BreastScreen WA 1999-2000

Statistical Report

Department of Health
Government of Western Australia

BreastScreen WA
Department of Health

BreastScreen AUSTRALIA
A joint Commonwealth/State and Territory Program

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Foreword

It is with pleasure that I present the BreastScreen WA 1999/2000 Statistical Report.

I would like to thank all of the staff of BreastScreen WA, working at the State Coordination Unit, the screening units and the assessment services, for their high standard of work and outstanding level of commitment to the program and the women of Western Australia.

Breast cancer continues to be the most common cancer and the most frequent cause of cancer death in Australian women. Early detection is essential for the reduction of mortality and morbidity associated with breast cancer.

In 1999-2000 BreastScreen WA consolidated the structure of the service. Following the restructure of 1997 and 1998 and the public tender process for screening services, the contract to provide screening services was granted to BreastScreen WA as it is currently structured.

This report reflects the first year of the Breast Assessment WA service, provided as one service at two sites, Royal Perth Hospital and Sir Charles Gairdner Hospital.

Prior to the establishment of the Breast Assessment Service in 1998, 57% of women with screen-detected abnormalities were assessed outside of the program. In 1999/2000 this fell to 10% of women with screen-detected abnormalities. Fewer assessments outside of the program has lead to an increase in the pre-operative diagnosis of breast cancer, and a reduction in open diagnostic biopsies and early recall rates.

Despite the difficulties of recruiting and retaining experienced staff, BreastScreen WA increased the number of women screened to 63,661 screens in 1999/2000.

Ongoing challenges that face BreastScreen WA include securing sufficient staffing and other resources that will allow the service to increase its participation rate in the target age group of 50-69 years. Encouraging Indigenous women to participate is a particular challenge facing the service. In 2001, BreastScreen WA employed an Indigenous Promotions Officer who has developed, in consultation with Indigenous consumers, breast cancer screening promotional material for Indigenous women. She has also developed a range of breast cancer screening promotional resources for Indigenous health workers and introduced an Indigenous Women's Reference Group to assist BreastScreen WA with developing culturally appropriate resources and policies.

Rapid population growth in the South Outer Metropolitan and South West areas of the state requires BreastScreen WA to increase screening capacity in the region as a priority.

I would like to acknowledge the commitment, dedication and high technical and professional standards of staff working for BreastScreen WA in all components of the service.

Dr Elizabeth Wylie
Medical Director
10th April 2003

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Introduction

The 1999/2000 Annual Statistical Report is the sixth for the BreastScreen WA program. It presents summary data for screens and assessments resulting from breast cancer screens for West Australian women who attended from 1 July 1999 to 30 June 2000.

Data is extracted from BreastScreen WA's Mammography Screening Registry, which holds all the information on screened women, from their demographics and screen-related personal details to assessment and cancer treatment information, including details about identified cancers such as pathology, size and metastatic status.

The data is presented in tables and figures, generally by age group or screening round, with results for the target age group (50-69 years) highlighted. Comparisons are made throughout the text with the results from the previous Report for the 1998/1999 screening year so that trends in performance outcomes and progress towards or beyond minimum standards can be gauged. A comparison of BreastScreen WA's performance against a selected number of National Accreditation Requirements (1994) performance standards is also presented in the Appendix. The National Accreditation Requirements describe the minimum standards and requirements developed by the National Accreditation Committee for services operating within the national program BreastScreen Australia. Although the standards were reviewed and updated in 2001, comparison with the earlier 1994 version is considered appropriate for this Report.

Where relevant, comparisons between assessments performed inside and outside the program are also included. 'Outside the program' refers to procedures where women had all of their assessment privately. In 1999 the program achieved its aim of integrating screening and assessment, and, as the proportion of non-program assessments has fallen significantly to make up less than 10% of all assessments in 1999/2000 (compared with 40% for the previous year), this will be the last time such comparison data will be presented.

General population statistics used as denominators for participation rates were drawn from the Australian Bureau of Statistics 1999 Estimated Resident Population tables. The 1996 Census data was used to derive target population figures for Indigenous women, that is women from Aboriginal or Torres Strait Islander background, and for women who speak a language other than English at home. The latter is referred to generally here as women from culturally and linguistically diverse backgrounds.

This document performs an important role in allowing BreastScreen WA and others outside the program to monitor program quality and compare performance and outcomes with previously reported information both from within Western Australia and elsewhere within the national program, BreastScreen Australia.

BreastScreen WA would like to thank all staff and sessional clinicians for their commitment and dedication to the program, particularly for the quality of the data collected and maintained in the Registry. We thank also the Public Reporting Working Group for their expert advice and guidance in the production of this Report. The Working Group comprised: Dr Vivienne Dawes, public health physician; Dr Lin Fritschi, epidemiologist; Dr Elizabeth Wylie, BSWA Medical Director; Ms Cynthia Leal, BSWA Senior Project Officer; Ms Lynley Coen, BSWA Coordinator, Recruitment and Health Promotion; Dr Eric Khong, BSWA GP Liaison Officer; Ms Jan Tresham, BSWA Coordinator, Data Management and Support Services.

BreastScreen WA Key Results for 1999/2000

ATTENDANCE

- BreastScreen WA performed 10,725 (17%) first and 52,936 (83%) subsequent screens, totalling 63,661 screens, between July 1999 and June 2000. The 50-69 year target age group made up 75% of all screens.
- Seventy one percent of the women aged 50-69 years who had a screen between July 1997 and June 1998, returned for a rescreen within the following 27 months.
- The 24-month participation rate to June 2000 for the target age group was 52%. The program screened 2,300 more women in this age group than in the 24 months to June 1999, compared with an increased population of 6000 in that age group.

DEMOGRAPHY

- Metropolitan residents made up 72% of all women, and 73% of women in the target age group, screened in 1999/2000.
- One percent of the women screened (769) were of Aboriginal or Torres Strait Islander background and 11% (7,135) were of culturally and linguistically diverse background, speaking a language other than English at home.
- The 24-month participation rate for target age women in the metropolitan area was 50%. The metropolitan participation rate for women of culturally and linguistically diverse backgrounds in the same age group was 54% while for metropolitan Indigenous women it was 17%.

RECALL TO ASSESSMENT

- The overall recall rate was 6% of all screens, or 11% for first and 5% for subsequent screens.
- For women aged 50-69 years, 95% of the screens resulted in a normal outcome while 5% were referred on for assessment procedures such as diagnostic further views, ultrasound, fine needle aspiration or core biopsy.

ASSESSMENT PROCEDURES

- On average, each woman recalled for assessment underwent 2.4 assessment procedures. Seventy six percent required only further mammographic views, clinical examination and/or ultrasound to confirm an outcome indicating no significant abnormality.
- Recommendations for diagnostic open biopsy were made for 3% of all assessments, or 0.2% of screens.
- Of those women attending for assessment, 90% had a benign outcome and 10% had a malignancy detected.
- Eighty nine percent of all cancers were diagnosed preoperatively by either fine needle aspiration (61%) or by core biopsy (29%). Diagnosis by core biopsy histology has increased by 10%, compared with 1998/1999.
- Ten percent of all cancers were diagnosed by diagnostic open biopsy, a decrease of 14% since 1998/1999.

CANCER DETECTION RATE

- A total of 356 breast cancers were screen-detected (0.6% of screens). Of these, 22% were *in situ* cancers and 78% were invasive, with 36% of the invasive cancers being less than or equal to 10mm or 67% being less than or equal to 15mm in diameter. Two non-breast cancers were detected and two cancers were detected at early review and are thus classified as interval cancers. The overall breast cancer detection rate was 56 per 10,000 women screened.
- Interval cancer rates for screens in 1998 were 4.1 and 8.8 per 10,000 for first and subsequent screens, respectively, for the 12 months following a normal mammogram.
- Women with larger cancers had more node metastases. Cancers less than 15mm had 19% of excised nodes positive, while 39% of those with cancers greater than 15mm were node positive. The greatest proportion of lower grade cancers were of smaller size.

TREATMENT

- Breast conservation surgery was used to remove 70% of malignancies detected. One third of all women with breast cancer chose to have a mastectomy, more frequently chosen by those living in country areas and those with ductal *in situ* cancers.

Summary of Outcomes of Breast Cancer Screening in 1999/2000

The table below summarises the outcomes of screening and assessment for women who attended for a screen from July 1999 to June 2000. It displays the information in two streams according to screening round - first screens or all subsequent screens.

FIRST SCREENS	SUBSEQUENT SCREENS
ATTENDANCE [a]	
Screening Mammograms **10,725** (17%)	Screening Mammograms **52,936** (83%)
SCREENING OUTCOMES [a]	
Recalled for assessment: **1,212** (11%)	Recalled for assessment: **2,524** (5%)
Routine rescreen: **9,513** (89%)	Routine rescreen: **50,412** (95%)
ASSESSMENT OUTCOMES [b]	
Recommendation after assessment:	Recommendation after assessment:
Diagnostic open biopsy 36	Diagnostic open biopsy 85
Definitive cancer treatment 60	Definitive cancer treatment 256
Early review 43	Early review 66
Other 5	Other 4
Total: **144** (12%)	Total: **411** (16%)
No malignant lesion: **1,059** (88%)	No malignant lesion: **2,112** (84%)
CANCER DETECTION [c, d]	
Breast cancers detected:	Breast cancers detected:
Invasive	Invasive
<=15mm 33	<=15mm 150
16-25mm 13	16-25mm 55
26-50mm 5	26-50mm 15
>50mm 2	>50mm 2
unknown 0	unknown 0
Sub-total: 53 (49 per 10,000 screens)	Sub-total: 222 (42 per 10,000 screens)
DCIS 15 (14 per 10,000 screens)	DCIS 64 (12 per 10,000 screens)
Total: **68** (63 per 10,000 screens)	Total: **286** (54 per 10,000 screens)
No malignant lesion[1]: **76** (90%)	No malignant lesion[1]: **125** (81%)
CANCER TREATMENT [e]	
Mastectomy **23** (34%)	Mastectomy **81** (28%)
Breast conserving surgery 44 (65%)	Breast conserving surgery **204** (71%)
No surgery **1** (1%)	No surgery **3** (1%)

INTERVAL CANCERS [f]

0-12 mths 4.1 per 10,000 screens	0-12 mths 8.8 per 10,000 screens
13-24 mths 7.0 per 10,000 screens	13-24 mths 10.6 per 10,000 screens

SOURCE: [a] *Table 12;* [b] *Table 17;* [c] *Table 24;* [d] *Table 26;* [e] *Table 30;* [f] *Table 34*

[1] *Benign outcome after diagnostic open biopsy, early review or other*

The screening program BreastScreen WA aims to reduce mortality and morbidity attributable to breast cancer by providing mammography screening for asymptomatic women and follow-up assessment to the point of diagnosis for any suspicious lesions identified at screening. Although women aged over 40 years are eligible for screening, the program actively recruits women aged 50 to 69 years, as it is this age group that has been shown to obtain the most benefit from mammography screening programs.

BreastScreen WA has been operating since 1989, for the first two years as a pilot program and from 1991 as a participant in the BreastScreen Australia program. By 1995, ten clinics were operating to provide a fully-fledged statewide screening service. BreastScreen WA achieved full accreditation with the national program in 2000. The program is free of charge for all women and part of the Population Health Division of the West Australian Department of Health. The State and Commonwealth Governments provide joint funding.

SERVICE PROVISION

BreastScreen WA is responsible for managing the statewide screening service through the State Coordination Unit (SCU) in Perth. The SCU also manages and reports on the financial aspects of the program, monitors and reports on program performance internally and to State and Commonwealth and produces, and coordinates the dissemination of, all promotional materials.

The program aims to make the screening service available and accessible to all eligible women in the state. There are six clinics in the metropolitan area and one mobile unit covering the south and eastern outer metropolitan area. Three other mobile units service the south west, south eastern and northern regions of the state within a two-year cycle. One hundred towns, from as far north as Kununurra, south to Esperance and Laverton to the east are home to the mobile clinic for periods ranging from a few days to six months.

The SCU handles appointment bookings for all screening units, coordinating them with recruitment initiatives, clinic capacities and schedules. The SCU is also responsible for film reading, record and data handling and for mailing all invitation, reminder and result letters.

A range of recruitment strategies is developed by the SCU in consultation with consumer and health professional reference groups. Specific strategies are devised for recruitment through general practitioners and community groups, and for recruiting Indigenous women, those from culturally and linguistically diverse backgrounds and for women living in rural and remote regions of the state.

