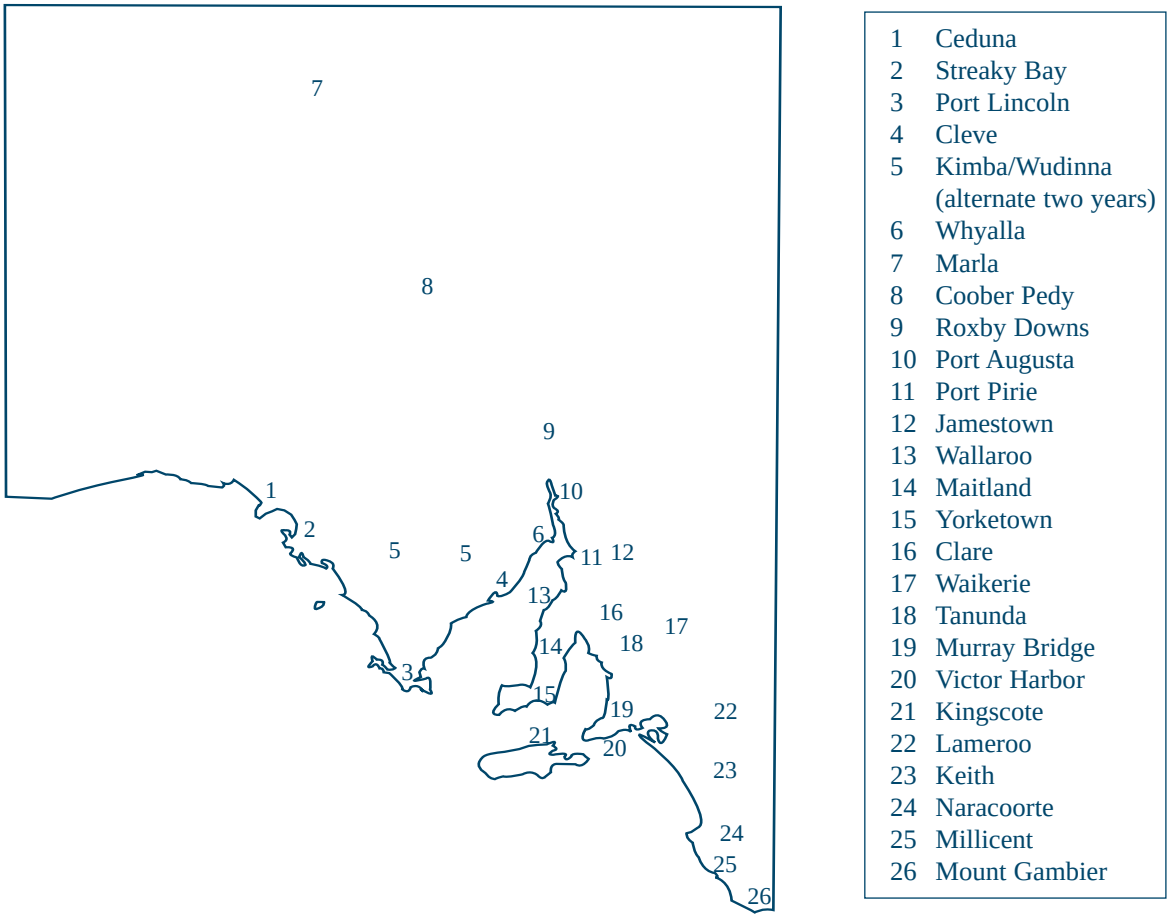


Figure 1.2 BreastScreen SA mobile unit locations



1.3 Screening and the target population

Screening is the process of looking for disease in healthy people who have no symptoms of disease. 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%.[1,2,3] BreastScreen SA re-invites women in the target group when their next mammogram is due.

Research is 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 in this age group that having routine screening mammograms reduces 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:

- A first-degree relative (mother, sister, daughter) 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 past history of breast cancer are also eligible for annual screening at BreastScreen SA if they were diagnosed more than 10 years ago. They are encouraged to see their general practitioner for an annual breast examination.

The effectiveness of the BreastScreen SA program in reducing mortality and morbidity from breast cancer, as well as its planning and funding, are based on maximising participation in screening by the target group. The aim is to screen 70% of women aged 50 to 69 every two years.

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[1] Duffy SW, Tabar L, Fagerbery 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.*

[2] Fletcher SW, Black W, Harris R, Rimer V, Shapiro S. Report of the International Workshop on Screening for Breast Cancer (1993). *Journal of the National Cancer Institute; 85(20): 1644-56.*

[3] 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 targeted to the South Australian community of women over 40 years, particularly those aged 50 to 69. This broad group may be separated into smaller and more specific audiences, including those women:

- residing in metropolitan locations;
- residing in country locations;
- from non-English speaking backgrounds (NESB), and
- of Aboriginal and Torres Strait Islander descent.

The other audiences BreastScreen SA must target are those 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 educate 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 tool for personalised recruitment. The Electoral Commission has granted permission to use this information for recruitment purposes only.

Broad strategies targeting women include promotion 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 NESB 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 cultures 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.

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 a breast symptom are advised to see their general practitioner 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 past 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 work-up. 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 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.

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.

Most 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)

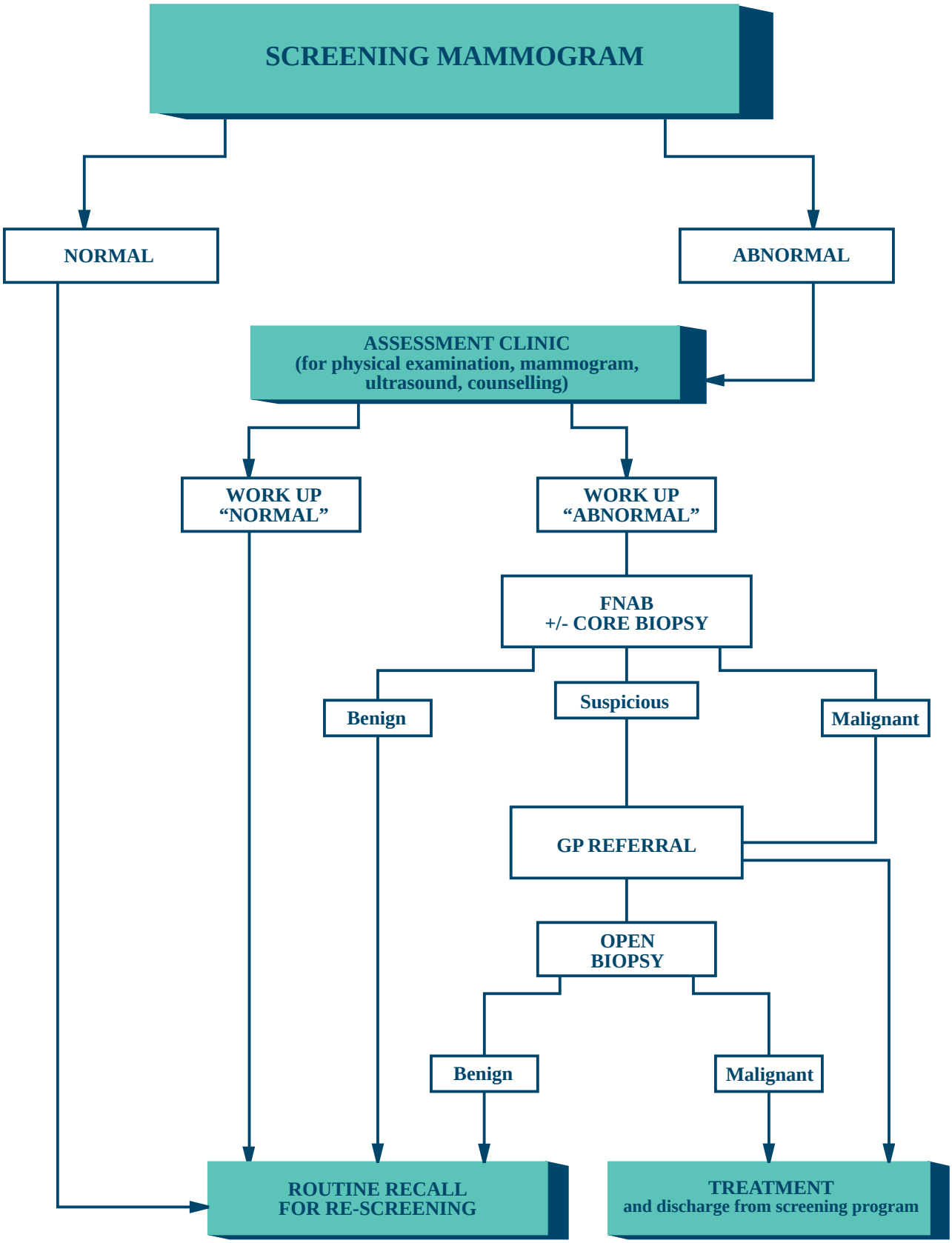
Service performance at BreastScreen SA is continually subjected to intensive quality control and audit processes, to ensure that the program complies with the stringent quality standards of the National Accreditation Requirements.

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 quality assured.

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.

Figure 1.3 The screening and assessment pathway



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 readers.

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.

BreastScreen SA

At 10 Years

2. BreastScreen SA at 10 Years

2.1 A brief history

- November 1988 - The SA Breast X-Ray Service (SABXRS) begins as a pilot screening project.
- January 1989 - Screening begins at The Queen Elizabeth Hospital (TQEH). State Coordination Unit (SCU) located at TQEH.
- April 1989 - Screening begins at the Flinders Medical Centre (FMC).
- May 1989 - Screening begins at the Royal Adelaide Hospital (RAH).
- February 1991 - SABXRS is the first state screening program to sign an agreement with the Commonwealth to participate in the National Program for the Early Detection of Breast Cancer (now called BreastScreen Australia).
- June 1991 - SCU moves from TQEH to new accommodation located at 1 Goodwood Road, Wayville.
- October 1991 - Screening begins at the Lyell McEwin Health Service.
- October 1991 - New dedicated Wayville Screening and Assessment Clinic officially opens. Existing assessment arrangements at the three teaching hospitals merge in this one centre.
- April 1992 - First day of screening on Mobile Unit 1 in Clare.
- April 1992 - Screening begins at Marion Clinic (replacing clinic at FMC).
- October 1992 - Screening begins at Rundle Mall Clinic (replacing clinic at RAH).
- October 1994 - First day of screening on Mobile Unit 2 in Kangaroo Island.
- October 1994 - Screening begins at Westfield Shoppingtown Arndale Clinic (replacing clinic at TQEH).
- January 1995 - Screening begins at the Riverland Regional Health Service in Berri, the first fixed breast cancer screening clinic in rural South Australia.
- March 1995 - Screening begins at Frome Road Training Clinic.
- May 1995 - SABXRS recognises its 100,000th client.
- September 1995 - Screening begins at the Salisbury Clinic (replacing the clinic at the Lyell McEwin Health Service).
- March 1996 - SABXRS provides its 200,000th mammogram.
- March 1996 - New Screening and Assessment Clinic at Wayville opens.
- **January 1997 - SA Breast X-Ray Service changes its name to BreastScreen SA.**
- September 1997 - New City Clinic opens in Twin Plaza Arcade, Adelaide (ultimately replacing the Rundle Mall Clinic).

2.2 Service landmarks

- September 1992 - BreastScreen SA's computer system is chosen as the preferred system to meet the national screening program requirements. The Commonwealth purchases the SA system with a view to offering it to other states.

- March 1994 - BreastScreen SA is the first service in Australia to achieve full accreditation under the National Accreditation Requirements of BreastScreen Australia.

- November 1994 - A National Review of the costs of screening mammography in Australia indicates that of all the services reviewed, BreastScreen SA is operating at the lowest cost.

- March 1995 - The Frome Road Screening and Training Clinic is established as a joint venture between BreastScreen SA and the University of South Australia's School of Medical Radiations. Screening, and both academic and clinical instruction are offered on campus - a "first" in mammography training in Australia.

- March 1996 - A summary of BreastScreen SA's clinical performance over its first five years of operation is published in the 1 March edition of the British Journal of Cancer. The paper demonstrates that the SA program is performing at the same level as successful overseas programs. Very importantly, it also shows that BreastScreen SA is meeting the performance standards proposed by international researchers as necessary to bring about a substantial reduction in breast cancer mortality.[4]

- July 1996 - The results of a collaborative study undertaken by BreastScreen SA and the South Australian Cancer Registry in 1995, indicate that the projected cumulative mortality rate, based on tumour diameters at diagnosis and nodal status, was 27% lower at 14 years from diagnosis among cases screened through the South Australian program than among the matched controls.[5]

- April 1997 - BreastScreen SA is the first screening service to achieve full re-accreditation.

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[4] Robinson JI, Crane CEB, King JM, Scarce DI, Hoffman CEJ. The South Australian Breast X-Ray Service: results from a statewide mammographic screening program. *British Journal of Cancer (1996), 73, 837-42.*

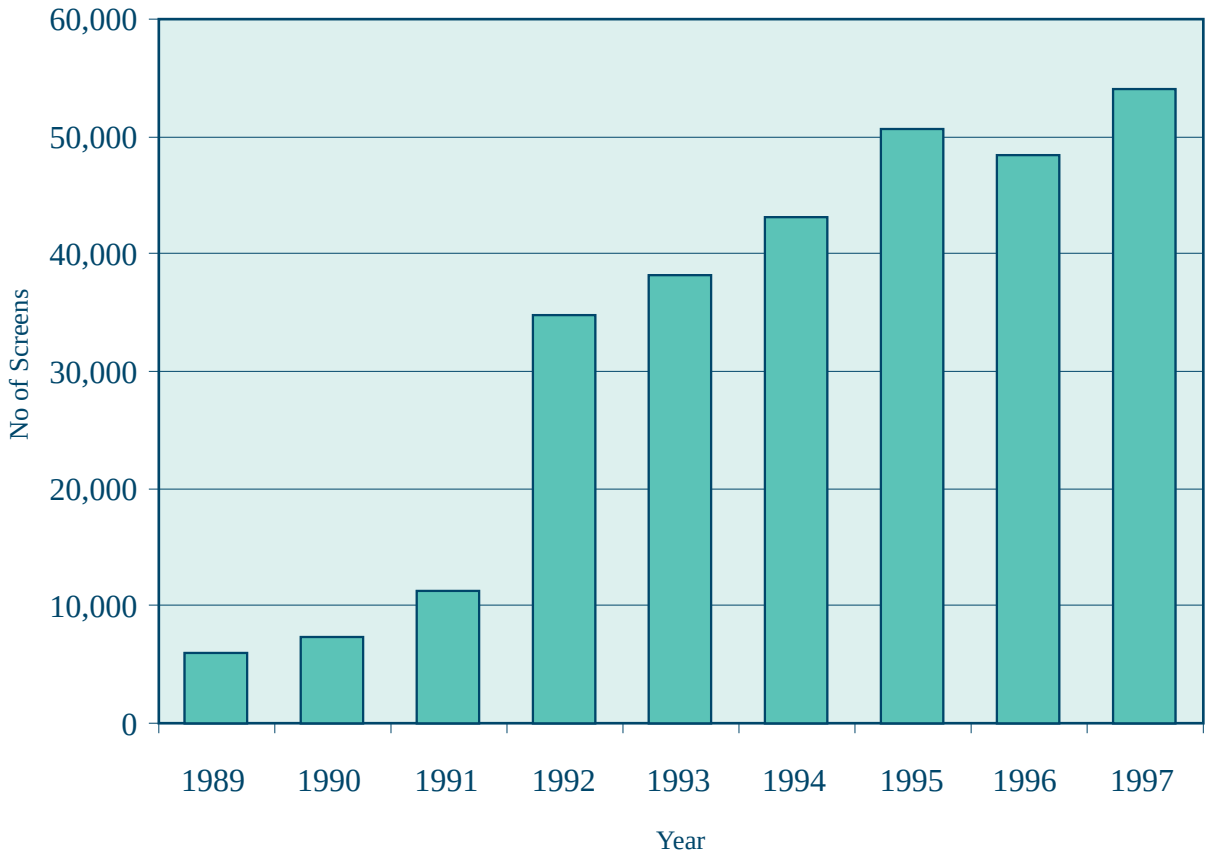
[5] South Australian Cancer Registry (1996). Epidemiology of Cancer in South Australia 1977-1995. *Department of Human Services.*

2.3 Key statistics 1989 to 1997

2.3.1 Screening

Since screening commenced in January 1989, there has been a steady increase in the number of women attending BreastScreen SA for regular screening mammograms.* The program has grown from nearly 6,000 screens during the first year of operation, to 54,080 screens in 1997. To the end of 1997, a total of 140,397 women had 293,679 mammograms with BreastScreen SA (Figure 2.1, Table 2.1).

Figure 2.1 Screening attendance by year



2.3.2 Assessment

The proportion of women recalled for assessment of screen-detected abnormalities at the Wayville Assessment Clinic has decreased (Table 2.1, Figure 2.2). This is primarily due to the high level of expertise developed by radiologists reading the mammograms. During the first year of operation, 11.2% of all women screened attended for further investigation at the Assessment Clinic. By 1997, the recall rate had reduced to 2.6% (Table 2.1, Figure 2.2).

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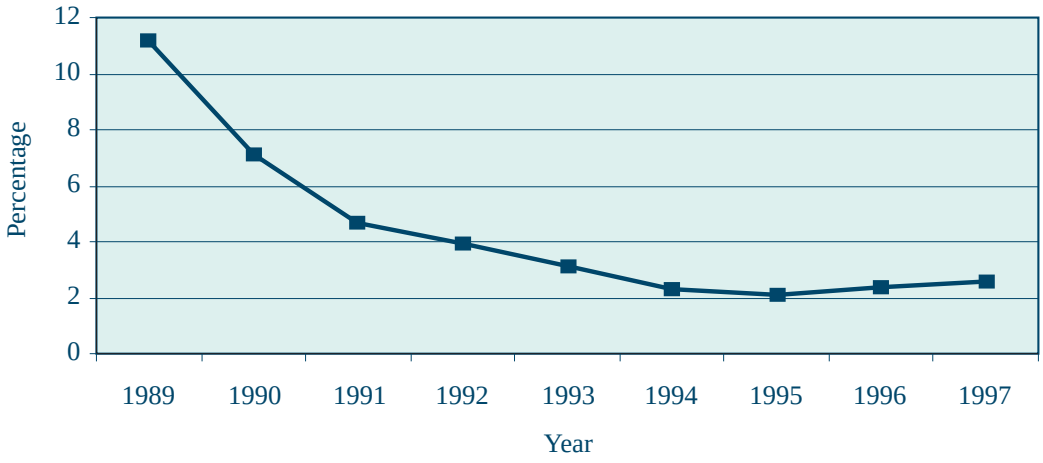
* During 1996, screening numbers were reduced due to renovations of the BreastScreen SA Screening and Assessment Clinic at Wayville.

Table 2.1 Screening and assessment figures 1989 to 1997

Year	Total Screens	Cumulative Total	No of Women Assessed	% Recall Rate to Assessment
1989	5,929	5,929	663	11.18
1990	7,407	13,336	528	7.13
1991	11,189	24,525	526	4.70
1992	34,845	59,370	1345	3.86
1993	38,255	97,625	1193	3.12
1994	43,050	140,675	991	2.30
1995	50,548	191,223	1182	2.34
1996	48,376	239,599	1174	2.43
1997	54,080	293,679	1405	2.60
Total	**293,679**		**9,007**	**3.07**

Figure 2.2 Percentage of women recalled to the assessment clinic by year



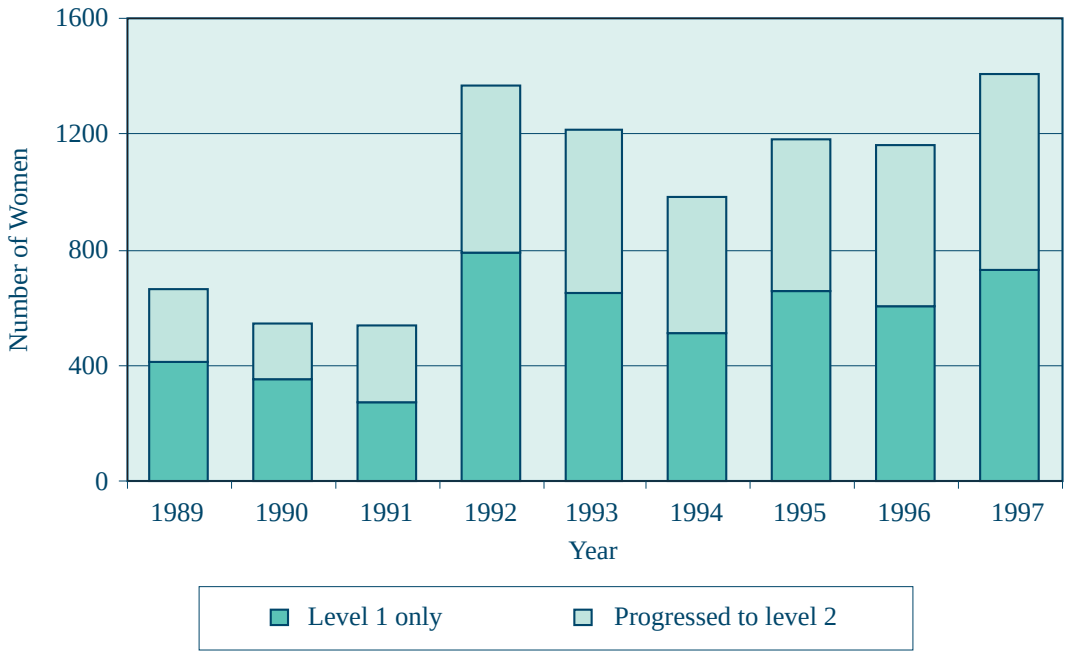
BreastScreen SA uses the internationally accepted triple assessment process, which involves imaging, clinical assessment and pathology. The Assessment Clinic is undertaken in two levels.

All recalled women attend Level 1 Assessment, which consists of further mammography, ultrasound, and clinical breast examination by a medical officer.

Level 2 Assessment is for women whose further imaging indicates 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.

Figure 2.3 illustrates the number of women who attended each level of assessment.