BreastScreen WA also provides assessment of screen-detected abnormalities up to definitive diagnosis, including diagnostic open biopsy. The triple assessment process is utilised, involving clinical examination, imaging with special view mammography and ultrasound, and biopsy pathology. Assessment is conducted in two dedicated and accredited clinics located at Royal Perth Hospital and Sir Charles Gairdner Hospital. Breast Assessment Nurses inform women and their nominated general practitioner of the need for further assessment, organise appointments at the program assessment centres and offer support and advice to women regarding their assessment visit. Metropolitan clients are invited to attend one of the two assessment centres in Perth, whilst country clients may have their diagnostic further views done on the mobile unit. Some women chose to be assessed privately, outside the program, under the direction of their general practitioner.

QUALITY IMPROVEMENT

The service operates within the framework of a set of minimum standards and requirements for accreditation within the national program. These were reviewed in 2001 by the National Quality Management Committee of BreastScreen Australia and now comprise an expanded set of core standards and performance targets, called the National Accreditation Standards, which utilise a quality improvement approach to all aspects of screening and assessment, including aspects of service provision such as staff training, data management and consumer satisfaction.

Service and program management committees and senior staff receive reports on various aspects of the service on a regular basis. Frequent auditing of processes and outcomes of both screening and assessment forms part of the program's routine quality improvement activities. Comprehensive and confidential individual performance management for radiologists is a particularly important part of the program's activities, and is conducted quarterly by the Medical Director. Ongoing staff training, quality assurance of data held by the program and equipment and programming improvements are also part of the process of ensuring that BreastScreen WA offers the best possible standard of care and service to all women who take part in the program.

QUALITY IMPROVEMENT COMMITTEE

BreastScreen WA established a Quality Improvement Committee in early 2002 under the auspices of the Health Services (Quality Improvement) Act 1994. The Act grants special immunities and protections, including qualified privilege, for all activities and information gathered by the Committee.

The main role of the Committee is to audit clinical and administrative practices, assess new technologies and oversee compliance with National Accreditation Standards with the aim of continually improving mammography screening services to the women of Western Australia.

In 2002, the Committee focused on a review of interval cancers; audit and follow up of clients refusing to complete screening or refusing assessment of breast lesions; review of customer feedback systems; and outcomes of core biopsies and other clinical procedures. These system and policy reviews have improved clinical and administrative practices, and the outcomes of case audits have been presented at various clinical seminars and, in the case of the interval cancers audit, included as an example of the benefits of qualified privilege in the National Report on Qualified Privilege 2002, Commonwealth Department of Health and Ageing.

Participation Rates

In order to achieve the screening program's aim of reducing mortality from breast cancer, BreastScreen Australia's National Accreditation Requirements state that 70% of target age women should attend for screening in a two-year period. The screening benefit is greatest for women aged 50 to 69 years of age and it is this age group that is the focus of the program. The higher the proportion of women in this age group who are screened, the greater the health and cost benefits to the community.

The statewide participation rate was 52% (Table 1) for the 24 months to June 2000, based on 1999 estimated population figures. Compared with the 24 months to June 1999, the target age population increased by nearly 6,000 whilst the number screened in that group increased by 2,300. Consequently, the participation rate fell by nearly 1% between the two reporting periods. Participation in the program was higher in country areas than in the metropolitan region.

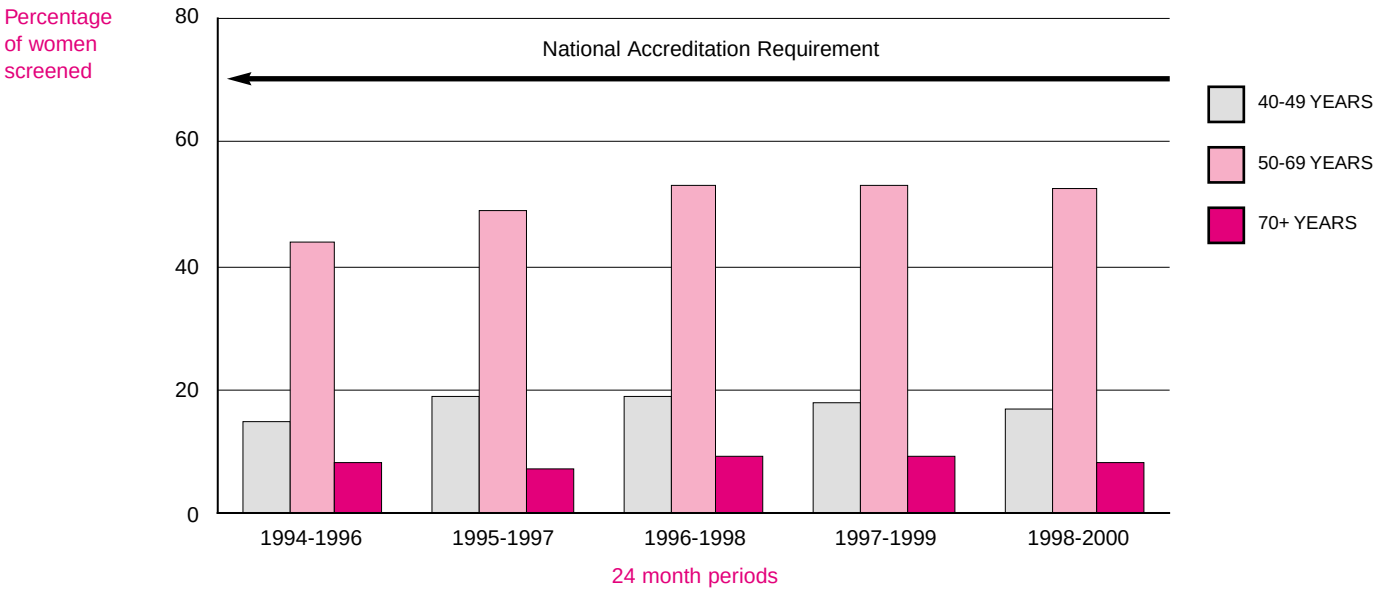
BreastScreen WA uses a number of strategies to encourage women to participate in screening. The program encourages close involvement of general practitioners; invitation and reminder letters, brochures, displays and advertising through the various media are routinely used; community women's groups and health workers are actively involved in campaigns; and special needs groups are supported through liaison with cultural organisations, translation services and disability services.

TABLE 1. PARTICIPATION RATES BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1998 TO JUNE 2000

	Age group			
Place of residence	40-49	50-69	70+	Total
METROPOLITAN				
Number of women screened	16,183	61,213	4,217	81,613
Estimated female resident population	104,492	123,148	61,100	288,740
% population screened	*15.5%*	*49.7%*	*6.9%*	*28.3%*
COUNTRY				
Number of women screened	7,196	24,088	2,076	33,360
Estimated female resident population	33,709	40,105	17,460	91,274
% population screened	*21.3%*	*60.1%*	*11.9%*	*36.5%*
TOTAL				
Number of women screened	23,379	85,301	6,293	114,973
Estimated female resident population	138,201	163,253	78,560	380,014
% population screened	*16.9%*	*52.3%*	*8.0%*	*30.3%*

Participation rates for the whole of the state have remained steady over the past three reporting periods although there has been a general increase since the program's inception in 1989. Figures for five consecutive 24-month periods through to June 2000, for the target age group (50-69 years) and the 40-49 and 70+ age groups, are illustrated below (Figure 1). The Service restructure in 1998/1999 requiring a short-term reduction in screening volume to facilitate transition to new assessment centres, together with unforseen staff shortages and equipment breakdowns in that same year, affected screening numbers over the last two reporting periods and prevented participation rates from growing as planned.

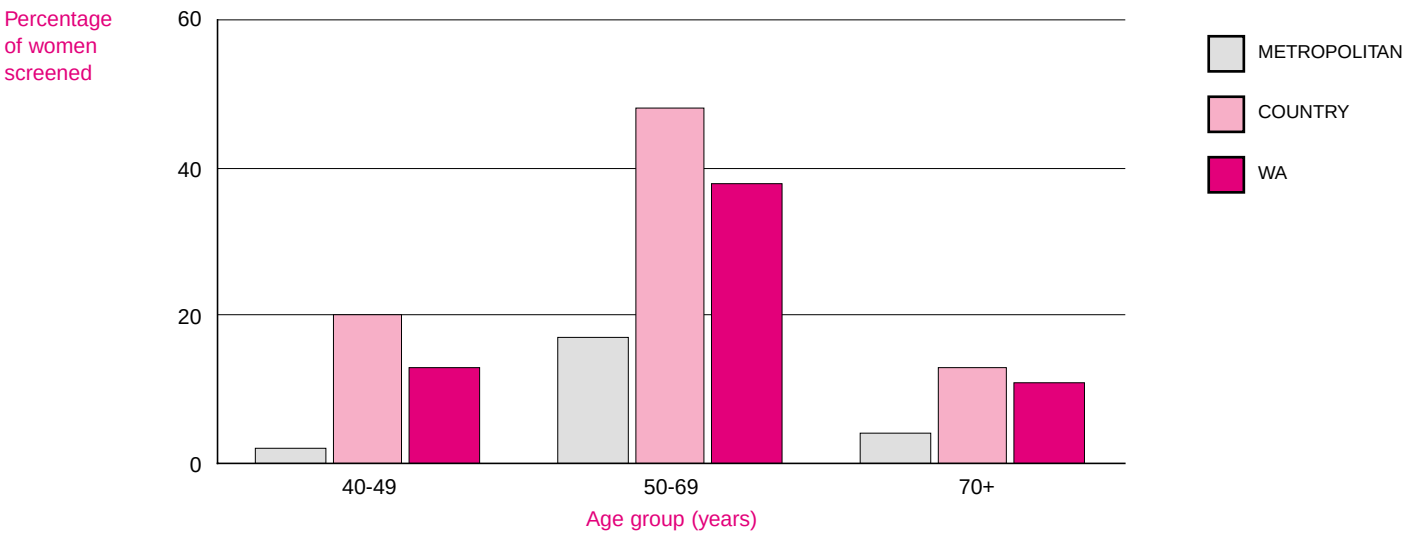
FIGURE 1. PARTICIPATION RATES BY AGE GROUP FROM 1994/1996 TO 1998/2000



For the period covered in this Report, the National Accreditation Requirements (1994) requires programs to aim for a participation rate in the 50-69 year old urban Indigenous or in culturally and linguistically diverse (CALD) women that is at least 50% of the rate for the general urban population of the same age group. From July 2002, under the revised National Accreditation Standards (NAS), programs should seek to achieve the same 70% participation rate target in these special groups as for the whole of the target age group.

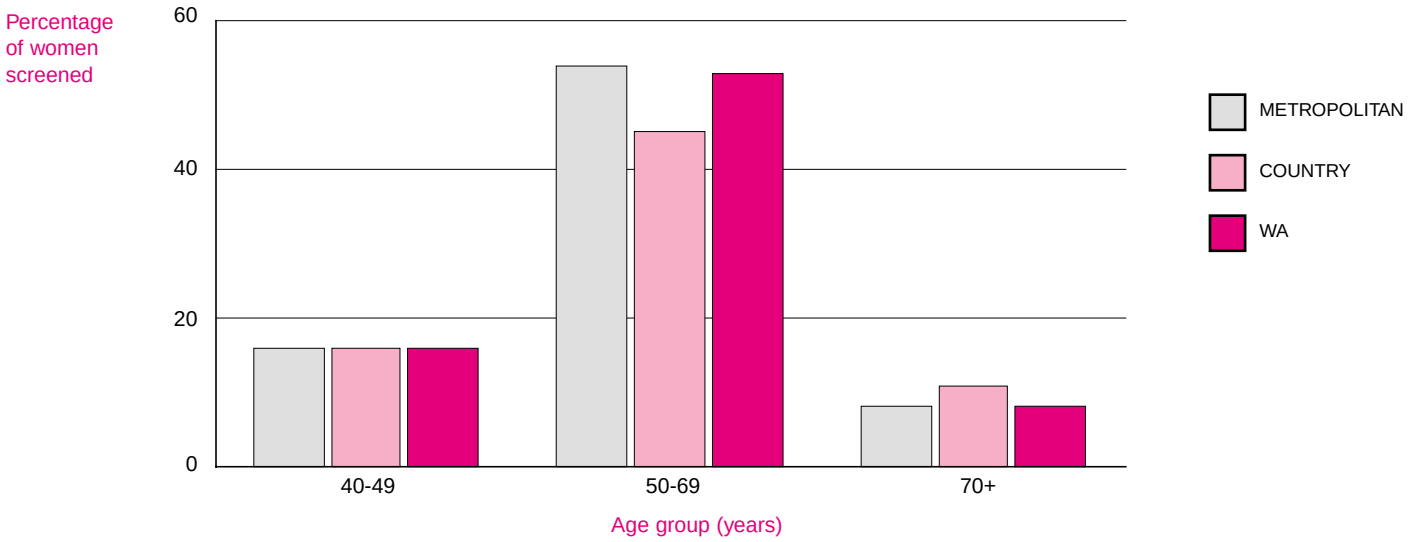
The participation rate for 50-69 year old women in the metropolitan area was 50% (Table 1). The equivalent rate for 50-69 year old Indigenous women was 17% in the same period (Figure 2), or 34% of rate for the general population. The participation rate of Indigenous women in the target age group in country Western Australia was 48%, a 6% increase on the rate for the 24-month period ending June 1999.

FIGURE 2. PARTICIPATION RATES OF INDIGENOUS WOMEN BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1998 TO JUNE 2000



The participation rate of 50-69 year old CALD women, speaking a language other than English at home and living in the metropolitan area, was 54% (Figure 3), a 4% increase compared with the previous reporting period, and higher than the rate for all metropolitan women in that age group. CALD women living in rural or remote areas increased their participation in screening by 2% compared with the 24-month period ending June 1999.

FIGURE 3. PARTICIPATION RATES OF WOMEN SPEAKING A LANGUAGE OTHER THAN ENGLISH AT HOME BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1998 TO JUNE 2000



Information that may influence a woman's risk of breast cancer, the recommended screening frequency or the accurate assessment of the mammogram is routinely collected at the time of screening. This information includes details of personal and/or family history of breast cancer, the use of hormone replacement therapy and any previous breast procedures such as mammoplasty or surgery. These characteristics of screened women and several demographic features are summarised in the following sections.

TYPE OF ATTENDANCE

BreastScreen WA does not collect or link to screening information from other screening programs elsewhere in Australia. Throughout this Report, first screens refer to the first screen with BreastScreen WA even though some of these women may have had a previous screen outside the WA program. Subsequent screens include all those following an initial screen within the program.

Table 2 shows the type of attendance, by age group, for women who were screened between 1st July 1999 and 30th June 2000. Of the 63,661 screens, 17% (10,725) were for first time attendees and the remaining 83% (52,936) were of women attending for any subsequent screen.

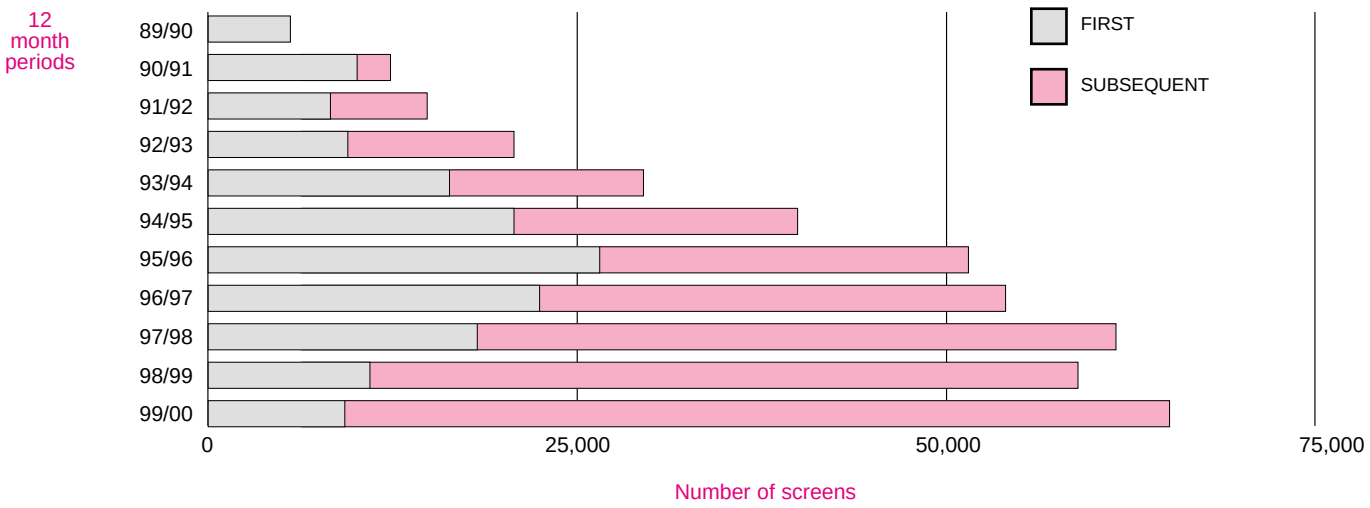
The target age group (50-69 years) made up 75% of the total screens, an increase of 1% from the previous year.

TABLE 2. NUMBER OF SCREENS BY ROUND BY AGE, JULY 1999 TO JUNE 2000

	Age group							
	<40	40-49	50-59	60-69	70-79	80+	50-69	All ages
TYPE OF ATTENDANCE								
First screens	26	5,347	3,830	1,055	414	53	4,885	10,725
% of first screens	*0.2%*	*49.9%*	*35.7%*	*9.8%*	*3.9%*	*0.5%*	*45.5%*	*100%*
Subsequent screens	12	7,131	24,488	18,393	2,772	140	42,881	52,936
% of subsequent screens	*0.0%*	*13.5%*	*46.3%*	*34.7%*	*5.2%*	*0.3%*	*81.0%*	*100%*
TOTAL	38	12,478	28,318	19,448	3,186	193	47,766	63,661
% of all screens	*0.1%*	*19.6%*	*44.5%*	*30.5%*	*5.0%*	*0.3%*	*75.0%*	*100%*

Figure 4 shows that the proportion of women attending for rescreening continues to increase annually. To June 2000 the program had screened 171,000 women at least once, with approximately 421,000 screens in total, since the start of the program. The continued growth in the proportion of subsequent attendees suggests a commitment to the program by women who have had a positive experience from its benefits.

FIGURE 4. NUMBER OF SCREENS BY ROUND BY 12-MONTH PERIOD BETWEEN 1989/1990 AND 1999/2000



AREA OF RESIDENCE

According to 1999 Estimated Resident Population figures, 75% of Western Australian women aged 50-69 years live in the Perth metropolitan area.[2,3] The pattern of screening by area of residence should mirror these demographics as clinics are situated around the State according to population numbers and women are generally assigned to particular clinic catchment areas. Table 3 and Figure 5 below show the number and proportions of women screened in 1999/2000 according to their place of residence at the time of screening.

Seventy two percent of all screens, and 73% of screens in women aged 50-69 years, were in women resident in the metropolitan area. These proportions are higher than in 1998/1999 and reflect an increase in the absolute number of screens in the metropolitan area rather than country areas over this period. The annual number of screens in country areas is partly dependent on mobile clinic schedules and on changing populations in rural and remote centres in response to economic factors.

Whilst only women aged 40 years or over are screened by the program, it is BreastScreen WA policy that, in remote areas, women aged 35-39 years with a strong family or personal history of breast cancer can be accepted for screening providing they have a doctor's referral. The four metropolitan women aged 35-39 years screened in 1999/2000 were in fact temporarily resident in remote areas at the time of their screen and conformed to the program's policy.

TABLE 3. NUMBER OF WOMEN SCREENED BY PLACE OF RESIDENCE, JULY 1999 TO JUNE 2000

	Age group									
	<40		40-49		50-69		70+		All ages	
Place of residence	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
METROPOLITAN	4	*10.5%*	8,628	*69.1%*	34,835	*72.9%*	2,346	*69.4%*	45,813	*72.0%*
COUNTRY	34	*89.5%*	3,840	*30.8%*	12,912	*27.0%*	1,033	*30.6%*	17,819	*28.0%*
Interstate/Unknown	0	*0.0%*	10	*0.1%*	19	*0.0%*	0	*0.0%*	29	*0.0%*
TOTAL	38	*100%*	12,478	*100%*	47,766	*100%*	3,379	*100%*	63,661	*100%*

FIGURE 5. PERCENTAGE OF WOMEN SCREENED BY PLACE OF RESIDENCE, JULY 1999 TO JUNE 2000

[2] *Metropolitan and rural/remote (i.e. country) classifications are according to the "Rural, Remote and Metropolitan Areas Classification" of the Commonwealth Departments of Health and Family Services and Primary Industries and Energy, January 1994 and based on concordance with statistical local areas.*

[3] *Australian Bureau of Statistics, Estimated Residential Population, June 1999 (based on the 1996 Census).*

INDIGENOUS WOMEN

In the 1996 Census, 1% of all Western Australian women over the age of 40 years identified themselves as being of Aboriginal or Torres Strait Islander (ATSI) descent, with 41% in the screening program target age group of 50-69 years and 74% living in rural and remote areas.[4]

In 1999/2000, approximately 1% of all BreastScreen WA screens were performed for Indigenous women (769) with 66% of these women in the target age group (Table 4). These proportions are similar to those of Indigenous women in the total state population.

TABLE 4. NUMBER OF INDIGENOUS WOMEN SCREENED BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group					
	<40	40-49	50-69	70+	All ages	% of all women
ABORIGINAL OR TORRES STRAIT ISLANDER (ATSI) WOMEN						
Number of women screened	2	225	509	33	769	*1.2%*
% of women screened	*0.3%*	*29.3%*	*66.2%*	*4.3%*	*100%*	
NON- ABORIGINAL OR TORRES STRAIT ISLANDER (ATSI) WOMEN						
Number of women screened	36	12,253	47,257	3,346	62,892	*98.8%*
% of women screened	*0.1%*	*19.5%*	*75.1%*	*5.3%*	*100%*	
ALL WOMEN						
Number of women screened	38	12,478	47,766	3,379	63,661	*100%*
% of women screened	*0.1%*	*19.6%*	*75.0%*	*5.3%*	*100%*	

WOMEN FROM CULTURALLY AND LINGUISTICALLY DIVERSE BACKGROUNDS

An estimated 12% of West Australian women over the age of 40 years speak a language other than English at home.[3] In the 12 months to June 2000 the program screened 7,135 women in this group, or 11% of all women screened (Table 5). Seventy seven percent of these women were in the 50-69 year age group.

A total of seventy seven different languages were recorded with the most common, other than English, spoken at home being Italian, Chinese languages and Dutch. Over 95 different countries of birth were represented in the numbers screened. For those women not born in Australia, the majority came from the United Kingdom, Italy, New Zealand and the Netherlands. Both the proportions of women screened and the demographics mirror their representation in the total population.

TABLE 5. NUMBER OF WOMEN SCREENED BY LANGUAGE SPOKEN AT HOME BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group					
	<40	40-49	50-69	70+	All ages	% of all women
WOMEN SPEAKING LANGUAGE OTHER THAN ENGLISH AT HOME						
Number of women screened	1	1,322	5,492	320	7,135	*11.2%*
% of women screened	*0.0%*	*18.5%*	*77.0%*	*4.5%*	*100%*	
WOMEN SPEAKING ENGLISH AT HOME						
Number of women screened	37	11,156	42,274	3,059	56,526	*88.8%*
% of women screened	*0.1%*	*19.7%*	*74.8%*	*5.4%*	*100%*	
ALL WOMEN						
Number of women screened	38	12,478	47,766	3,379	63,661	*100%*
% of women screened	*0.1%*	*19.6%*	*75.0%*	*5.3%*	*100%*	

[4] *Australian Bureau of Statistics, Census of Population and Housing 1996.*

PERSONAL HISTORY OF BREAST CANCER

One percent of all women screened declared a personal history of breast cancer, this may have been detected outside the BreastScreen WA program or been diagnosed at a previous screen within the program (Table 6). These women are routinely invited for annual rescreening, except if they have had a bilateral mastectomy. The proportion with personal history remains the same as in 1998/1999.