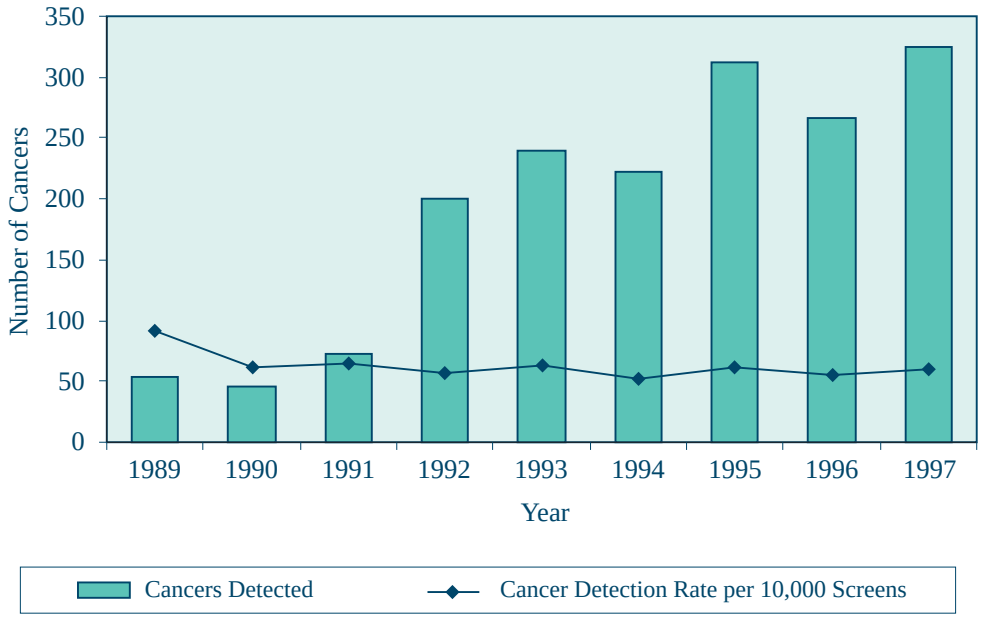
Figure 2.3 BreastScreen SA assessment attendance by year



2.3.3 Cancer detection

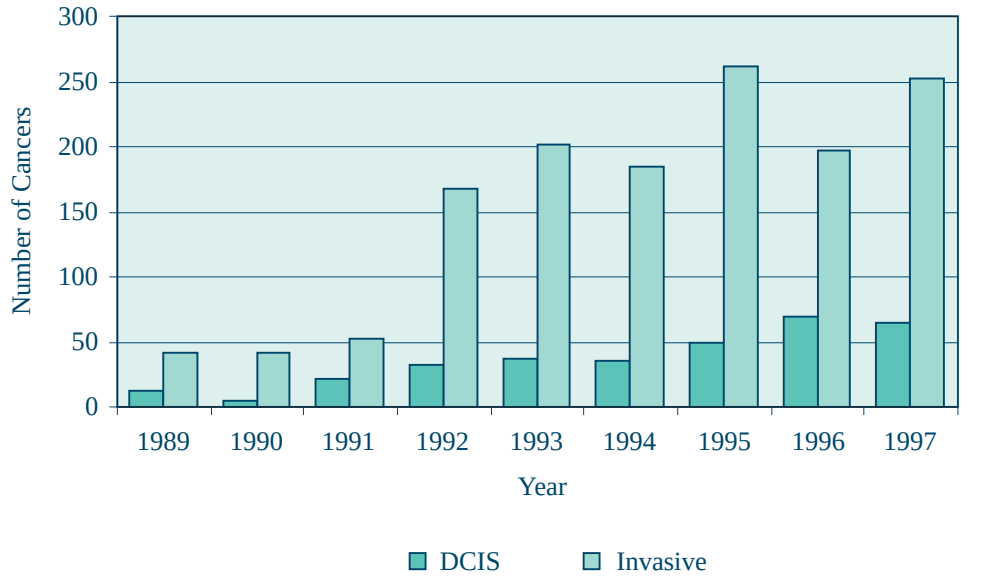
During the first year of operation, the cancer detection rate was high, as would be expected, because of the large number of women participating in mammography screening for the first time. By 31 December 1997, the cancer detection rate was 59 cancers per 10,000 women screened (Figure 2.4).

Figure 2.4 Numbers of cancers detected and cancer detection rate per 10,000 screens by year



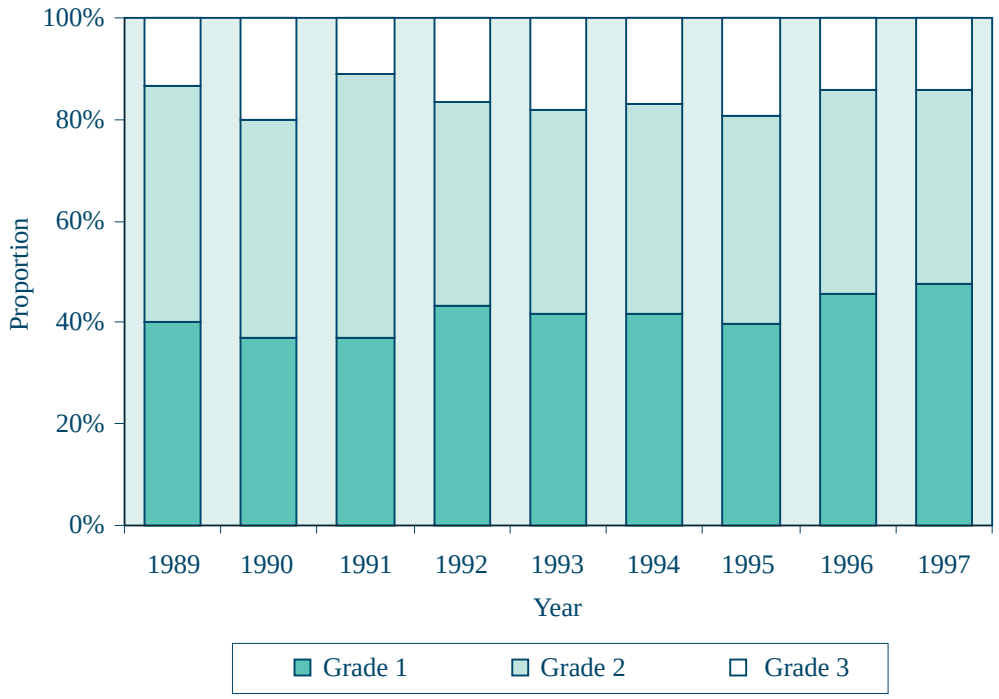
It is also important to monitor the proportion of invasive cancer to ductal carcinoma in-situ (DCIS), as well as the grade and size of the invasive cancers. Figure 2.5 indicates the numbers of invasive and in-situ cancers detected by BreastScreen SA. A significant number of cancers are in-situ only.

Figure 2.5 Cancer detection: invasive and DCIS by year



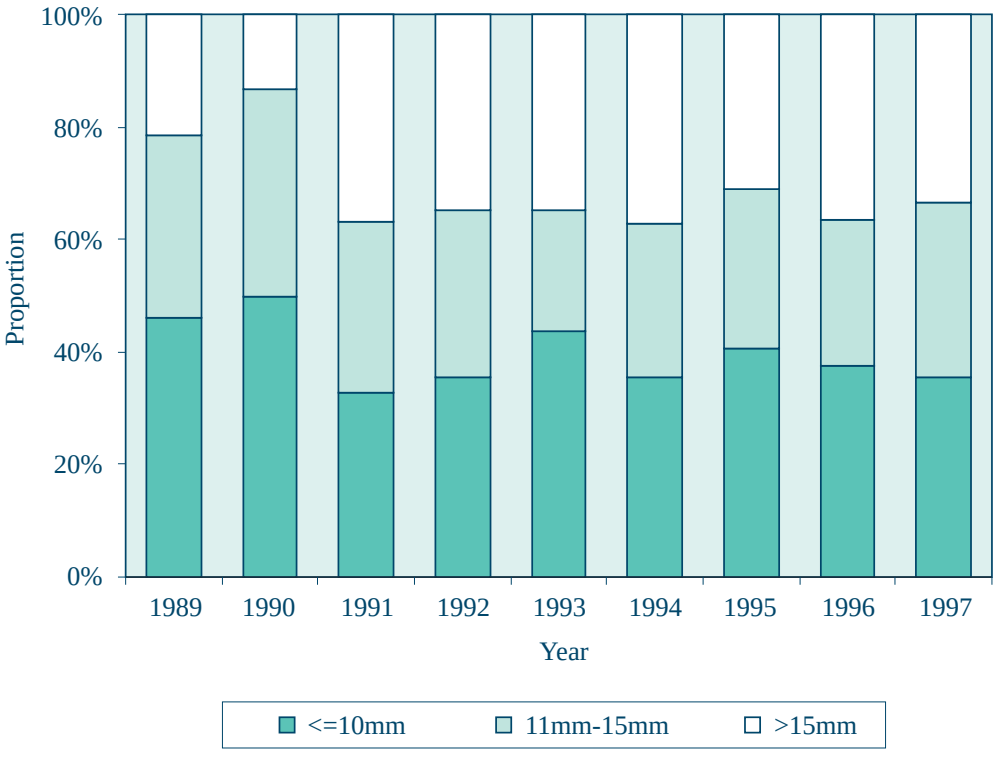
Figures 2.6 and 2.7 indicate that for invasive cancers, the proportion of tumour grade and size varied little from year to year.

Figure 2.6 Invasive cancers by grade by year



The aim of the screening program is to detect a high proportion of small cancers which have a better prognosis. This is being achieved, as shown in Figure 2.7.

Figure 2.7 Invasive cancers by size by year



2.3.4 Interval cancers

The aim of a screening program is to reduce mortality from breast cancer by early detection of the disease before spread has occurred. Mammography cannot detect all breast cancers and there will be a number presenting between screening episodes. The number of cancers presenting between screens (the interval cancers) reduces the beneficial effect of screening on mortality. It is to be expected that the number of such interval cancers will be higher in the second year following screening.

The calculation method for the interval cancer rate is currently under national review. For the purposes of this report, the National Accreditation Requirement has been used, with the rate being calculated by dividing the number of interval cancers notified during the nominated period (Year 1 or Year 2), by the number of women screened during the calendar year under review. Only invasive cancers for all women screened have been included in the calculation.

Table 2.2 Interval cancer rates by year (with Confidence Intervals)

Year of Screen	Total Screens	Interval Cancers presenting during Year 1	Interval Cancer Rate during Year 1 per 10,000 women screened (95% CI)	Interval Cancers presenting during Year 2	Interval Cancer Rate during Year 2 per 10,000 women screened (95% CI)
1989	5,929	1	1.69 (0 - 5.0)	3	5.06 (0 - 10.8)
1990	7,407	5	6.75 (0.8 - 12.7)	5	6.75 (0.8 - 12.7)
1991	11,189	5	4.47 (0.6 - 8.4)	12	10.72 (4.7 - 16.8)
1992	34,845	23	6.60 (3.9 - 9.3)	35	10.04 (6.7 - 13.4)
1993	38,255	19	4.97 (2.7 - 7.2)	46	12.05 (8.6 - 15.5)
1994	43,050	40	9.29 (6.4 - 12.2)	38	8.83 (6.0 - 11.6)
1995	50,548	24	4.75 (2.9 - 6.7)	55	10.88 (8.0 - 13.8)
Total	**191,223**	**117**	**6.12** (5.0 - 7.2)	**194**	**10.15** (8.7 - 11.6)

There are various factors which affect the interval cancer rate. For example, women with a strong family history of breast cancer or a previous history of breast cancer are considered to be at a higher risk of developing the disease, and are therefore invited for annual screening. This group of women represents less than 5% of all women screened.

If a woman reports a symptom, but has a normal mammogram, 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 South Australian Cancer Registry provides, for the whole of the state, one of the most timely and comprehensive data sets for cancer reporting in Australia.

2.3.5 Program sensitivity

Program sensitivity can be used to measure the effectiveness of a screening program. It is calculated using the following formula:

$$\frac{\text{Screen-detected invasive cancers}}{\text{Screen-detected invasive cancers + Invasive interval cancers}}$$

For the purposes of this report, program sensitivity is calculated by incorporating interval cancers presenting within the first 12 months from screening (Program Sensitivity Measure A) and then separately for interval cancers presenting between 13 and 24 months from screening (Program Sensitivity Measure B). The reporting period incorporates all women screened between 1/1/89 and 31/12/95 and the results are set out below.

Program Sensitivity Measure A

$$\frac{948 \text{ invasive screen-detected cancers}}{948 \text{ invasive screen-detected cancers} + 117 \text{ invasive interval cancers}}$$

Program Sensitivity Measure A= 89%

Program Sensitivity Measure B

$$\frac{948 \text{ invasive screen-detected cancers}}{948 \text{ invasive screen-detected cancers} + 194 \text{ invasive interval cancers}}$$

Program Sensitivity Measure B = 83%

The measure of "program sensitivity" has not so far been linked to mortality reduction in other studies, but it provides a more easily understood measure of the effectiveness of a screening program.