TABLE 6. NUMBER OF SCREENS WHERE WOMEN REPORTED PERSONAL HISTORY OF BREAST CANCER BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group															
	<40		40-49		50-59		60-69		70-79		80+		50-69		All ages	
	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
Personal history	0	*0.0%*	45	*0.4%*	308	*1.1%*	361	*1.9%*	135	*4.2%*	17	*8.8%*	669	*1.4%*	866	*1.4%*
No personal history	38	*100%*	12,433	*99.6%*	28,010	*98.9%*	19,087	*98.1%*	3,051	*95.8%*	176	*91.2%*	47,097	*98.6%*	62,795	*98.6%*
ALL WOMEN SCREENED	38	*100%*	12,478	*100%*	28,318	*100%*	19,448	*100%*	3,186	*100%*	193	*100%*	47,766	*100%*	63,661	*100%*

FAMILY HISTORY OF BREAST CANCER

In 1999/2000, BreastScreen WA routinely invited all women with a family history of breast cancer in any first degree relative of either sex for annual rescreening. Table 7 shows that in 1999/2000, 16% (9,844) of women reported some family history of breast cancer, an increase of 1% from the previous year.

In remote areas, women aged 35-39 years with a strong family history of breast cancer can be accepted in the program provided they have a doctor's referral. This is reflected in the table below where a high percentage of women (87%) screened under 40 years of age reported a family history of breast cancer.

TABLE 7. NUMBER OF SCREENS WHERE WOMEN REPORTED A FAMILY HISTORY OF BREAST CANCER BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group															
	<40		40-49		50-59		60-69		70-79		80+		50-69		All ages	
	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
Family history	33	*86.8%*	2,082	*16.7%*	3,921	*13.8%*	3,145	*16.2%*	624	*19.6%*	39	*20.2%*	7,066	*14.8%*	9,844	*15.5%*
No family history	5	*13.2%*	10,396	*83.3%*	24,397	*86.2%*	16,303	*83.8%*	2,562	*80.4%*	154	*79.8%*	40,700	*85.2%*	53,817	*84.5%*
ALL WOMEN SCREENED	38	*100%*	12,478	*100%*	28,318	*100%*	19,448	*100%*	3,186	*100%*	193	*100%*	47,766	*100%*	63,661	*100%*

WOMEN REPORTING SYMPTOMS AT SCREEN

Screens where women reported having symptoms at the time of screening are shown in Table 8. The category 'Nipple discharge' includes blood stained, clear or non-specific discharge. The 'Pain/other' category includes new, prolonged and/or severe pain and any other symptoms reported.

Because the screening program is aimed at asymptomatic women, those who indicate that they have a symptom at the time of booking are encouraged to visit their general practitioner for a clinical examination, as are those who present at screening with a symptom. Details of the symptom are included in the result letter sent to the woman's general practitioner. Symptomatic women with an abnormal mammogram have a clinical examination at the time of assessment.

From late-2001 onwards, only breast lumps and nipple discharge were classified as significant symptoms and pain was excluded as a symptom significant enough to strongly recommend investigation. Women with significant symptoms and a normal screen are now followed up in the program to encourage investigation of the symptom and data is collected on these assessments. They are offered an appointment at a program breast assessment centre to have the symptom investigated.

A total of 709 (0.6%) women screened in 1999/2000 reported symptoms at the time of screening, and only half of these were considered significant symptoms - breast lump and/or nipple discharge. The under-50 age groups reported the highest proportions of symptoms.

TABLE 8. NUMBER OF SCREENS WHERE WOMEN REPORTED SYMPTOMS BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group																	
	<40		40-49		50-59		60-69		70-79		80+		50-69		All ages	
	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
SYMPTOMS REPORTED																
Breast lump	2		95		117		36		10		2		153		262	
Nipple discharge	0		40		26		13		6		0		39		85	
Breast lump + nipple discharge	0		3		0		1		0		0		1		4	
Sub-total	2	*5.3%*	138	*1.1%*	143	*0.5%*	50	*0.3%*	16	*0.5%*	2	*1.0%*	193	*0.4%*	351	*0.6%*
Pain / other	0	*0.0%*	109	*0.9%*	133	*0.5%*	90	*0.5%*	22	*0.7%*	4	*2.1%*	223	*0.5%*	358	*0.6%*
TOTAL SYMPTOMS	2		*247*		276		140		38		6		416		709	
NO SYMPTOMS REPORTED	36	*94.7%*	12,231	*98.0%*	28,042	*99.0%*	19,308	*99.3%*	3,148	*98.8%*	187	*96.9%*	47,350	*99.1%*	62,952	*98.9%*
ALL WOMEN SCREENED	38	*100%*	12,478	*100%*	28,318	*100%*	19,448	*100%*	3,186	*100%*	193	*100%*	47,766	*100%*	63,661	*100%*

HORMONE REPLACEMENT THERAPY STATUS

Women are asked at the time of screening whether they are currently having, or have had, hormone replacement therapy (HRT). The use of HRT is known to be associated with increased breast tissue density and may make breast cancer detection more difficult.

Thirty seven percent of women aged 50-69 years reported using HRT at the time of screening, a two percent increase compared with 1998/1999 (35%). Across all ages the current or past use of HRT also increased by 2% compared with the previous year. Women in the 50-59 year age group reported the highest recent usage of HRT.

TABLE 9. NUMBER OF SCREENS WHERE WOMEN REPORTED USING HRT BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group															
	<40		40-49		50-59		60-69		70-79		80+		50-69		All ages	
	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
HRT reported	0	*0.0%*	1,992	*16.0%*	11,259	*39.8%*	6,528	*33.6%*	713	*22.4%*	24	*12.4%*	17,787	*37.2%*	20,516	*32.2%*
No HRT reported	38	*100%*	10,486	*84.0%*	17,059	*60.2%*	12,920	*66.4%*	2,473	*77.6%*	169	*87.6%*	29,979	*62.8%*	43,145	*67.8%*
ALL WOMEN SCREENED	38	*100%*	12,478	*100%*	28,318	*100%*	19,448	*100%*	3,186	*100%*	193	*100%*	47,766	*100%*	63,661	*100%*

WOMEN WITH BREAST IMPLANTS

Breast implants make it more difficult to detect early cancer on a mammogram so special compression techniques must be used and more x-rays are taken.

At the time of booking an appointment women are asked if they have breast implants. If so, they are sent a pamphlet containing information about mammography and breast implants prior to their screening. They are also required to sign a special consent form in addition to the normal consent for screening to indicate that they understand the difficulties in screening and detecting abnormalities in breasts with implants. In addition, the result letter to the women and to their nominated general practitioner contains advice about regular clinical breast examination.

Less than one percent of screened women have breast implants. Table 10 shows that there were 478 (0.8%) screens in women with breast implants, a slight (0.1%) increase from the previous year.

TABLE 10. NUMBER OF SCREENS WHERE WOMEN HAD BREAST IMPLANTS BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group															
	<40		40-49		50-59		60-69		70-79		80+		50-69		All ages	
	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
Breast implants	0	*0.0%*	112	*0.9%*	295	*1.0%*	70	*0.4%*	1	*0.0%*	0	*0.0%*	365	*0.8%*	478	*0.8%*
No breast implants	38	*100%*	12,366	*99.1%*	28,023	*99.0%*	19,378	*99.6%*	3,185	*100.0%*	193	*100%*	47,401	*99.2%*	63,183	*99.2%*
ALL WOMEN SCREENED	38	*100%*	12,478	*100%*	28,318	*100%*	19,448	*100%*	3,186	*100%*	193	*100%*	47,766	*100%*	63,661	*100%*

The rescreen rate is expressed as the percentage of women attending in 1997/1998 who were recommended for re-screening and returned for a rescreen within 27 months. It includes women who have either a yearly or 2-yearly rescreen recommendation. More than 75% of women aged 50-69 years should be rescreened within the recommended interval, according to BreastScreen Australia's National Accreditation Requirements.

The normal recommended interval is two years; those with a family history or personal history of breast cancer and those who have had a previous diagnosis of high-risk breast changes such as atypical hyperplasias are recommended for annual screening. Women aged 70 years and over are not re-invited when they are due but are welcome to attend for a screen.

Table 11 shows that 71% of women in the target age group returned to the program for a routine rescreen. The age at the time of the index year screen (that is, in 1997/1998) is shown. Women of all ages who had been previously screened (72%) were more likely to return for a rescreen within 27 months than first attendees (57%).

TABLE 11. NUMBER OF WOMEN WHO RETURNED FOR ROUTINE RESCREEN WITHIN 27 MONTHS OF THEIR 1997/1998 SCREENING

	Age group			
Type of screening	40-49	50-69	70+	Total
FIRST SCREENS				
Number of women screened in 1997/98	6,691	9,178	1,358	17,227
Number of women attending rescreening	4,145	5,527	166	9,838
% of women rescreened	*61.9%*	*60.2%*	*12.2%*	*57.1%*
SUBSEQUENT SCREENS				
Number of women screened in 1997/98	6,447	35,331	2,493	44,271
Number of women attending rescreening	4,917	25,955	889	31,761
% of women rescreened	*76.3%*	*73.5%*	*35.7%*	*71.7%*
TOTAL				
Number of women screened in 1997/98	13,138	44,509	3,851	61,498
Number of women attending rescreening	9,062	31,482	1,055	41,599
% of women rescreened	*69.0%*	*70.7%*	*27.4%*	*67.6%*

Of the 63,661 screens, 94% showed no mammographic abnormality and the women were returned to routine rescreen. The remaining 6% were referred on for assessment such as diagnostic further views, ultrasound, fine needle aspiration or core biopsy. The under-50 year age groups had the highest recall rates (each 8%) whilst those in the target age group had a recall rate of 5%. Table 12 shows the outcomes of screening by round, for each age group. More first screens were recalled than subsequent screens - 11% vs. 5% - and this difference was reflected across all age groups. The higher rate for first screens is most likely because there are no previous films available to the radiologist reader with which to compare areas of change.

The National Accreditation Requirements state that in the process of achieving a high cancer detection rate, the service must also minimise negative effects such as unnecessary anxiety to the woman and unnecessary biopsy. It is therefore not appropriate for services to recall a large proportion of women to assessment. Accordingly, the performance standard for recall rates is set at no more than 10% of first screens and 5% of subsequent screens. In 1999/2000, BreastScreen WA first screen assessment referrals exceeded this minimum.

TABLE 12. OUTCOMES OF SCREENING BY ROUND BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group								
	<40	40-49	50-59	60-69	70+	50-69		All ages	
Outcomes of screening	No. screens	No. screens	No. screens	No. screens	No. screens	No. screens	%	No. screens	%
FIRST SCREENS									
Routine rescreening	24	4,721	3,406	938	424	4,344	*88.9%*	9,513	*88.7%*
Referred for assessment	2	626	424	117	43	541	*11.1%*	1,212	*11.3%*
Sub-total	26	5,347	3,830	1,055	467	4,885	*100%*	10,725	*100%*
SUBSEQUENT SCREENS									
Routine rescreening	11	6,745	23,252	17,615	2,789	40,867	*95.3%*	50,412	*95.2%*
Referred for assessment	1	386	1,237	777	123	2,014	*4.7%*	2,524	*4.8%*
Sub-total	12	7,131	24,489	18,392	2,912	42,881	*100%*	52,936	*100%*
ALL SCREENS									
Routine rescreening	35	11,466	26,658	18,553	3,213	45,211	*94.7%*	59,925	*94.1%*
Referred for assessment	3	1,012	1,661	894	166	2,555	*5.3%*	3,736	*5.9%*
TOTAL	38	12,478	28,319	19,447	3,379	47,766	*100%*	63,661	*100%*

ASSESSMENT PROCEDURES

There were 3,736 (6% of screens) women recalled for assessment following a suspicious mammogram. The number of assessment procedures, by screening round, performed on all women who attended assessment is shown below in Table 13. All assessment outcomes were followed up, including those for women who were assessed privately, to ensure a satisfactory outcome was achieved. Details of one woman who underwent assessment despite a normal mammogram are also included for completeness.[5]

An individual woman may be counted more than once if she had more than one procedure performed. Women who had more than one lesion to be assessed may have had different procedures undertaken for each lesion. The average number of procedures performed per woman was 2.4, compared with 2.3 in 1998/1999. Most women who required assessment other than further views had at least two other procedures, such as a clinical examination and ultrasound.

For women screened in the country, diagnostic further views were done at the mobile screening clinic whilst any other procedures were undertaken at a program assessment centre or privately, in consultation with the woman's general practitioner. For women who declined to have further views within the program but who had appropriate assessment work-up elsewhere, the diagnostic views were counted under 'Other mammography' as the full details of these films, such as the number and type of views, could not be determined. Other mammography also includes x-rays taken after an excisional or needle biopsy, or x-rays taken at an early review visit. Other mammography fell by 2% compared with 1998/1999 data and probably reflects the greater number of women being assessed within the program; this change in assessment location can be seen more clearly in Table 14 where procedures are split by program-funded or not funded.

The most common assessment procedure was diagnostic further mammographic views, performed on 3,267 women (88% of all women assessed) and making up 36% of all assessment procedures, followed by clinical examination (19%) and ultrasound (19%). Compared with 1998/1999 the use of further views, ultrasound and clinical examination as a percentage of all procedures was unchanged while core biopsies increased by 1% and the proportion of open biopsies fell by about half.

TABLE 13. ASSESSMENT PROCEDURES PERFORMED BY ROUND, JULY 1999 TO JUNE 2000

	First screens		Subsequent screens		All screens	
Procedure	No. procedures	%	No. procedures	%	No. procedures	%
Diagnostic Further Views	1,046	*34.5%*	2,221	*36.9%*	3,267	*36.1%*
Clinical examination	611	*20.2%*	1,123	*18.6%*	1,734	*19.2%*
Ultrasound	617	*20.3%*	1,141	*18.9%*	1,758	*19.4%*
Fine needle aspiration	387	*12.8%*	798	*13.3%*	1,185	*13.1%*
Core biopsy	234	*7.7%*	469	*7.8%*	703	*7.8%*
Other mammography	101	*3.3%*	178	*3.0%*	279	*3.1%*
Diagnostic open biopsy	36	*1.2%*	92	*1.5%*	128	*1.4%*
TOTAL PROCEDURES	3,032	*100%*	6,022	*100%*	9,054	*100%*
Total women attending for assessment	1,203		2,523		3,726	
Average number of investigations per woman	2.5		2.4		2.4	

[5] *This and subsequent tables include details from one woman who was not referred for assessment for a mammographic abnormality but underwent some procedures to investigate a symptom. In addition, there were eleven women who declined assessment.*

Table 14 compares the number of procedures where the assessment was within the BreastScreen WA program with the number of investigations outside the program. Since the program was restructured in 1998/1999 and dedicated assessment centres were set up for screened women, the majority are now choosing to attend the program-funded assessment clinics. 'Assessment outside program' only counts women who had none of their assessment visits funded by the program.

Further mammographic views have been excluded from the Table, as they were all in any case program-funded. The number of procedures classed as 'Other mammography', although small, has also been excluded because it counts a mix of diagnostic further views performed outside the program plus other mammography and is difficult to apportion between funded and non-funded.

Ninety percent of procedures, excluding diagnostic further views/further mammography, were carried out at BreastScreen WA assessment centres in 1999/2000, a significant increase from the previous year where only 60% of assessment procedures were performed within the program. In 1997/1998 only 43% of procedures were program funded.

The program aims to reduce unnecessary anxiety in women by encouraging pre-operative diagnosis. Non-surgical biopsy rates were higher in program assessment centres compared with outside the program: fine needle and core biopsies made up 36% of the procedures at assessment centres and 19% of private assessments. Conversely, diagnostic open biopsies made up 9% of non-funded procedures and only 1% of procedures within the program.

TABLE 14. ASSESSMENT PROCEDURES, EXCLUDING DIAGNOSTIC FURTHER VIEWS, BY FUNDING, JULY 1999 TO JUNE 2000

Procedure	Assessment within Program		Assessment outside Program		All assessments
CLINICAL EXAMINATION	1,526	*31%*	208	*36%*	1,734
% of clinical examinations	*88.0%*		*12.0%*		*100%*
ULTRASOUND	1,557	*32%*	201	*35%*	1,758
% of ultrasounds	*88.6%*		*11.4%*		*100%*
FINE NEEDLE ASPIRATION	1,097	*22%*	88	*15%*	1,185
% of fine needle aspirations	*92.6%*		*7.4%*		*100%*
CORE BIOPSY	683	*14%*	20	*4%*	703
% of core biopsies	*97.2%*		*2.8%*		*100%*
DIAGNOSTIC OPEN BIOPSY	74	*1%*	54	*9%*	128
% of diagnostic open biopsies	*57.8%*		*42.2%*		*100%*
TOTAL PROCEDURES	4,937	*100%*	571	*100%*	5,508
% all procedures	*89.6%*		*10.4%*		*100%*

THE DEFINITIVE DIAGNOSTIC PROCEDURE

Table 15 shows the combinations of the various assessment procedures required to reach a diagnosis and the number of women who underwent these procedures. Three women who only had 'Other mammography' (OM) have been included as part of the 'further views' category.

Thirty nine percent (1,458) of all women assessed required only diagnostic further views to reach a definitive decision; this is 15% less than the proportion in 1998/1999. Other non-invasive procedures (clinical examination and ultrasound) added a further 27% to pre-biopsy diagnoses. Clinical examinations as the definitive procedure increased by 5% compared with 1998/1999 and reflects a change in policy to clinically examine all women with normal diagnostic further views where dense breasts or asymmetric parenchyma were noted. Similarly, with most women now attending the program assessment centres for diagnostic further views, the decrease in further views and the increase in ultrasounds as the definitive procedures reflect the opportunity to take advantage of ultrasound facilities within the one assessment visit.

Fine needle cytology (15%) and/or core biopsy histology (15%) were required in 30% of cases to confirm diagnosis, an increase of 5% of the rates in 1998/1999. Conversely, diagnostic open biopsy returned the definitive diagnosis in 3% of cases, a fall of 3% compared with the previous year.

TABLE 15. ASSESSMENT PROCEDURES GIVING A DEFINITIVE DIAGNOSIS BY ROUND BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group													
	<40		40-49		50-59		60-69		70-79		80+		50-69		All ages	
Procedure	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
FURTHER VIEWS ONLY (FV)																
First screens	2		245		130		41		9		0		171		427	
Subsequent screens	0		168		504		311		46		2		815		1,031	
Sub-total	2	*66.7%*	413	*41.0%*	634	*38.2%*	352	*39.5%*	55	*35.3%*	2	*18.2%*	986	*38.7%*	1,458	*39.1%*
CLINICAL EXAMINATION (CE)																
+/- FV																
First screens	0		54		27		7		1		0		34		89	
Subsequent screens	0		23		89		34		6		0		123		152	
Sub-total	0	*0.0%*	77	*7.6%*	116	*7.0%*	41	*4.6%*	7	*4.5%*	0	*0.0%*	157	*6.2%*	241	*6.5%*
ULTRASOUND (US)																
+/- FV, CE																
First screens	0		133		106		27		8		0		133		274	
Subsequent screens	0		80		231		144		12		3		375		470	
Sub-total	0	*0.0%*	213	*21.1%*	337	*20.3%*	171	*19.2%*	20	*12.8%*	3	*27.3%*	508	*19.9%*	744	*20.0%*
FINE NEEDLE ASPIRATION (FNA)																
+/- FV, CE, US, OM																
First screens	0		93		63		18		7		3		81		184	
Subsequent screens	1		51		198		118		22		1		316		391	
Sub-total	1	*33.3%*	144	*14.3%*	261	*15.7%*	136	*15.2%*	29	*18.6%*	4	*36.4%*	397	*15.6%*	575	*15.4%*
CORE BIOPSY (CB)																
+/- FV, CE, US, OM, FNA																
First screens	0		82		84		16		11		0		100		193	
Subsequent screens	0		50		176		138		23		0		314		387	
Sub-total	0	*0.0%*	132	*13.1%*	260	*15.7%*	154	*17.3%*	34	*21.8%*	2	*18.2%*	414	*16.2%*	580	*15.6%*
DIAGNOSTIC OPEN BIOSY (DOB)																
+/- any of the above procedures																
First screens	0		15		11		7		3		0		18		37	
Subsequent screens	0		14		39		31		8		0		70		91	
Sub-total	0	*0.0%*	29	*2.9%*	50	*3.0%*	38	*4.3%*	11	*7.1%*	0	*0.0%*	88	*3.5%*	128	*3.4%*
TOTAL																
First screens	2		622		421		116		39		3		537		1,203	
Subsequent screens	1		386		1,237		776		117		6		2,013		2,523	
ALL SCREENS	3	*100%*	1,008	*100%*	1,658	*100%*	892	*100%*	156	*100%*	11	*100%*	2,550	*100%*	3,726	*100%*

Table 16 compares definitive diagnosis procedures where the assessment was within the BreastScreen WA program with definitive diagnosis procedures outside the program. As in Table 14, further mammographic views have been excluded, as they were program-funded.

Core biopsies were performed three times more frequently in program assessments. In 1998/1999 the rate difference was similar and, as noted in the report for that year, the higher rate of core biopsies inside the program may be due to the lack of access to appropriate machines in rural areas, requiring women to come to Perth for stereotactic core biopsies. The higher diagnostic accuracy of core biopsy in the pre-operative assessment of lesions may account for the lower diagnostic open biopsy rate inside the program, and the differential between the rate of open biopsies in assessment centres and in non-funded assessments has increased from 4% to 19% over the two reporting periods.

TABLE 16. ASSESSMENT PROCEDURES YIELDING A DEFINITIVE DIAGNOSIS BY FUNDING, JULY 1999 TO JUNE 2000

	Assessments within Program		Assessments outside Program		All assessments	
Procedure	No. screens	%	No. screens	%	No. screens	%
CLINICAL EXAMINATION (CE)						
+/- FV						
First screens	84		5		89	
Subsequent screens	144		8		152	
Sub-total	228	*11.2%*	13	*5.5%*	241	*10.6%*
ULTRASOUND (US)						
+/- FV, CE						
First screens	244		30		274	
Subsequent screens	410		60		470	
Sub-total	654	*32.2%*	90	*38.3%*	744	*32.8%*
FINE NEEDLE ASPIRATION (FNA)						
+/- FV, CE, US, OM						
First screens	164		20		184	
Subsequent screens	351		40		391	
Sub-total	515	*25.3%*	60	*25.5%*	575	*25.4%*
CORE BIOPSY (CB)						
+/- FV, CE, US, OM, FNA						
First screens	188		5		193	
Subsequent screens	374		13		387	
Sub-total	562	*27.6%*	18	*7.7%*	580	*25.6%*
DIAGNOSTIC OPEN BIOSY (DOB)						
+/- any of the above procedures						
First screens	24		13		37	
Subsequent screens	50		41		91	
Sub-total	74	*3.6%*	54	*23.0%*	128	*5.6%*
TOTAL						
First screens	704		73		777	
Subsequent screens	1,329		162		1,491	
ALL SCREENS	2,033	*100%*	235	*100%*	2,268	*100%*

RECOMMENDATION AFTER ASSESSMENT

At the completion of all non-surgical assessment visits, including early review visits, a recommendation is made to return to routine screening, be treated for a malignancy or, in the case of an equivocal lesion, to return for further assessment, which may include open biopsy or early review. Table 17 lists the types of recommendations made at this stage.

Of the 3,726 women assessed, 3,171 (85%) had a normal or benign outcome without the need for surgical biopsy. Diagnostic open biopsy was recommended for 3% of women assessed, or 0.2% of all screens. The open biopsy recommendation rates were 2% and 0.1% lower, respectively, than in 1998/1999 and easily met the National Accreditation Requirement that less than 2% of women screened be referred for open biopsy.

The pre-surgical cancer detection rate was 8.5% of the women assessed. The next stage of their management involved treatment, usually by surgery such as a local excision or mastectomy, in conjunction with adjuvant therapy. Details of their treatment are listed in the section on management of breast cancer in this Report (from page 33).

Some women (3%) were requested to return for another assessment visit in six month's time. The most common reason for early review is if an asymmetric density is present but considered likely to be normal tissue, the abnormality is not visible on ultrasound, or in situations where the woman declines further biopsy. Every effort is made to minimise the number of visits by the woman for further investigations following the assessment visit and within six months of the initial mammogram – this number should normally not exceed 5% of the total women assessed. In the previous reporting year 6% of the women assessed were asked to return for early review.

The category 'Other' includes unusual cases such as therapeutic excisions for a benign lesion, incomplete assessments, or a leaking prosthesis where the women will be under the future care of the surgeon. A woman who has, by her own choice, an incomplete assessment is usually assigned a rescreen period of one year for her next screening round.