The 1997 Statistical Report includes more detail with stratification by age and round.

1997

Statistical Report

3. 1997 Statistical Report

3.1 Summary

Attendance

There were 54,080 screens at BreastScreen SA during 1997, the highest number of annual screens since the program began. The target age group 50 to 69 years comprised 79% of total screens. Women returning for a subsequent screen comprised 76% of all screens.

Demography

One third of the women screened were born overseas. Thirteen percent usually spoke a language other than English at home, and 0.6% identified themselves as being of Aboriginal or Torres Strait Island descent. Women in country areas comprised 24% of screens, which is a higher proportion than the representation of the same group in the 1996 Census.

Participation

In 1997, the participation rate for women aged 50 to 69 was 61.1% over a 27-month period. This is above the BreastScreen Australia National Accreditation Requirements standard. Women from non-English speaking backgrounds participate at a slightly lower rate than the total rate.

Recall to assessment

There were 1,407 women recommended for assessment of a screen-detected abnormality in 1997, giving a recall rate of 2.6%. For women attending for a first screen, the recall rate was 3.8%, and for women attending a subsequent screen, 2.2%.

Assessment procedures

At assessment, all women initially underwent either further mammography and/or ultrasound. Forty-eight percent of these women had further assessment. The most common interventional procedure was Fine Needle Aspiration Biopsy.

Breast cancers detected

During 1997, BreastScreen SA detected 317 breast cancers. Of these, 80% were invasive and 20% were DCIS (ductal carcinoma in-situ). The cancer detection rate was 81 per 10,000 women at their first screen and 51 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 1997, the small cancer detection rate was 16 per 10,000 screens.

3.2 Characteristics of women attending for screening

3.2.1 Number of screening mammograms

During 1997, BreastScreen SA provided 54,080 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 1997, 8,103 (15%) of the total number of women screened were aged between 40 and 49, and 42,708 (79%) were aged between 50 and 69 (Table 3.1). The proportion of women who were aged 70 years and over at the time of screening was 6%.

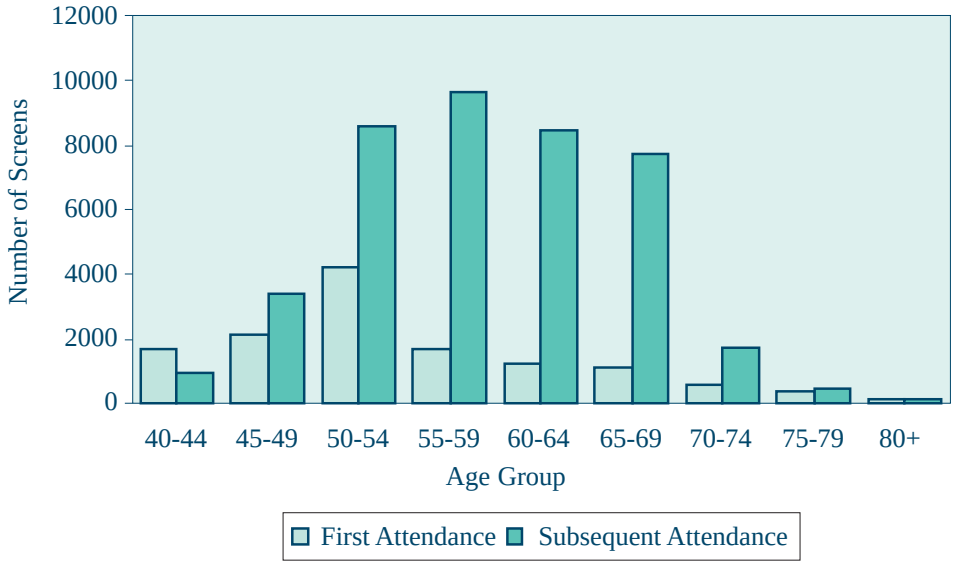
Women attending for the first time made up a total of 13,046 (24%) of these screens. The majority of women, 41,034 (76%) were returning for a subsequent screen. Fifty-nine women attended for their sixth or seventh mammogram with the program. The classification of "first" screen or "subsequent" screen refers to the screening history of the woman within the program. For women attending in 1997 for a first screen, 24.6% reported having a previous mammogram elsewhere within the last five years.

Table 3.1 Screening mammograms for 1997 by attendance and age

	Age group						
Type of attendance	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
First screen	3766 46.5%	5907 24.5%	2372 12.8%	903 29.4%	98 50.3%	8279 19.4%	13046 24.1%
Subsequent screens	4337 53.5%	18226 75.5%	16203 87.2%	2171 70.6%	97 49.7%	34429 80.6%	41034 75.9%
Total Screens	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%
All screens Age distribution	**8103** 15.0%	**24133** 44.6%	**18575** 34.3%	**3074** 5.7%	**195** 0.4%	**42708** 78.9%	**54080** 100.0%

Figure 3.1 shows first and subsequent screens stratified by age of women in five-year age groupings. The single largest number of first screens is in the 50 to 54 age group.

Figure 3.1 Number of women screened by attendance type



3.2.2 Area of residence

In South Australia, the population of women aged 40 years and over lives mainly in or near Adelaide, with 80% residing in Adelaide or Outer Adelaide*. Outer Adelaide stretches from Mallala in the north to Victor Harbor in the south. Another 6.5% of women reside in the six major rural towns of Mt Gambier, Port Pirie, Port Augusta, Port Lincoln, Murray Bridge and Whyalla. A further 11% reside in other rural areas and 1.3% are in regions classified as remote†.

Table 3.2 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 areas visited every two years by two mobile units and constitute 24% of the 1997 total screens. As only 20% 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 3.2 Women screened by area of residence and age

	Age Group						
Residential area	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Adelaide	5815 71.8%	16961 70.3%	13058 70.3%	2121 69.0%	135 69.2%	30019 70.3%	38090 70.4%
Outer Adelaide	409 5.0%	1393 5.8%	970 5.2%	166 5.4%	6 3.1%	2363 5.5%	2944 5.4%
Rural town	781 9.6%	2244 9.3%	1663 9.0%	311 10.1%	26 13.3%	3907 9.1%	5025 9.3%
Other rural	928 11.5%	3256 13.5%	2752 14.8%	458 14.9%	28 14.4%	6008 14.1%	7422 13.7%
Remote	153 1.9%	215 0.9%	100 0.5%	11 0.4%	0 0.0%	315 0.7%	479 0.9%
Interstate	17 0.2%	64 0.3%	32 0.2%	7 0.2%	0 0.0%	96 0.2%	120 0.2%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

* ABS Estimated Residential Population 1997.

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

3.2.3 Country of birth

Of the women screened at BreastScreen SA in 1997, approximately one third were born overseas. This compares favourably with the 1996 census which reports 30% of South Australian women aged 40 and over were born overseas. Of the 17,785 overseas-born women who attended in 1997, 17% were from non-English speaking countries. The majority of clients not born in Australia are from the United Kingdom, Europe and Asia.

Table 3.3 Women screened by country of birth and age

	Age Group						
Country of birth	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Australia	5730 70.7%	15882 65.8%	12098 65.1%	2258 73.5%	160 82.1%	27980 65.5%	36128 66.8%
United Kingdom & Eire	1043 12.9%	4001 16.6%	3031 16.3%	363 11.8%	21 10.8%	7032 16.5%	8459 15.6%
Italy	210 2.6%	996 4.1%	1005 5.4%	85 2.8%	6 3.1%	2001 4.7%	2302 4.3%
Greece	103 1.3%	607 2.5%	488 2.6%	36 1.2%	1 0.5%	1095 2.6%	1235 2.3%
Germany	110 1.4%	444 1.8%	395 2.1%	68 2.2%	0 0.0%	839 1.9%	1017 1.9%
Netherlands	102 1.3%	337 1.4%	223 1.2%	36 1.2%	0 0.0%	560 1.3%	698 1.3%
Other Europe / USSR	264 3.3%	878 3.6%	805 4.3%	145 4.7%	3 1.5%	1683 3.9%	2095 3.9%
Vietnam	148 1.8%	95 0.4%	64 0.3%	12 0.4%	0 0.0%	159 0.4%	319 0.6%
Other South-East Asia	111 1.4%	217 0.9%	72 0.4%	5 0.2%	0 0.0%	289 0.7%	405 0.7%
Other Asia	52 0.6%	164 0.7%	116 0.6%	15 0.5%	0 0.0%	280 0.7%	347 0.6%
Middle East and Africa	80 1.0%	167 0.7%	94 0.5%	19 0.6%	0 0.0%	261 0.6%	360 0.6%
Northern America	31 0.4%	72 0.3%	37 0.2%	7 0.2%	0 0.0%	109 0.3%	147 0.3%
Other	93 1.2%	200 0.8%	92 0.5%	14 0.5%	2 1.0%	292 0.7%	401 0.8%
Not stated	26 0.3%	73 0.3%	55 0.3%	11 0.4%	2 1.0%	128 0.3%	167 0.3%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

3.2.4 Language spoken at home

Over 7,000 women (13%) screened by the program during 1997 reported that they did not usually speak English at home. The majority of these women (83%) were in the target age group 50 to 69. BreastScreen SA provides free interpreter services for women who require assistance for bookings, screening and assessment. During 1997, 86.5% of women screened at BreastScreen SA usually spoke English at home. This compares favourably with the 1996 Census which identified 83.2% of females in South Australia in this age group as speaking only English at home.

Table 3.4 Women screened by language spoken at home and age

	Age Group						
Language spoken at home	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Usually English	7183 88.6%	21013 87.1%	15691 84.5%	2719 88.5%	183 93.8%	36704 85.9%	46789 86.5%
Usually other than English	871 10.8%	3013 12.5%	2787 15.0%	341 11.1%	10 5.1%	5800 13.6%	7022 13.0%
Not stated	49 0.6%	107 0.4%	97 0.5%	14 0.5%	2 1.0%	204 0.5%	269 0.5%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

3.2.5 Indigenous women

In 1997, 315 women screened at BreastScreen SA identified themselves as being of Aboriginal or Torres Strait Islander (ATSI) descent, representing 0.6% of total screens. This compared closely with the 1996 Census which reports 0.5% of South Australian women over 40 years of age identified themselves as being of ATSI descent.

Table 3.5 Indigenous women screened by age

	Age Group						
Indigenous women	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Yes	71 0.9%	131 0.5%	96 0.5%	17 0.6%	0 0.0%	227 0.5%	315 0.6%
No	8003 98.8%	23933 99.2%	18426 99.2%	3045 99.1%	195 100.0%	42359 99.2%	53602 99.1%
Not Stated	29 0.4%	69 0.3%	53 0.3%	12 0.4%	0 0.0%	122 0.3%	163 0.3%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

3.2.6 Women with symptoms

BreastScreen SA is a screening program for asymptomatic women. However, some women do present with a symptom at the time of screening. In the presence of a symptom, if there is no mammographic abnormality, women will be advised to visit their doctor for clinical assessment.

Table 3.6 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.

Table 3.6 Women screened by symptoms and age

	Age Group						
Symptoms	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Breast lump	503 6.2%	725 3.0%	313 1.7%	57 1.9%	5 2.6%	1038 2.4%	1603 3.0%
Nipple discharge	119 1.5%	146 0.6%	55 0.3%	13 0.4%	0 0.0%	201 0.5%	333 0.6%
Other breast symptoms	877 10.8%	1463 6.1%	904 4.9%	278 9.0%	17 8.7%	2367 5.5%	3539 6.5%
No breast symptoms	6604 81.5%	21799 90.3%	17303 93.2%	2726 88.7%	173 88.7%	39102 91.6%	48605 89.9%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

3.2.7 Family history of breast cancer

In 1997, 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 or daughter) 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 majority of women attending for screening do not have a strong family history of breast cancer.

Table 3.7 Women screened with a family history of breast cancer by age

	Age Group						
Family history of breast cancer	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Strong family history	745 9.2%	860 3.6%	739 4.0%	177 5.8%	21 10.8%	1599 3.7%	2542 4.7%
Other family history	1854 22.9%	3982 16.5%	2749 14.8%	504 16.4%	35 17.9%	6731 15.8%	9124 16.9%
No	5354 66.1%	18943 78.5%	14924 80.3%	2363 76.9%	137 70.3%	33867 79.3%	41721 77.1%
Not stated	150 1.9%	348 1.4%	163 0.9%	30 1.0%	2 1.0%	511 1.2%	693 1.3%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

3.2.8 Personal history of breast cancer

Of all women screened, 212 (0.4%) said they had a personal history of breast cancer. These women are eligible for annual screening if they are not under the regular care of a surgeon, or more than 10 years has elapsed from diagnosis.

3.2.9 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 49.1% of the women aged 50 to 59 and 32.9% of women aged 60 to 69.

Table 3.8 Hormone replacement therapy by age

HRT Use	40-49	50-59	60-69	70-79	80+	50-69	Total
Yes	1990 24.6%	11854 49.1%	6116 32.9%	609 19.8%	15 7.7%	17970 42.1%	20584 38.1%
No	6112 75.4%	12270 50.8%	12449 67.0%	2462 80.1%	180 92.3%	24719 57.9%	33473 61.9%
Unknown	1 0.0%	9 0.0%	10 0.1%	3 0.1%	0 0.0%	19 0.0%	23 0.0%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

3.2.10 Breast implant status

In 1997, there were 274 (0.5%) women screened who had breast implants. Of these, 62 (23%) were aged 40 to 49, 165 (60%) were aged 50 to 59 and 47 (17%) were aged 60 years and older.

Table 3.9 Breast implant status by age

Breast implant status	40-49	50-59	60-69	70-79	80+	50-69	Total
Yes	62 0.8%	165 0.7%	45 0.2%	2 0.1%	0 0.0%	210 0.5%	274 0.5%
No	8041 99.2%	23965 99.3%	18530 99.8%	3072 99.9%	195 100.0%	42495 99.5%	53803 99.5%
Unknown	0 0.0%	3 0.0%	0 0.0%	0 0.0%	0 0.0%	3 0.0%	3 0.0%
Total	**8103** 100%	**24133** 100%	**18575** 100%	**3074** 100%	**195** 100%	**42708** 100%	**54080** 100%

3.2.11 Attendance

Invitations

The majority of women attend BreastScreen SA as a result of a personalised invitation letter, either electoral roll or 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 1997, BreastScreen SA sent 7,492 electoral roll invitations, with 1,806 (24.6%) responding to the letter. Another 7,422 re-invitations for a first screen were sent with a 17% 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 screening. In 1997, "routine recall" invitations were sent to 48,652 women, of whom 34,640 (71.2%) attended. Some women also initiate their own appointments.

Recruitment method

Table 3.10 shows the number of women who responded and made an appointment within three months of receiving an invitation. Only 2,561 (20%) of the 13,046 women attending for the first time did so as a direct response to an electoral roll invitation. For women attending for a subsequent screen, 32,778 (80%) of the 41,034 did so within three months of receiving their "routine recall" invitation.

Table 3.10 Attendance type and response to invitation by age

	Age Group						
Attendance type and response to invitation	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
First screen							
Response within 3 months	39* 1.0%	1539 26.1%	908 38.3%	75 8.3%	0 0.0%	2447 29.6%	2561 19.6%
No invitation or response > 3 months after invitation	3727 99.0%	4368 73.9%	1464 61.7%	828 91.7%	98 100.0%	5832 70.4%	10485 80.4%
Subtotal first screen	**3766** 100%	**5907** 100%	**2372** 100%	**903** 100%	**98** 100%	**8279** 100%	**13046** 100%
Subsequent screens							
Response within 3 months	3122 72.0%	15304 84.0%	14215 87.7%	137 6.3%	0 0.0%	29519 85.7%	32778 79.9%
Response before invitation due or > 3 months after invitation	1215 28.0%	2922 16.0%	1988 12.3%	2034 93.7%	97 100.0%	4910 14.3%	8256 20.1%
Subtotal subsequent screens	**4337** 100%	**18226** 100%	**16203** 100%	**2171** 100%	**97** 100%	**34429** 100%	**41034** 100%

*Women aged under 50 years who postpone a first screen appointment are re-invited at a later date.

3.2.12 Rescreen rates

The rescreen rate is the percentage of women returning for a mammogram within 27 months of a previous screen. According to the 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 1995 were analysed (Table 3.11). Age was calculated at the time of the 1997 screen.

Table 3.11 Rescreen rates by age

	Age Group						
Rescreen Rates	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Women screened in 1995	5984	20040	17973	6209	431	38013	50547
Women returning within 27 months	3304	15499	14432	1307	60	29931	34602
Rescreen rate	**56.1%**	**77.3%**	**80.3%**	**21.1%**	**13.9%**	**78.7%**	**68.5%**

For the target age group, the proportion that returned for a rescreen within 27 months was 78.7%.

3.2.13 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 require more than four films. Occasionally, films have to be repeated because of incorrect positioning, over 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 3.12 Technical repeats by age

	Age Group						
Films	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Total films	38201	116320	90892	14788	938	207212	261139
Repeat films	853	2620	2004	345	32	4624	5854
% Repeat Films	**2.2%**	**2.3%**	**2.2%**	**2.3%**	**3.4%**	**2.2%**	**2.2%**

The technical repeat rate of 2.2% is below the National Accreditation Requirement which specifies that technical repeats should be less than 3% of total films used.

3.2.14 Participation rates

Recruitment activities are directed at ensuring all eligible women, particularly the target age group, have similar opportunities to attend screening. Participation rates are regularly monitored and analysed to identify those groups and areas that might be under-represented. This applies particularly to women from rural areas, ATSI women and women from non-English speaking backgrounds (NESB).

For BreastScreen services operating for at least five years, the National Accreditation Requirements state that a 60% participation rate is required for the 50 to 69 year age group over a 27-month period. In this report the calculation is based on the number of women per age group attending BreastScreen SA in a 27-month period as a proportion of the population of that period. The average of the Estimated Residential Populations of 1996 and 1997, from the Australian Bureau of Statistics is used.

Table 3.13 Participation rates for 27 months by area of residence and age for all women (1 Jan 1996 - 31 March 1998)

		Age Group		
Area of residence		**40-49**	**50-69**	**70-79**
Adelaide Statistical Divisions				
	Population	80314	102858	65719
	Women screened	12865	60388	4578
	Participation rate	**16.0%**	**58.7%**	**7.0%**
Other than Adelaide				
	Population	27487	37715	20565
	Women screened	4857	25453	2205
	Participation rate	**17.7%**	**67.5%**	**10.7%**
Total				
	Population	107801	140573	86284
	Women screened	17722	85841	6783
	Participation rate	**16.4%**	**61.1%**	**7.9%**

The 27-month participation rate for women aged 50 to 69 is 61.1%, which exceeds the minimum required standard. Women in all age groups living outside of Adelaide participate at a higher rate than women residing in the metropolitan area.

The Australian Institute of Health and Welfare recently revised participation rates and now recommends a 24-month period to measure participation. The participation rate for women aged 50 to 69 over a 24-month period using the same population figures was 56.4%.

The National Accreditation Requirement is that in urban areas, the recruitment rate for ATSI women and NESB women will be at least 50% of the rate for the general population. Recruitment activities are directed at the target age group. Population figures for ATSI women for the target age group are from the 1996 census. In urban areas, 29% of ATSI women participated in the 27 months to 31 March 1998, which is 48% of the rate for the general population. In country areas, where two mobile units provide mammograms, the participation rate is higher, with 46% participation by ATSI women aged 50 to 69.

NESB women in the target age group have a lower participation rate compared to the rate for all women. The participation of NESB women attending BreastScreen SA over a 27-month period is presented in Table 3.14. 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 3.13. This means that the NESB participation figures will be an over-estimate of true participation. NESB women follow a similar pattern to all women for participation by area of residence, with rural and remote country participation higher than metropolitan participation.

Table 3.14 Participation rates for 27 months by area of residence and age for NESB women (1 Jan 1996 - 31 March 1998)

	Age Group		
NESB women	**40-49**	**50-69**	**70-79**
Area of Residence			
Adelaide Statistical Divisions	15.6%	**54.3%**	9.6%
Other than Adelaide	17.5%	**59.3%**	14.8%
Total	15.8%	**54.8%**	10.1%

3.3 Screening outcomes

From 54,080 screens in 1997, a total of 1,407 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, 3.8% had a screen-detected abnormality. For subsequent attenders the rate was 2.2%. These recall rates are well below the National Accreditation Requirements standard recall rate of 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. A first screen at BreastScreen SA approximates to the prevalent round. Although the number of women aged 80 and over attending for screening is small, they have a higher recall rate of 7.7%.

Table 3.15 Outcome of screening by attendance and age

	Age Group						
Screening outcomes	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
First Screen							
Routine rescreen	3650 96.9%	5685 96.2%	2272 95.8%	858 95.0%	89 90.8%	7957 96.1%	12554 96.2%
Assessment recommended	116 3.1%	222 3.8%	100 4.2%	45 5.0%	9 9.2%	322 3.9%	492 3.8%
Subtotal first screen	3766 100%	5907 100%	2372 100%	903 100%	98 100%	8279 100%	13046 100%
Subsequent screen							
Routine rescreen	4244 97.9%	17834 97.8%	15841 97.8%	2110 97.2%	91 93.8%	33675 97.8%	40120 97.8%
Assessment recommended	93 2.1%	392 2.2%	362 2.2%	62 2.9%	6 6.2%	754 2.2%	915 2.2%
Subtotal Subsequent screens	4337 100%	18226 100%	16203 100%	2171 100%	97 100%	34429 100%	41034 100%
Total screens	**8103**	**24133**	**18575**	**3074**	**195**	**42708**	**54080**
Total assessments recommended	209	614	462	107	15	1079	1407
Percentage recalled to Assessment	**2.6%**	**2.5%**	**2.5%**	**3.5%**	**7.7%**	**2.5%**	**2.6%**

3.4 Assessment

3.4.1 Procedures

Those women recalled to the assessment clinic undergo further imaging, clinical examination and fine needle aspiration biopsy (FNAB) or core biopsy as required. Cytology results for 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. Most women have more than one procedure in the clinic. Of 1,407 women recommended for assessment, one woman declined to attend and one woman was too ill to attend. Three of the remaining 1,405 women attended for assessment at sites other than BreastScreen SA.

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. In 1997, 48% of women who attended Level 1 assessment needed further assessment at Level 2. This involved an additional clinical examination by a surgeon, and usually a biopsy. This is initially a FNAB, but may lead to a core biopsy.

Table 3.16 Procedures at Level 1 for individual women by age

	Age Group						
Type of assessment	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Level 1							
Further X-rays only	49 23.4%	130 21.2%	89 19.3%	22 20.6%	5 33.3%	219 20.4%	295 21.0%
Ultrasound only	24 11.5%	81 13.2%	65 14.1%	10 9.3%	1 6.7%	146 13.6%	181 12.9%
X-rays + Ultrasound	136 65.1%	402 65.6%	306 66.4%	74 69.2%	9 60.0%	708 65.9%	927 66.0%
Other ‡	0 0.0%	0 0.0%	1 0.2%	1 0.9%	0 0.0%	1 0.1%	2 0.1%
Total Level 1	**209** 100%	**613** 100%	**461** 100%	**107** 100%	**15** 100%	**1074** 100%	**1405** 100%
Women to Level 2 **Percentage of women to Level 2**	**88** 42%	**308** 50%	**207** 45%	**68** 64%	**8** 53%	**515** 48%	**679** 48%

‡ One woman assessed elsewhere had no Level 1 procedures; one woman only required clinical assessment.