TABLE 17. RECOMMENDATION AFTER ASSESSMENT BY ROUND BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group						50-69		All ages	
Recommendation	<40	40-49	50-59	60-69	70-79	80+	No. Screens	%	No. Screens	%
FIRST SCREENS										
Definitive Treatment for Cancer	0	17	27	8	7	1	35	*6.5%*	60	*5.0%*
Diagnostic Open Biopsy	0	15	11	7	3	0	18	*3.4%*	36	*3.0%*
Early Review	0	14	19	7	2	1	26	*4.9%*	43	*3.6%*
Other	0	4	1	0	0	0	1	*0.2%*	5	*0.4%*
Return to routine screening	2	573	362	94	27	1	456	*85.1%*	1,059	*88.0%*
Sub-total	2	623	420	116	39	3	536	*100%*	1,203	*100%*
SUBSEQUENT SCREENS										
Definitive Treatment for Cancer	0	11	109	116	19	1	225	*11.2%*	256	*10.1%*
Diagnostic Open Biopsy	0	13	34	30	8	0	64	*3.2%*	85	*3.4%*
Early Review	0	5	43	14	4	0	57	*2.8%*	66	*2.6%*
Other	0	2	1	1	0	0	2	*0.1%*	4	*0.2%*
Return to routine screening	1	355	1,050	615	86	5	1,665	*82.7%*	2,112	*83.7%*
Sub-total	1	386	1,237	776	117	6	2,013	*100%*	2,523	*100%*
ALL SCREENS										
Definitive Treatment for Cancer	0	28	136	124	26	2	260	*10.2%*	316	*8.5%*
Diagnostic Open Biopsy	0	28	45	37	11	0	82	*3.2%*	121	*3.2%*
Early Review	0	19	62	21	6	1	83	*3.3%*	109	*2.9%*
Other	0	6	2	1	0	0	3	*0.1%*	9	*0.2%*
Return to routine screening	3	928	1,412	709	113	6	2,121	*83.2%*	3,171	*85.1%*
TOTAL	3	1,009	1,657	892	156	9	2,549	*100%*	3,726	*100%*

Table 18 classifies the recommendations after assessment into those within the program and those conducted outside the program. The latter category includes women who may have had diagnostic further views within the program but chose to have further assessment done privately. Because diagnostic further views are always program-funded, the 1458 women who returned to routine screening after further views have been excluded to avoid bias in the data.

Pre-operative recommendations for treatment for cancer for all screens were higher in program-funded assessments than for assessments outside the program (14% vs. 11%). Conversely, the recommendation for diagnostic open biopsy was twice as common for women assessed outside the program. Requests to return for early review were also more common in non-program assessments.

TABLE 18. RECOMMENDATION AFTER ASSESSMENT BY FUNDING, JULY 1999 TO JUNE 2000

	Assessment within Program			Assessment outside Program			All assessments		
Recommendation	50-69	All ages	%	50-69	All ages	%	50-69	All ages	%
FIRST SCREENS									
Definitive Treatment for Cancer	33	57	*8.1%*	2	3	*4.2%*	35	60	*7.7%*
Diagnostic Open Biopsy	13	26	*3.7%*	5	10	*14.1%*	18	36	*4.6%*
Early Review	19	31	*4.4%*	7	12	*16.9%*	26	43	*5.5%*
Other	1	3	*0.4%*	0	2	*2.8%*	1	5	*0.6%*
Return to routine screening	270	589	*83.4%*	15	44	*62.0%*	285	633	*81.5%*
Sub-total	336	706	*100%*	29	71	*100%*	536	777	*100%*
SUBSEQUENT SCREENS									
Definitive Treatment for Cancer	206	236	*17.4%*	19	20	*14.7%*	225	256	*17.1%*
Diagnostic Open Biopsy	58	74	*5.4%*	6	11	*8.1%*	64	85	*5.7%*
Early Review	41	46	*3.4%*	16	20	*14.7%*	57	66	*4.4%*
Other	1	2	*0.1%*	1	2	*1.5%*	2	4	*0.3%*
Return to routine screening	790	1,000	*73.6%*	62	83	*61.0%*	852	1,083	*72.5%*
Sub-total	1,096	1,358	*100%*	104	136	*100%*	2,013	1,494	*100%*
ALL SCREENS									
Definitive Treatment for Cancer	239	293	*14.2%*	21	23	*11.1%*	260	316	*13.9%*
Diagnostic Open Biopsy	71	100	*4.8%*	11	21	*10.1%*	82	121	*5.3%*
Early Review	60	77	*3.7%*	23	32	*15.5%*	83	109	*4.8%*
Other	2	5	*0.2%*	1	4	*1.9%*	3	9	*0.4%*
Return to routine screening	1,060	1,589	*77.0%*	77	127	*61.4%*	1,137	1,716	*75.6%*
TOTAL	1,432	2,064	*100%*	133	207	*100%*	2,549	2,271	*100%*

DEFINITIVE DIAGNOSIS

Of the women who underwent assessment, 90% were given a benign diagnosis, while 10% had a diagnosis of cancer. This outcome is similar to that of 1998/1999 (90% and 9%, respectively). Seven women declined to complete their assessment.

The table shows the distribution by screening round of the outcomes of the 3,726 women who underwent assessment. Forty three percent of women with a benign outcome required only further mammographic views whilst 57% required ultrasound or biopsy to reach a benign diagnosis. As in 1998/1999, a higher proportion of first screens required further assessment to obtain the benign outcome.

Of those women assessed, more malignancies were detected per woman screened in subsequent screens (12%) than in first screens (6%).

Of the 360 malignancies detected after assessment, two were non-breast cancers (lymphomas) and are not counted in the Tables which follow showing information on breast cancers.

Two of the 358 breast cancers were detected at early review and are thus considered interval cancers. The characteristics of these two cancers are also excluded from Tables 20 onward.

TABLE 19. OUTCOME OF ASSESSMENT BY ROUND, JULY 1999 TO JUNE 2000

	First screens			Subsequent screens			All screens		
Outcome	No. assessments	% of outcome	% of total	No. assessments	% of outcome	% of total	No. assessments	% of outcome	% of total
BENIGN OUTCOMES									
After further views	426	*38%*		1,029	*46%*		1,455	*43%*	
After further assessment	706	*62%*		1,198	*54%*		1,904	*57%*	
Total	1,132	*100%*	*94.1%*	2,227	*100%*	*88.3%*	3,359	*100%*	*90.2%*
MALIGNANT OUTCOMES									
Malignant - breast	68	*100%*		290	*99%*		358	*99%*	
Malignant - other	0	*0.0%*		2	*0.7%*		2	*0.6%*	
Total	68	*100%*	*5.7%*	292	*100%*	*11.6%*	360	*100%*	*9.7%*
INCOMPLETE / UNKNOWN	3		*0.2%*	4		*0.2%*	7		*0.2%*
TOTAL OUTCOMES	1,203		*100%*	2,523		*100%*	3,726		*100%*

METHOD OF PATHOLOGICAL DIAGNOSIS

Table 20 displays the assessment procedure or surgical procedure that yielded the definitive pathological diagnosis of breast cancer. One women classified as 'Other' had a pre-existing untreated cancer detected at her previous screening visit.

Fine needle cytology produced the most diagnoses (61%), followed by core biopsy (29%). Pre-operative diagnosis was thus made in 90% of women who had a cancer detected. Relatively more core biopsies than fine needle aspirates were used to detect cancers in first screens than in subsequent screens. This may be related to the presence of calcifications most commonly identified in the first screening mammograms and the employment of core biopsy as the most appropriate investigative tool in these cases.

In 1998/1999 diagnostic open biopsy was the second most common procedure after fine needle biopsy to provide the diagnosing pathology (24% and 19%, respectively). In 1999/2000 core biopsies had overtaken the reliance on open biopsies and provided the diagnosis at a nearly 3-fold higher rate. The progressive importance of core biopsy for providing tissue for diagnoses, with the corresponding fall in the reliance on surgical biopsy tissue, is seen in Figure 6. These figures, like those in Tables 17 and 18, reflect the emphasis in the screening program on obtaining a definitive diagnosis without the need for surgical biopsy.

TABLE 20. PROCEDURE YIELDING THE DEFINITIVE PATHOLOGICAL DIAGNOSIS OF BREAST CANCER BY ROUND, JULY 1999 TO JUNE 2000

	First screens		Subsequent screens		All screens	
Procedure	No. cancers	%	No. cancers	%	No. cancers	%
Fine needle aspiration	36	*52.9%*	180	*62.5%*	216	*60.7%*
Core biopsy	24	*35.3%*	78	*27.1%*	102	*28.7%*
Diagnostic open biopsy	8	*11.8%*	29	*10.1%*	37	*10.4%*
Mastectomy	0	*0.0%*	0	*0.0%*	0	*0.0%*
Other	0	*0.0%*	1	*0.3%*	1	*0.3%*
TOTAL BREAST CANCERS	68	*100%*	288	*100%*	356	*100%*

FIGURE 6. METHOD OF PATHOLOGICAL DIAGNOSIS, 1996/1997 TO 1999/2000

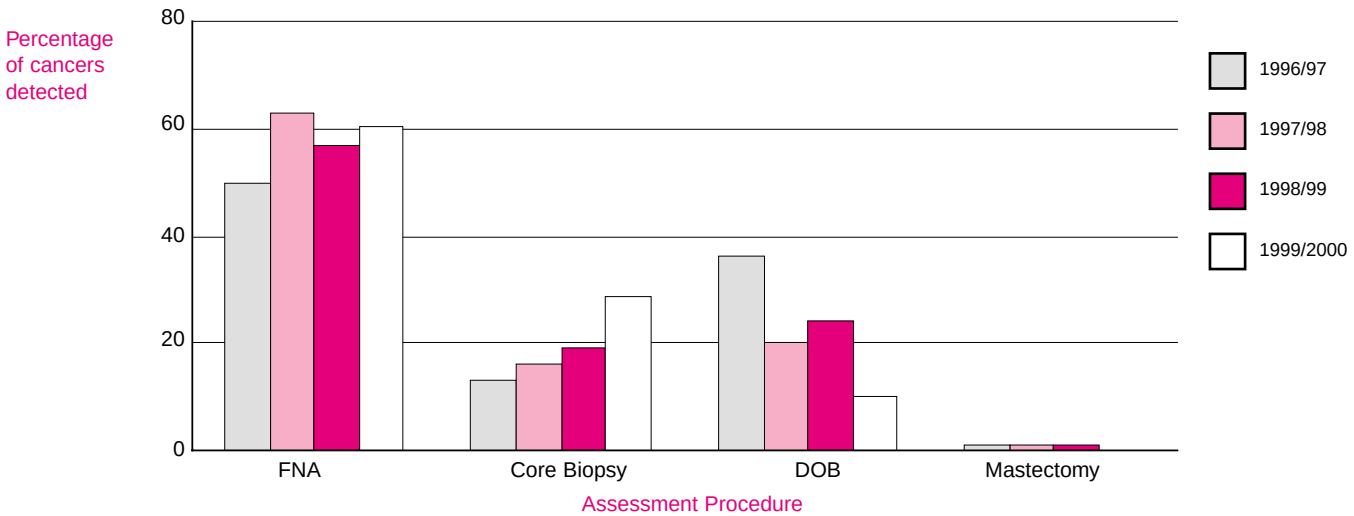


Table 21 and Figure 7 compare the investigations that yielded a pathological diagnosis of breast cancer within and outside the program. The 'Outside the program' category counts women who had no program-funded assessment visits other than any diagnostic further mammographic views (on the mobile screening units in the country) which are always program-funded.