Table 3.17 Procedures at Level 2 for individual women by age

	Age Group						
Type of assessment	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Level 2 : Surgical assessment							
Surgical examination only	9	29	10	3	0	39	51
(no radiological abnormality)	10.2%	9.4%	4.8%	4.4%	0.0%	7.6%	7.5%
Biopsies							
FNA only	68	244	159	57	8	403	536
	77.3%	79.2%	76.8%	83.8%	100.0%	78.3%	78.9%
Core only	1	0	1	0	0	1	2
	1.1%	0.0%	0.5%	0.0%	0.0%	0.2%	0.3%
FNA and Core	10	35	37	8	0	72	90
	11.4%	11.4%	17.9%	11.8%	0.0%	14.0%	13.3%
Total Level 2	**88**	**308**	**207**	**68**	**8**	**515**	**679**
	100%	100%	100%	100%	100%	100%	100%

There were 1,405 women who attended for assessment. Figure 3.2 shows the number of women having each of the procedures.

Most women have more than one procedure at assessment. Figure 3.3 summarises the total procedures undertaken. There were 3,734 assessment procedures undertaken for the 1,405 women attending in 1997. The figure shows that further x-rays and ultrasound were the two most frequently used procedures.

Figure 3.2 Number of women undergoing each procedure at assessment

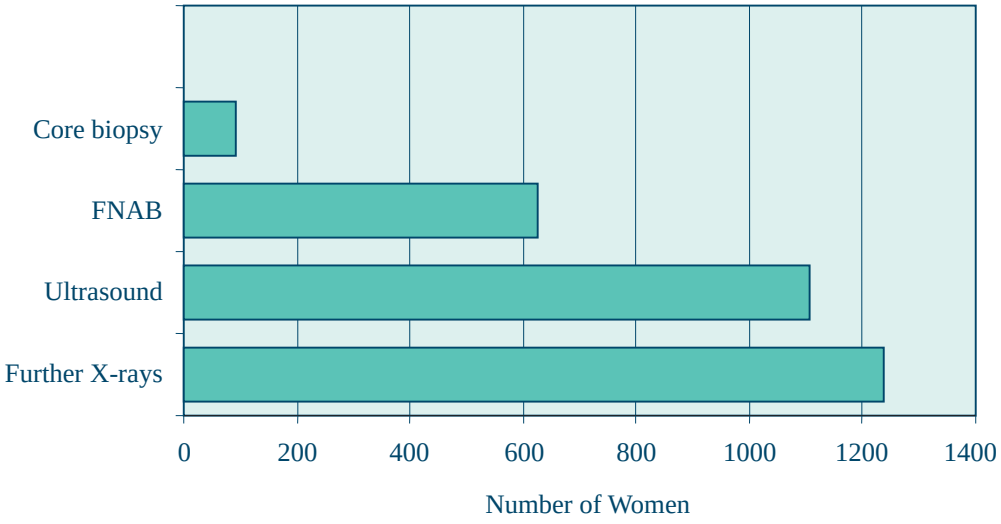
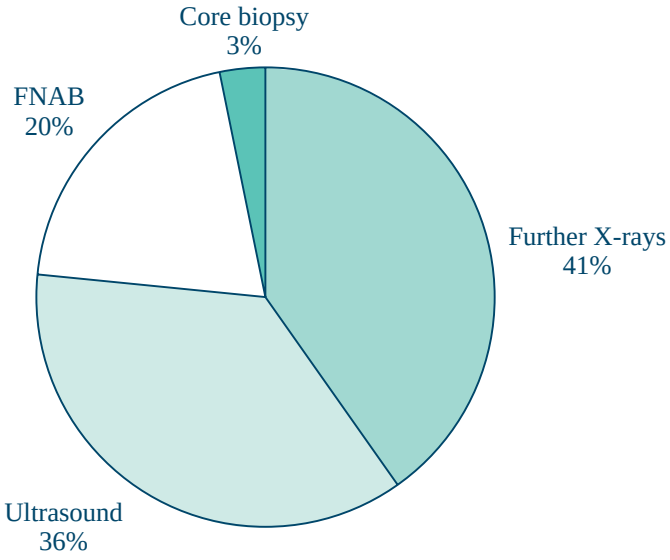


Figure 3.3 Each procedure as a proportion of the total procedures undertaken



3.4.2 FNAB and core biopsy procedures

The method used for FNAB was either palpation or guided by ultrasound or stereotaxis. The majority of the FNABs and all core biopsies were performed with a guided technique. A proportion of women had more than one lesion requiring investigation. The method used for all biopsies performed is shown in Table 3.18.

Table 3.18 Number of FNAB and core biopsy procedures by method and age

	Age Group						
Method	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
FNAB							
Palpation	20 23.8%	70 23.0%	49 23.0%	19 28.4%	4 44.4%	119 23.0%	162 23.9%
Ultrasound	35 41.7%	128 42.0%	108 50.7%	35 52.2%	2 22.2%	236 45.6%	308 45.4%
Stereotaxis	29 34.5%	107 35.1%	56 26.3%	13 19.4%	3 33.3%	163 31.5%	208 30.7%
Total FNA	**84** 100%	**305** 100%	**213** 100%	**67** 100%	**9** 100%	**518** 100%	**678** 100%
Core biopsy							
Ultrasound	6 54.5%	22 62.9%	14 36.8%	5 62.5%	0 0.0%	36 49.3%	47 51.1%
Stereotaxis	5 45.5%	13 37.1%	24 63.2%	3 37.5%	0 0.0%	37 50.7%	45 48.9%
Total Core	**11** 100%	**35** 100%	**38** 100%	**8** 100%	**0** 0.0%	**73** 100%	**92** 100%

3.4.3 Outcome of assessment

As shown in Table 3.19, of the 1,405 women attending for assessment, 266 had a malignancy detected and 140 were recommended for diagnostic open biopsy. Open biopsy is not provided in the BreastScreen SA program. Open biopsy diagnosed 52 cases of breast cancer and 12 women with atypical hyperplasia of a significant degree. Eleven women who were screened in 1997 and attended for assessment were recommended for early recall. Their final outcome is included in these tables.

Table 3.19 Outcome after assessment clinic by age

	Age Group						
Outcome of Assessment	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Malignant	25 12.0%	109 17.8%	91 19.7%	36 33.6%	5 33.3%	200 18.6%	266 18.9%
Referred for diagnostic open biopsy	20 9.6%	66 10.8%	42 9.1%	11 10.3%	1 6.7%	102 9.5%	140 10.0%
Premalignant (discharged)	0 0.0%	1 0.2%	0 0.0%	0 0.0%	0 0.0%	1 0.1%	1 0.1%
Benign - rescreen in two years	164 78.5%	437 71.3%	328 71.1%	60 56.1%	9 60.0%	765 71.2%	998 71.0%
Total assessed	**209** 100.0%	**613** 100.0%	**461** 100.0%	**107** 100.0%	**15** 100.0%	**1074** 100.0%	**1405** 100.0%

Table 3.20 includes the results of open biopsies to demonstrate the final outcome. A total of 317 (22.6%) of those women attending the assessment clinic were diagnosed with breast cancer.

Table 3.20 Final diagnosis after all diagnostic procedures

	Age Group						
Outcome of Assessment	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Malignant	32 15.3%	129 21.0%	110 23.9%	40 37.4%	6 40.0%	239 22.3%	317 22.6%
Premalignant (discharged)	3 1.4%	7 1.1%	4 0.9%	0 0.0%	0 0.0%	11 1.0%	14 1.0%
Other - Lymphoma	0 0.0%	1 0.2%	0 0.0%	0 0.0%	0 0.0%	1 0.1%	1 0.1%
- Phyllodes tumour	1 0.5%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	1 0.1%
Benign - rescreen in two years	173 82.8%	476 77.7%	347 75.3%	67 62.6%	9 60.0%	823 76.6%	1072 76.3%
Total assessed	**209** 100.0%	**613** 100.0%	**461** 100.0%	**107** 100.0%	**15** 100.0%	**1074** 100.0%	**1405** 100.0%

3.5 Breast cancer detection rate

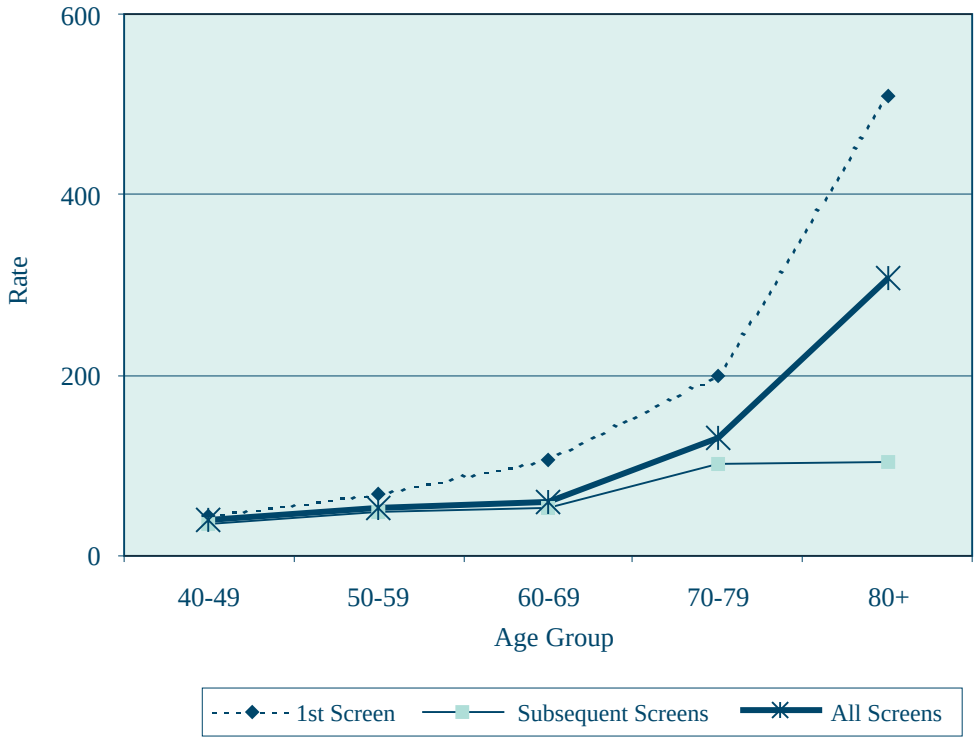
3.5.1 Breast cancer diagnosis rate

The cancer detection rate was 59 per 10,000 women screened. This corresponds to 317 cancers detected from 54,080 screens. Table 3.21 and Figure 3.4 show that the cancer detection rate increases with age. The National Accreditation Requirements state that the breast cancer detection rate for women screened in the prevalent round should be >50 per 10,000 screens and for women screened in incident rounds, >20 per 10,000 screens. The 1997 cancer detection rates were above these requirements, with rates of 81 per 10,000 for women attending for a first screen and 51 per 10,000 for women attending for a subsequent screen.

Table 3.21 Cancer detection rate per 10,000 screens by attendance and age

	Age Group						
Screens and cancer	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69 (95% CI)**	**Total (95% CI)**
First screen							
Cancers	17	41	25	18	5	66	106
Screens	3766	5907	2372	903	98	8279	13046
Rate per 10,000 screens	45.1	69.4	105.4	199.3	510.2	79.7 (60.6 - 98.9)	81.3 (65.8 - 96.7)
Subsequent screens							
Cancers	15	88	85	22	1	173	211
Screens	4337	18226	16203	2171	97	34429	41034
Rate per 10,000 screens	34.6	48.3	52.5	101.3	103.1	50.3 (42.8 - 57.7)	51.4 (44.5 - 58.3)
Total							
Cancers	**32**	**129**	**110**	**40**	**6**	**239**	**317**
Screens	8103	24133	18575	3074	195	42708	54080
Rate per 10,000 screens	**39.5**	**53.5**	**59.2**	**130.1**	**307.7**	**56.0 (48.9 - 63.0)**	**58.6 (52.2 - 65.1)**

Figure 3.4 Cancer detection rate per 10,000 screens by attendance and age



3.5.2 Method of pathological diagnosis of breast cancer

The procedure undertaken for a pathological diagnosis of breast cancer is shown in Table 3.22. The majority (74.4%) of cancers were diagnosed by FNAB.

Table 3.22 Method of pathological diagnosis technique

Method of obtaining tissue sample	Women diagnosed with cancer	Percentage
FNAB	236	74.4%
Core biopsy	29	8.8%
Diagnostic open biopsy	52	16.7%
TOTAL	**317**	**100%**

The high rate of diagnosis obtained by FNAB reflects the cytological expertise of the pathologists involved with the SA program.

3.5.3 Breast cancer by histological type

In 1997, the program diagnosed a total of 317 primary breast cancers. Table 3.23 shows that sixty-four of these (20%) were ductal carcinoma in-situ (DCIS). The National Accreditation Requirement is that 10-20% of cancers detected at the prevalent round should be DCIS. Table 3.24 shows that there was little difference in the detection rate of DCIS between first screen and subsequent screen attenders.

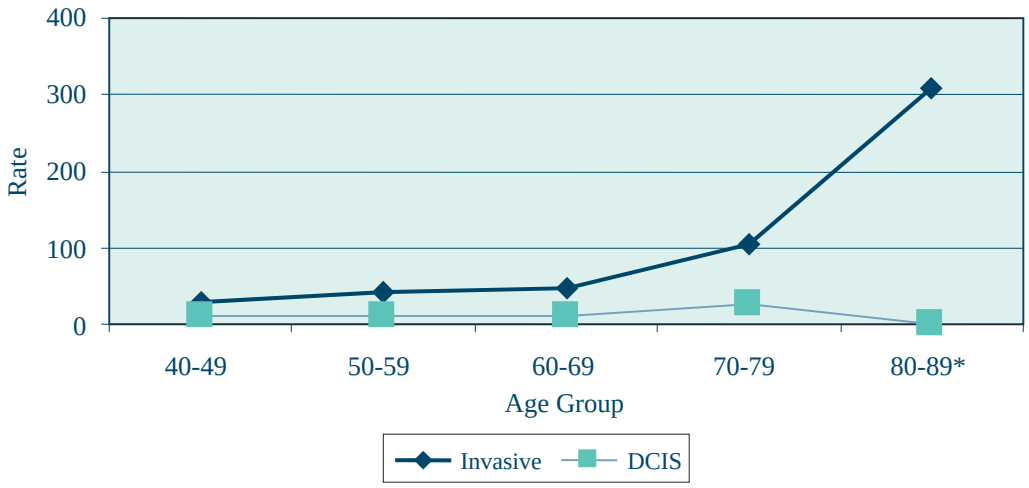
Table 3.23 Histopathology by attendance type and age

	Age Group						
Histopathology	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
First Screen							
Invasive	13 76.5%	34 82.9%	20 80.0%	12 66.7%	5 100.0%	54 81.8%	84 79.2%
DCIS	4 23.5%	7 17.1%	5 20.0%	6 33.3%	0 0.0%	12 18.2%	22 20.8%
Subtotal	**17** 100%	**41** 100%	**25** 100%	**18** 100%	**5** 100%	**66** 100%	**106** 100%
Subsequent Screens							
Invasive	11 73.3%	68 77.3%	69 81.2%	20 90.9%	1 100.0%	137 79.2%	169 80.1%
DCIS	4 26.7%	20 22.7%	16 18.8%	2 9.1%	0 0.0%	36 20.8%	42 19.9%
Subtotal	**15** 100%	**88** 100%	**85** 100%	**22** 100%	**1** 100%	**173** 100%	**211** 100%
Total Screens							
Invasive	24 75.0%	102 79.1%	89 80.9%	32 80.0%	6 100.0%	191 79.9%	253 79.8%
DCIS	8 25.0%	27 20.9%	21 19.1%	8 20.0%	0 0.0%	48 20.1%	64 20.2%
Total	**32** 100%	**129** 100%	**110** 100%	**40** 100%	**6** 100%	**239** 100%	**317** 100%

Table 3.24 Cancer detection rate per 10,000 women by histologic type, attendance and age

Histopathology	Age Group 40-49	50-59	60-69	70-79	80+	50-69 (95% CI)	Total (95% CI)
First screen							
Invasive	13	34	20	12	5	54	84
Rate /10,000 screens	34.5	57.6	84.3	132.9	510.2	65.2 (47.9 - 82.6)	64.4 (50.7 - 78.1)
DCIS	4	7	5	6	0	12	22
Rate /10,000 screens	10.6	11.9	21.1	66.4	0.0	14.5 (6.3 - 22.7)	16.9 (9.8 - 23.9)
Subsequent screens							
Invasive	11	68	69	20	1	137	169
Rate /10,000 screens	25.4	37.3	42.6	92.1	103.1	39.8 (33.1 - 46.4)	41.2 (35.0 - 47.4)
DCIS	4	20	16	2	0	36	42
Rate /10,000 screens	9.2	11.0	9.9	9.2	0.0	10.5 (7.0 - 13.9)	10.2 (7.1 - 13.3)
Total screens							
Invasive	**24**	**102**	**89**	**32**	**6**	**191**	**253**
Rate /10,000 screens	29.6	42.3	47.9	104.1	307.7	44.7 (38.4 - 51.1)	46.8 (41.0 - 52.5)
DCIS	**8**	**27**	**21**	**8**	**0**	**48**	**64**
Rate /10,000 screens	9.9	11.2	11.3	26.0	0.0	11.2 (8.1 - 14.4)	11.8 (8.9 - 14.7)

Figure 3.5 Cancer detection rate by histologic type and age



* The number of cancers is small for women aged over 80 and the interpretation of detection rates may be misleading.

Table 3.25 indicates that infiltrating ductal carcinoma of no special type forms 65% of all cancers diagnosed. The second most common type of cancer is DCIS (20%). Lobular carcinoma and its variants constituted 7% of the cancers detected.

Table 3.25 Histological type of breast cancer

Breast cancer type	Number	Percentage
Infiltrating ductal - no special type	205	64.7%
Tubular	12	3.8%
Cribiform	2	0.6%
Mucinous	6	1.9%
Lobular classical	13	4.1%
Lobular variant	8	2.5%
Mixed ductal/lobular	2	0.6%
Other	1	0.3%
Non-invasive DCIS	64	20.2%
Unknown	4	1.3%
Total	**317**	**100%**

3.5.4 Size of invasive breast cancers detected

The breast cancer detection rate by size of tumour and attendance type is presented in Table 3.26. Among first round attenders, 33.3% of women aged 50 to 69 had invasive breast cancers 10mm or less. The rate of detection of small invasive cancers (10mm or less) was 19.9 per 10,000 screens. Of the women attending for subsequent rounds, 39% of women aged 50 to 69 had small invasive cancers.

The National Accreditation Requirement is >8 per 10,000 screened women to have invasive cancers less than or equal to 10mm diameter on pathology. Eighty-eight women had cancers less than or equal to 10mm, a rate of 16.3 per 10,000 women screened.

Table 3.26 Invasive breast cancer detection rate by tumour size, attendance and age

Age Group							
Size and Detection Rate	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50 - 69 (95% CI)**	**Total (95% CI)**
First screen							
<= 10mm	1	13	5	4	3	18	26
	7.7%	38.2%	25.0%	33.3%	60.0%	33.3%	31.0%
Rate/10,000 screens	2.7	22.0	21.1	44.3	306.1	21.7 (11.7 - 31.8)	19.9 (12.3 - 27.6)
11-15mm	4	13	5	3	1	18	26
	30.8%	38.2%	25.0%	25.0%	20.0%	33.3%	31.0%
Rate/10,000 screens	10.6	22.0	21.1	33.2	102.0	21.7 (11.7 - 31.8)	19.9 (12.3 - 27.6)
>15mm	8	8	9	5	0	17	30
	61.5%	23.5%	45.0%	41.7%	0.0%	31.5%	35.7%
Rate/10,000 screens	21.2	13.5	37.9	55.4	0.0	20.5 (10.8 - 30.3)	23.0 (14.8 - 31.2)
Unknown	0	0	1	0	1	1	2
	0.0%	0.0%	5.0%	0.0%	20.0%	1.9%	2.4%
Rate/10,000 screens	0.0	0.0	4.2	0.0	102.0	1.2 (0.0 - 3.6)	1.5 (0.0 - 3.7)
Subtotal	**13**	**34**	**20**	**12**	**5**	**54**	**84**
	100%	100%	100%	100%	100%	100%	100%
Rate/10,000 screens	**34.5**	**57.6**	**84.3**	**132.9**	**510.2**	**65.2 (47.9 - 82.6)**	**64.4 (50.7 - 78.1)**
Subsequent screens							
<= 10mm	2	27	26	7	0	53	62
	18.2%	39.7%	37.7%	35.0%	0.0%	38.7%	36.7%
Rate/10,000 screens	4.6	14.8	16.0	32.2	0.0	15.4 (11.3 - 19.5)	15.1 (11.4 - 18.9)
11-15mm	7	13	23	7	0	36	50
	63.6%	19.1%	33.3%	35.0%	0.0%	26.3%	29.6%
Rate/10,000 screens	16.1	7.1	14.2	32.2	0.0	10.5 (7.0 - 13.9)	12.2 (8.8 - 15.6)
>15mm	2	27	18	5	0	45	52
	18.2%	39.7%	26.1%	25.0%	0.0%	32.8%	30.8%
Rate/10,000 screens	4.6	14.8	11.1	23.0	0.0	13.1 (9.3 - 16.9)	12.7 (9.2 - 16.1)
Unknown	0	1	2	1	1	3	5
	0.0%	1.5%	2.9%	5.0%	100.0%	2.2%	2.9%
Rate/10,000 screens	0.0	0.5	1.2	4.6	103.1	0.9 (0.0 - 1.9)	1.2 (0.2 - 2.3)
Subtotal	**11**	**68**	**69**	**20**	**1**	**137**	**169**
	100%	100%	100%	100%	100%	100%	100%
Rate/10,000 screens	**25.4**	**37.3**	**42.6**	**92.1**	**103.1**	**39.8 (33.1 - 46.4)**	**41.2 (35.0 - 47.4)**

3.6 Breast cancer characteristics and treatment

3.6.1 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 253 women with invasive cancer, 249 had histopathology results (4 had no surgery). Of these 249 women, 21 had no axillary dissection. Dissections were performed for 90% of women with invasive cancers. Table 3.27 shows that there is a strong association between tumour size and the number of women with positive nodes. Nodes were positive for 28.9% of these 228 women, but where the tumour size was greater than 15mm, 48.1% of women had positive nodes. Conversely, only 11% of the women with cancers smaller than 10mm had positive nodes. Of the 14 women with DCIS who had an axillary dissection, none had positive nodes.