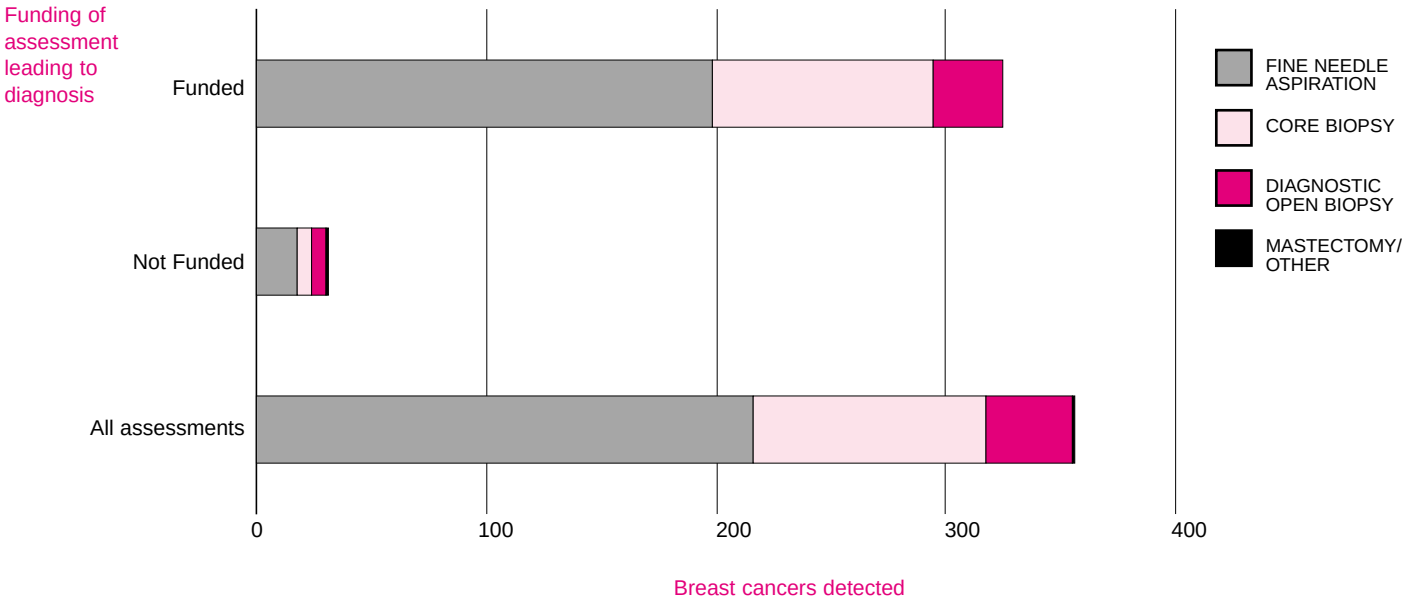
Ninety one percent (325) of breast cancers in 1999/2000 were diagnosed within the program. Most cancers were detected by fine needle aspirates whether the assessment was program funded or not (61% and 58%, respectively).

While the number of cancers detected by non-program assessors was low, and has been falling steadily since 1998/1999 as the number of assessments outside the program has fallen, there is a clear difference in the reliance on open biopsy versus core biopsy between the two systems. Relatively more core biopsies were the diagnostic procedure within the program (30% vs. 19%); the converse of this was the non-program reliance on open biopsy where they were used at twice the rate (19% vs. 10%) to achieve a diagnosis.

TABLE 21. PROCEDURE YIELDING THE PATHOLOGICAL DIAGNOSIS OF BREAST CANCER BY FUNDING, JULY 1999 TO JUNE 2000

	Assessment within Program		Assessment outside Program		All assessments	
Procedure	No. cancers	%	No. cancers	%	No. cancers	%
Fine needle aspiration	198	*60.9%*	18	*58.1%*	216	*60.7%*
Core biopsy	96	*29.5%*	6	*19.4%*	102	*28.7%*
Diagnostic open biopsy	31	*9.5%*	6	*19.4%*	37	*10.4%*
Mastectomy	0	*0.0%*	0	*0.0%*	0	*0.0%*
Other	0	*0.0%*	1	*3.2%*	1	*0.3%*
TOTAL BREAST CANCERS	325	*100%*	31	*100%*	356	*100%*

FIGURE 7. HISTOLOGICAL METHOD OF DIAGNOSIS OF BREAST CANCER BY FUNDING, JULY 1999 TO JUNE 2000



DIAGNOSTIC OPEN BIOPSY OUTCOMES

Previous statistical reports have reported the benign:malignant open biopsy ratio to express the number of benign results compared to all malignancies detected in the period. With needle biopsies becoming the predominant diagnostic tool, recommendations for open biopsy have declined except in cases where the presence of cancer cannot be ruled out on core or fine needle biopsy. Thus the number of open biopsies with benign outcomes, as a proportion of the total number of cancers detected, should be low. The ratio is no longer reported to the National Program as of 2002 so only the outcomes of the biopsies are presented in Table 22[6]. Table 23 compares the outcome of diagnostic open biopsies within and outside the program.

In 1999/2000 70% of open biopsies were benign and 30% malignant. The percentage of benign outcomes has risen since 1998/1999 when the equivalent rates were 57% and 43%, respectively. The growing rate of benign outcomes reflect the fact that these lesions are difficult to diagnose by any other means and most of them are fibroadenomas, radial scars, papillomas or benign breast changes.

TABLE 22. OUTCOMES OF DIAGNOSTIC OPEN BIOPSY (DOB) PROCEDURES BY ROUND BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group													
	40-49		50-59		60-69		70-79		80+		50-69		All ages	
Outcomes of DOB	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%
BENIGN OUTCOMES														
First screens	13		10		5		0		0		15		28	
Subsequent screens	10		29		21		1		0		50		61	
Sub-total	23	*82.1%*	39	*78.0%*	26	*68.4%*	1	*9.1%*	0	–	65	*73.9%*	89	*70.1%*
MALIGNANT OUTCOMES														
First screens	2		1		2		3		0		3		8	
Subsequent screens	3		10		10		7		0		20		30	
Sub-total	5	*17.9%*	11	*22.0%*	12	*31.6%*	10	*90.9%*	0	–	23	*26.1%*	38	*29.9%*
TOTAL DOBs PERFORMED														
First screens	15		11		7		3		0		18		36	
Subsequent screens	13		39		31		8		0		70		91	
TOTAL	28	*100%*	50	*100%*	38	*100%*	11	*100%*	0	–	88	*100%*	127	*100%*

[6] Tables 22 and 23 exclude interval cancer cases and include one case where the malignant lesion was diagnosed on fine needle biopsy but a second lesion was referred for DOB; hence the total of 38 malignant outcomes of open biopsy is one more than the 37 diagnoses from open biopsies shown in Table 20.

TABLE 23. OUTCOMES OF DIAGNOSTIC OPEN BIOPSY (DOB) PROCEDURES BY ROUND BY FUNDING, JULY 1999 TO JUNE 2000

	Assessment within Program				Assessment outside Program				All biopsies			
	50-69		All ages		50-69		All ages		50-69		All ages	
Outcomes of DOB	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%
BENIGN OUTCOMES (A)												
First screens	11		19		4		9		15		28	
Subsequent screens	44		51		6		10		50		61	
Sub-total	55	*75.3%*	70	*68.6%*	10	*66.7%*	19	*76.0%*	71	*80.7%*	89	*70.1%*
MALIGNANT OUTCOMES												
First screens	2		7		1		1		3		8	
Subsequent screens	16		25		4		5		20		30	
Sub-total	18	*24.7%*	32	*31.4%*	5	*33.3%*	6	*24.0%*	23	*26.1%*	38	*29.9%*
TOTAL DOBs PERFORMED												
First screens	13		26		5		10		18		36	
Subsequent screens	60		76		10		15		70		91	
TOTAL	73	*100%*	102	*100%*	15	*100%*	25	*100%*	88	*100%*	127	*100%*

DETECTION RATES

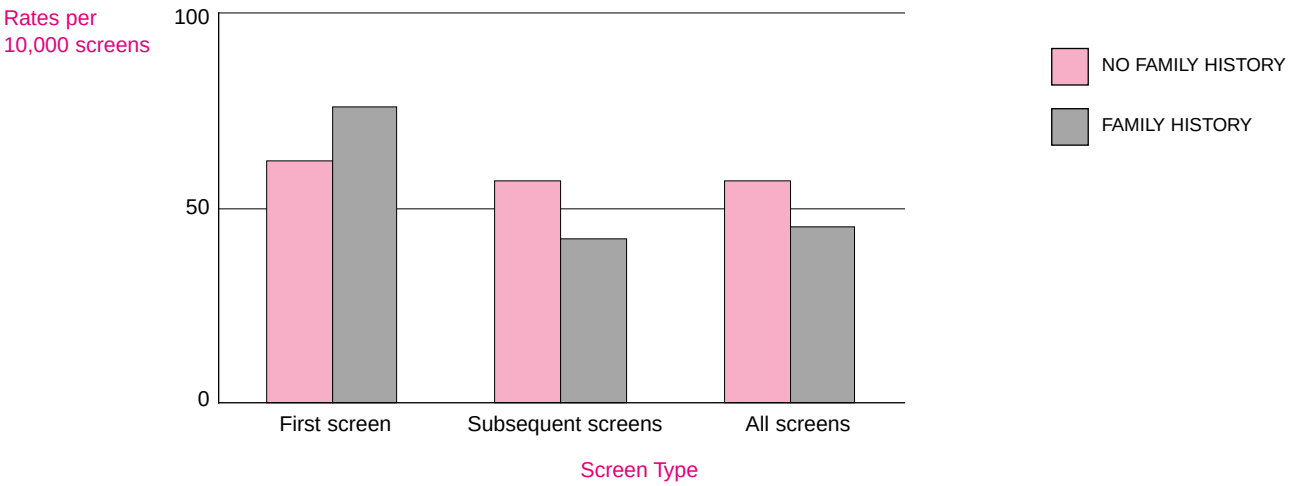
Table 24 displays the numbers of breast cancers detected in 1999/2000 by age group. Figure 8 shows detection rates by family history of breast cancer. The data include all breast cancers where the pathology is determined to be either invasive or ductal carcinoma *in situ* (DCIS); two cases where surgical treatment was not conducted and pathology could not be confirmed are excluded. Two interval cancers detected at early review are not included. No cancers were detected in women under the age of 40 years.

Of the 354 breast cancers detected, 78% (275) were classified as invasive and 22% (79) as DCIS. The breast cancer detection rate for first screens was 63 per 10,000 screens and for subsequent screens was 54 per 10,000 screens. National Accreditation Requirements were exceeded as the minimum requirement is for 50 per 10,000 first screens and 20 per 10,000 subsequent screens. For women with a family history of breast cancer, detection rates for first screens were 1.2 times higher than rates in women without a family history of breast cancer but 0.7 times the rate in subsequent screens.

TABLE 24. BREAST CANCER NUMBERS AND DETECTION RATE BY ROUND BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group													
	40-49		50-59		60-69		70-79		80+		50-69		All ages	
Type of Cancer	No. cancers	%	No. cancers	%	No. cancers	%	No. cancers	%	No. cancers	%	No. cancers	%	No. cancers	%
INVASIVE CANCERS														
First screens	15		19		8		10		1		27		53	
Subsequent screens	7		91		102		21		1		193		222	
Sub-total	22	*66.7%*	110	*74.8%*	110	*80.9%*	31	*86.1%*	2	*100.0%*	220	*77.7%*	275	*77.7%*
DCIS														
First screens	4		9		2		0		0		11		15	
Subsequent screens	7		28		24		5		0		52		64	
Sub-total	11	*33.3%*	37	*25.2%*	26	*19.1%*	5	*13.9%*	0	*0.0%*	63	*22.3%*	79	*22.3%*
ALL BREAST CANCERS														
First screens	19		28		10		10		1		38		68	
Subsequent screens	14		119		126		26		1		245		286	
TOTAL	33	*100%*	147	*100%*	136	*100%*	36	*100%*	2	*100%*	283	*100%*	354	*100%*
RATE PER 10,000 SCREENS														
First screens	35.5		73.1		94.8		241.5		188.7		77.8		63.4	
Subsequent screens	19.6		48.6		68.5		93.8		71.4		57.1		54.0	
All screens	26.4		51.9		69.9		113.0		103.6		59.2		55.6	

FIGURE 8. BREAST CANCER DETECTION RATES BY FAMILY HISTORY STATUS, JULY 1999 TO JUNE 2000



HISTOLOGIC TYPE OF BREAST CANCERS

Table 25 lists the invasive and *in situ* breast cancers by histological type and attendance round. Also included are two cancers classified as either non-breast or secondary malignancies.

Seventy seven percent of all cancers were invasive, regardless of screening round. These proportions are similar to those found in 1998/1999. The National Accreditation standard is that 10-20% of cancers detected will be DCIS. For all screening rounds, the majority of cancers were invasive ductal types followed in number by lobular classical and mixed ductal/lobular types. Comedo and non-comedo ductal *in situ* cancers were the most common non-invasive cancers.