Table 3.27 Nodal status and size of tumour

	Invasive size (mm)				Invasive		
Nodal status	**0-10**	**11 - 15**	**>15**	**Unknown**	**total**	**DCIS**	**Total**
No dissection	15	4	1	5	25	50	75
Dissection							
No nodes positive	65 89.0%	55 76.4%	42 51.9%	0 0.0%	162 71.1%	14 100.0%	176 72.7%
Nodes positive	8 11.0%	17 23.6%	39 48.1%	2 100.0%	66 28.9%	0 0.0%	66 27.3%
Subtotal	**73** 100.0%	**72** 100.0%	**81** 100.0%	**2** 100.0%	**228** 100.0%	**14** 100.0%	**242** 100.0%
Total number of cancers	**88**	**76**	**82**	**7**	**253**	**64**	**317**

3.6.2 Tumour grade

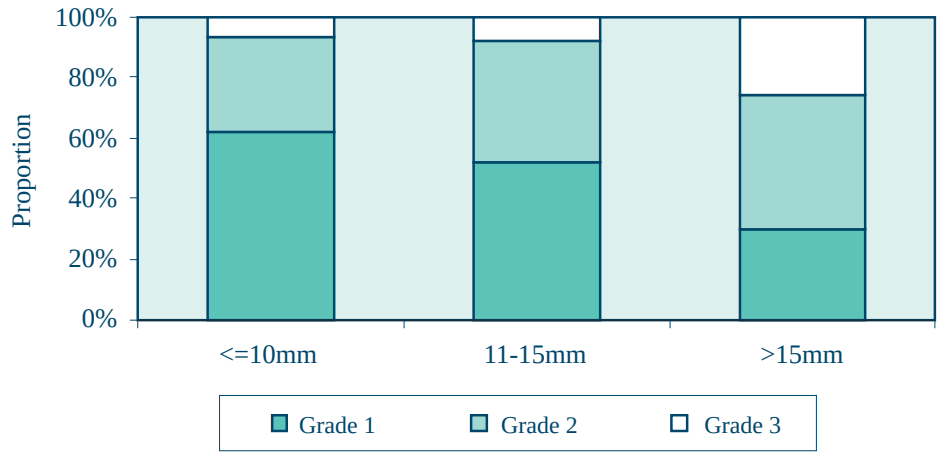
Table 3.28 shows the histological grade of screen-detected cancers in relation to tumour size for 253 cases of invasive cancer. In four cases, no surgical treatment was performed and therefore no histology was available.

Table 3.28 Histological grade of tumour by size of tumour

	Invasive Cancer Tumour Size				
Grade	**<=10mm**	**11-15mm**	**>15mm**	**Unknown size or type**	**Total**
Grade 1	46 52.3%	38 50.0%	23 28.0%	0 0.0%	107 42.3%
Grade 2	23 26.1%	29 38.2%	34 41.5%	0 0.0%	86 34.0%
Grade 3	5 5.7%	6 7.9%	20 24.4%	1 14.3%	32 12.6%
Not assessable	14 15.9%	3 3.9%	5 6.1%	2 28.6%	24 9.5%
No surgery	0 0.0%	0 0.0%	0 0.0%	4 57.1%	4 1.6%
Total	**88** 100%	**76** 100%	**82** 100%	**7** 100%	**253** 100%

Of all tumours less than or equal to 10mm, 52% were classified grade 1, and of tumours greater than 15mm, 28% were grade 1. Figure 3.6 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 3.6 Tumour grade by size



3.6.3 Treatment type

Treatment type was recorded for all women with invasive breast cancer. Of these, 27.8% had a mastectomy, 70% had a wide local excision for breast conserving surgery and 2.2% had no surgery. Patterns of treatment are similar for women living in areas classified as rural or remote compared with women living in urban areas. For women residing in a rural or remote area, 30.9% underwent a mastectomy compared to 26.4% of women in urban Adelaide. Sixty-nine percent of women with DCIS had breast-conserving surgery and 31% underwent mastectomy.

Table 3.28 Treatment of breast cancer by cancer type

Treatment	Invasive	DCIS	Total
Urban - Adelaide			
No surgery	5 2.8%	0 0.0%	5 2.3%
Complete local excision	129 72.5%	28 66.7%	157 71.4%
Mastectomy	44 24.7%	14 33.3%	58 26.4%
Subtotal	178 100.0%	42 100.0%	220 100.0%
Rural and remote			
No surgery	2 2.7%	0 0.0%	2 2.1%
Complete local excision	49 65.3%	16 72.7%	65 67.0%
Mastectomy	24 32.0%	6 27.3%	30 30.9%
Subtotal	75 100.0%	22 100.0%	97 100.0%
All areas			
No surgery	7 2.8%	0 0.0%	7 2.2%
Complete local excision	178 70.4%	44 68.8%	222 70.0%
Mastectomy	68 26.9%	20 31.3%	88 27.8%
Total	**253** 100.0%	**64** 100.0%	**317** 100.0%

3.7 Interval cancers and program sensitivity

3.7.1 Interval cancers

Interval cancers are cancers that present between screening episodes. A more detailed explanation of interval cancers is given in Section 2.3.4 of the 10 Year Report. Mammography cannot detect all breast cancers and there will be a number presenting between screening episodes. These interval cancers reduce the beneficial effect of screening on mortality. It is expected that the number of interval cancers will be higher in the second year following screening.

The National Breast Cancer Centre (NBCC) has recently undertaken a project to provide definitions and guidance for the ascertainment and reporting of interval cancers for BreastScreen Australia. The Australian Institute of Health and Welfare reports on behalf of BreastScreen Australia. It has adopted the recommendations from the NBCC report to develop performance indicators for measuring the interval cancer rate and program sensitivity on a national basis.

The interval cancer rate presented in this section for women screened during 1995 is calculated using the equation recommended by the NBCC -

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

In addition, in the table presented in this section, the following criteria apply:

- Interval breast cancers are invasive only. DCIS, lobular carcinoma in-situ (LCIS) or Paget's disease are not included, unless there is evidence of underlying invasive cancer.
- Only South Australian residents are included in the "women years at risk" population.
- Within Year 1 the "at risk" population excludes women who have previously had breast cancer.
- Within Year 2 the "at risk" population excludes all women recommended for annual rescreening. In the South Australian program, this relates to all women who have previously had breast cancer, and all women with a strong family history of breast cancer.
- Only asymptomatic women have been included.

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.

It is BreastScreen SA policy that if a woman reports a symptom, but has a normal mammogram, 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.

Of 1,554 women who reported a lump or clear or bloody discharge, four invasive cancers were detected during the first year and five during the second year. Of 3,826 women who reported other symptoms, three invasive cancers were detected during the first year and six during the second year. The following table relates to asymptomatic women who were screened during 1995 and had an interval cancer present, either during the first or second year after being cleared at their previous screening.

During the reporting period:

- For first screen women aged 50 to 59, there is a noticeable increase in the interval cancer rate during the second year (the difference is less remarkable in the other age groups).
- For all asymptomatic women screened in any round, the interval cancer rate is considerably higher for women aged between 50 and 69 during the second year.
- Overall, the interval cancer rate during the second year is much higher than during the first year. The rate is also considerably higher for subsequent screen women during the second year than for first screen women.

Table 3.29 Interval cancer rates during year 1 and year 2 of asymptomatic women screened during 1995

	Age Group						
Type of attendance	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total Av. Rate (95% C.I)**
Year 1 - Asymptomatic women							
First screen							
Number of women years at risk	3783	7012	4495	1774	128	11507	17192
Number of interval cancers	2	4	1	0	0	5	7
Rate per 10,000 women	5.3	5.7	2.2	0.0	0.0	4.3	4.1 (1.1 - 7.1)
Subsequent screen							
Number of women years at risk	3183	12078	11318	1131	35	23396	27745
Number of interval cancers	2	6	3	0	0	9	11
Rate per 10,000 women	6.3	5.0	2.7	0.0	0.0	3.8	4.0 (1.6 - 6.3)
Total screens							
Number of women years at risk	6966	19090	15813	2905	163	34903	44937
Number of interval cancers	4	10	4	0	0	14	18
Rate per 10,000 women	**5.7**	**5.2**	**2.5**	**0.0**	**0.0**	**4.0**	**4.0 (2.2 - 5.9)**
Year 2 - Asymptomatic women							
First screen							
Number of women years at risk	3581	6807	4319	1676	115	11126	16498
Number of interval cancers	2	6	1	0	0	7	9
Rate per 10,000 women	5.6	8.8	2.3	0.0	0.0	6.3	5.5 (1.9 - 9.0)
Subsequent screen							
Number of women years at risk	2740	11620	10893	1070	32	22513	26355
Number of interval cancers	3	14	12	2	0	26	31
Rate per 10,000 women	10.9	12.0	11.0	18.7	0.0	11.5	11.8 (7.6 - 15.9)
Total screens							
Number of women years at risk	6321	18427	15212	2746	147	33639	42853
Number of interval cancers	5	20	13	2	0	33	40
Rate per 10,000 women	**7.9**	**10.9**	**8.5**	**7.3**	**0.0**	**9.8**	**9.3 (6.4 - 12.2)**

3.7.2 Program sensitivity

Program sensitivity is a performance indicator to be used by the Australian Institute of Health and Welfare to measure the effectiveness of screening programs on a national basis. The concept is discussed in more detail in Section 2.3.5 of the 10 Year Report. The NBCC Report, *"The ascertainment and reporting of interval cancers within the BreastScreen Australia Program"*, recommended that this measure be calculated by screening round and age group and be considered in conjunction with the interval cancer rate. Program sensitivity is calculated as:

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

Program sensitivity only includes invasive breast cancer and not ductal carcinoma in-situ (DCIS), lobular carcinoma in situ (LCIS) or Paget's disease. Women who have had a personal history of breast cancer are excluded from Year 1 and Year 2 calculations. Women with a strong family history of breast cancer are excluded from Year 2 figures as they attend for annual screening. The following tables relate to women who were screened during 1995.

It is evident from the following table that:

- For women screened during 1995, the program sensitivity measure is highest for first screen women during the first and second years (94.2% and 92.4% respectively).
- The program sensitivity decreased during the second year for women attending for their subsequent screen (90.4% to 75.8%).
- The program sensitivity decreased for all women in Year 2 when compared with Year 1 (from 92.4% to 83.8%).

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.

Table 3.30 Program sensitivity during year 1 and year 2 of asymptomatic women screened during 1995

	Age Group						
Type of attendance	**40-49**	**50-59**	**60-69**	**70-79**	**80+**	**50-69**	**Total**
Year 1 - Asymptomatic women							
First screen							
Number of screen detected invasive cancers	11	29	39	30	5	68	114
Number of interval invasive cancers	2	4	1	0	0	5	7
Program sensitivity	84.6%	87.9%	97.5%	100.0%	100.0%	93.2%	94.2%
Subsequent screen							
Number of screen detected invasive cancers	7	44	46	7	0	90	104
Number of interval invasive cancers	2	6	3	0	0	9	11
Program sensitivity	77.8%	88.0%	93.9%	100%	N/A	90.9%	90.4%
Total screens							
Number of screen detected invasive cancers	18	73	85	37	5	158	218
Number of interval invasive cancers	4	10	4	0	0	14	18
Program sensitivity	**81.8%**	**88.0%**	**95.5%**	**100.0%**	**100.0%**	**91.9%**	**92.4%**
Year 2 - Asymptomatic women							
First screen							
Number of screen detected invasive cancers	10	29	38	28	5	67	110
Number of interval invasive cancers	2	6	1	0	0	7	9
Program sensitivity	83.3%	82.9%	97.4%	100.0%	100.0%	90.5%	92.4%
Subsequent screen							
Number of screen detected invasive cancers	6	43	41	7	0	84	97
Number of interval invasive cancers	3	14	12	2	0	26	31
Program sensitivity	66.7%	75.4%	77.4%	77.8%	N/A	76.4%	75.8%
Total screens							
Number of screen detected invasive cancers	16	72	79	35	5	151	207
Number of interval invasive cancers	5	20	13	2	0	33	40
Program sensitivity	**76.2%**	**78.3%**	**85.9%**	**94.6%**	**100.0%**	**82.1%**	**83.8%**

3.8 Further information

For further information, please contact:

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