TABLE 25. NUMBER OF SCREEN-DETECTED CANCERS BY HISTOLOGY BY ROUND, JULY 1999 TO JUNE 2000

	First screen		Subsequent screens		All screens	
Type of Cancer	No. cancers	%	No. cancers	%	No. cancers	%
INVASIVE CANCERS						
Invasive Ductal not otherwise specified	39	*73.6%*	167	*75.2%*	206	*74.9%*
Tubular	2	*3.8%*	17	*7.7%*	19	*6.9%*
Cribriform	1	*1.9%*	0	*0.0%*	1	*0.4%*
Mucinous (Colloid)	0	*0.0%*	3	*1.4%*	3	*1.1%*
Medullary	0	*0.0%*	0	*0.0%*	0	*0.0%*
Lobular Classical	9	*17.0%*	19	*8.6%*	28	*10.2%*
Lobular Variant	0	*0.0%*	5	*2.3%*	5	*1.8%*
Mixed Ductal/Lobular	2	*3.8%*	11	*5.0%*	13	*4.7%*
Total invasive cancers	53	*100%*	222	*100%*	275	*100%*
NON-INVASIVE CANCERS						
Comedo DCIS	4	*26.7%*	22	*34.4%*	26	*32.9%*
Non-comedo DCIS	9	*60.0%*	30	*46.9%*	39	*49.4%*
Mixed DCIS	1	*6.7%*	10	*15.6%*	11	*13.9%*
Other DCIS	1	*6.7%*	2	*3.1%*	3	*3.8%*
Total non-invasive cancers	15	*100%*	64	*100%*	79	*100%*
NON-BREAST CANCERS	0		2		2	
UNKNOWN PATHOLOGY	0		2		2	
TOTAL CANCERS	68		290		358	

CANCER SIZE

The aim of mammographic screening is to diagnose cancers early in their development to minimise the risk of spread of invasive cancers and to reduce the morbidity associated with surgical intervention. The National Accreditation Requirements current at the time of the screens reported here specified that Services must aim to detect at least 8 invasive cancers of 10mm or less per 10,000 screens, a minimum standard that was easily met by the programs. Since then, 'small' cancers have been newly defined as those less than 15mm, so cancer sizes from 15mm upwards also have been shown in the Table 26 and have been focussed on in following tables.

Of the 275 invasive cancers detected, 183 (67%) were <=15mm in diameter and 99 (36%) were less than 10mm. This latter figure represents 16 per 10,000 screens and comfortably met the accreditation minimum standard.

TABLE 26. NUMBER OF INVASIVE BREAST CANCERS BY SIZE, JULY 1999 TO JUNE 2000

	First screen		Subsequent screens				
Type of Cancer	No. cancers	%	No. cancers	%	All cancers	%	Rates per 10,000 screens
INVASIVE CANCERS							
<=10 mm	15	*28.3%*	84	*37.8%*	99	*36.0%*	16
<=15 mm	33	*62.3%*	150	*67.6%*	183	*66.5%*	29
16-25 mm	13	*24.5%*	55	*24.8%*	68	*24.7%*	11
26-50 mm	5	*9.4%*	15	*6.8%*	20	*7.3%*	3
>50 mm	2	*3.8%*	2	*0.9%*	4	*1.5%*	1
Size unknown	0	*0.0%*	0	*0.0%*	0	*0.0%*	
TOTAL	53	*100%*	222	*100%*	275	*100%*	43

Table 27 below shows cancer size grouped by 10-year age groups. Regardless of age group, the majority of invasive cancers detected were less than 15mm but the highest proportions of small cancers were detected in older age groups. The invasive cancer detection rate for all ages was 43 per 10,000 screens and 46 per 10,000 screens in the target age group.

TABLE 27. NUMBER OF INVASIVE BREAST CANCERS BY AGE GROUP, JULY 1999 TO JUNE 2000

	Age group															
	40-49		50-59		60-69		70-79		80+		50-69		All ages		Rates per 10,000 screens	Rates per 10,000 screens in 50-69 yr age group
Type of cancer	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
INVASIVE CANCERS																
<=10 mm	6	*27.3%*	40	*36.4%*	44	*40.0%*	8	*25.8%*	1	*50.0%*	84	*38.2%*	99	*36.0%*	16	18
<=15 mm	13	*59.1%*	68	*61.8%*	77	*70.0%*	23	*74.2%*	2	*100.0%*	145	*65.9%*	183	*66.5%*	29	30
16-25 mm	7	*31.8%*	31	*28.2%*	23	*20.9%*	7	*22.6%*	0	*0.0%*	54	*24.5%*	68	*24.7%*	11	11
26-50 mm	1	*4.5%*	10	*9.1%*	8	*7.3%*	1	*3.2%*	0	*0.0%*	18	*8.2%*	20	*7.3%*	3	4
>50 mm	1	*4.5%*	1	*0.9%*	2	*1.8%*	0	*0.0%*	0	*0.0%*	3	*1.4%*	4	*1.5%*	1	1
Size unknown	0	*0.0%*	0	*0.0%*	0	*0.0%*	0	*0.0%*	0	*0.0%*	0	*0.0%*	0	*0.0%*	-	-
TOTAL	22	*100%*	110	*100%*	110	*100%*	31	*100%*	2	*100%*	220	*100%*	275	*100%*	43	46

NODAL STATUS

The following table shows nodal status by size and type of tumour. Of the 241 women with invasive cancer who had axillary node excision, 27% (64) showed metastatic involvement. This compares with 26% in 1998/1999. Lymph nodes were examined in all cases where the cancer was greater than 25mm. Highest rates of lymph node metastases occurred in the largest cancers.

Of the 24% of women with DCIS who underwent axillary dissection none were found to be node positive. Fewer women underwent nodal dissection for *in situ* breast cancers than in 1998/1999 (33%), most likely because the invasive status was already known by the time of surgery due to the improvement in pre-surgical diagnoses.

TABLE 28. LYMPH NODE REMOVAL AND METASTATIC STATUS, JULY 1999 TO JUNE 2000

Type of Cancer	No. of cancers (A)	No. where lymph nodes were excised (B)	% of cancers where lymph nodes were excised (B/A)	No. where lymph nodes had metastasis (C)	% of cancers where lymph nodes had metastasis (C/B)
NON-INVASIVE CANCERS					
Ductal Cancer *in situ* (DCIS)	79	19	*24.1%*	0	*0.0%*
INVASIVE CANCERS					
<=15mm	183	151	*82.5%*	28	*18.5%*
16-25mm	68	66	*97.1%*	22	*33.3%*
26-50mm	20	20	*100%*	10	*50.0%*
>50mm	4	4	*100%*	4	*100%*
Size unknown	0	0	*0.0%*	0	*0.0%*
Total invasive breast cancers	275	241	*87.6%*	64	*26.6%*
NON-BREAST CANCERS	2	2	*100%*	1	*0.0%*
TOTAL CANCERS	356	262	*73.6%*	65	*24.8%*

GRADE OF CANCERS

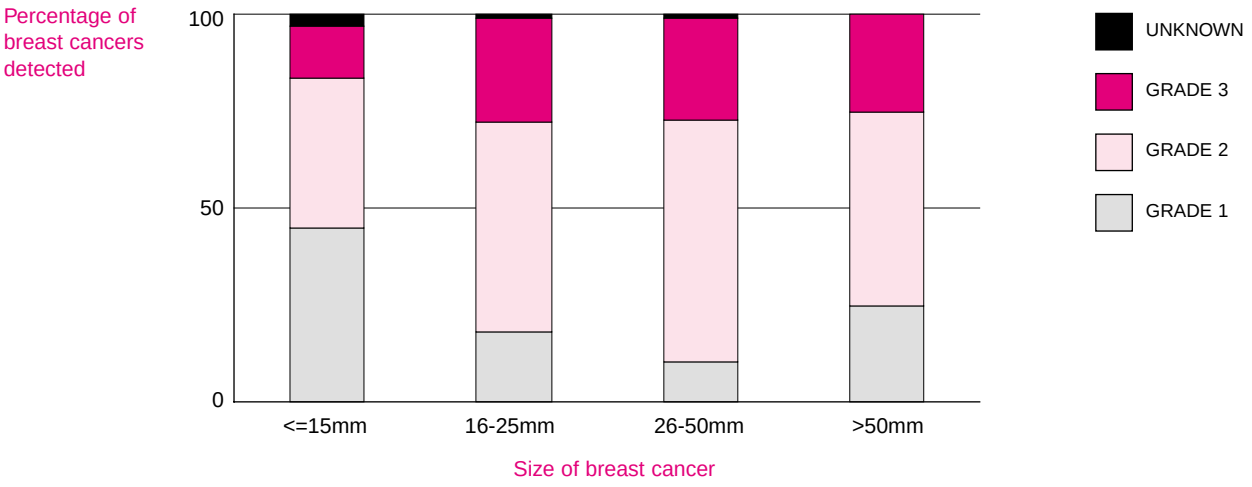
Table 29 and Figure 9 show the histological grade of screen-detected invasive cancers relative to the size of the cancer. The grade is assigned according to the method originally described by Bloom and Richardson and subsequently modified by Elston (1987).[7] Grade 1 represents a well differentiated, grade 2 a moderately differentiated and grade 3 a poorly differentiated, tumour. Higher grades have a poorer prognosis.

Although most cancers detected by the program were less than 15mm and all but four of the cancers were less than 50mm, the data suggest that, in general, the smaller the cancer at detection the better the differentiation and the prognosis. Information on tumour grade was not available for five cancers.

TABLE 29. NUMBER OF INVASIVE BREAST CANCERS BY HISTOLOGICAL GRADE BY SIZE, JULY 1999 TO JUNE 2000

	Size of invasive breast cancer									
	<=15mm		16-25mm		26-50mm		>50mm		Total	
Histological grade	No. cancers	%	No. cancers	%	No. cancers	%	No. cancers	%	No. cancers	%
Grade 1	84	*45.9%*	12	*17.6%*	2	*10.0%*	1	*25.0%*	99	*36.0%*
Grade 2	71	*38.8%*	37	*54.4%*	12	*60.0%*	2	*50.0%*	122	*44.4%*
Grade 3	25	*13.7%*	18	*26.5%*	5	*25.0%*	1	*25.0%*	49	*17.8%*
Unknown	3	*1.6%*	1	*1.5%*	1	*5.0%*	0	*0.0%*	5	*1.8%*
TOTAL INVASIVE BREAST CANCERS	183	*100%*	68	*100%*	20	*100%*	4	*100%*	275	*100%*

FIGURE 9. PROPORTIONS OF INVASIVE BREAST CANCERS BY HISTOLOGICAL GRADE BY SIZE, JULY 1999 TO JUNE 2000



[7] *Elston, CW. Grading of invasive carcinoma of the breast. In 'Diagnostic Histopathology of the Breast'. DL Page and TJ Anderson. Churchill Livingstone 1987.*

CANCER TREATMENT

Lesions diagnosed as malignant were removed in all but four cases, where surgical treatment at that time was deemed inappropriate (Table 30). Breast conserving surgery comprises those cases where localised excision or lumpectomy was performed to remove a lesion already identified as malignant or where the lesion was completely removed at the time of a diagnostic open biopsy. Some women may have also undergone re-excision to provide greater clearance around the lesion or to remove lymph nodes not previously excised. Complete removal of the breast was the first choice of some women or as a secondary surgical treatment after a malignancy was confirmed on diagnostic open biopsy.

Most malignancies were removed using breast-conserving techniques. The rate of conservative surgery has increased since 1998/1999 from 64% to 70%. The proportion of women choosing mastectomy fell by 7% compared with 1998/1999 to 29%, the first time since the start of the program where it has fallen below 30% (Table 30). Mastectomy was more common for *in situ* cancers than invasive cancers (Table 31). Pathology and hence breast cancer type was unknown in two cases.

TABLE 30. NUMBER OF SURGICAL PROCEDURES FOR BREAST CANCER TREATMENT BY ROUND, JULY 1999 TO JUNE 2000

	First screens		Subsequent screens		All screens	
Surgical procedure for treatment	No. procedures	%	No. procedures	%	No. procedures	%
Breast conserving surgery	44	*64.7%*	204	*70.8%*	248	*69.7%*
Mastectomy	23	*33.8%*	81	*28.1%*	104	*29.2%*
No surgery / unknown	1	*1.5%*	3	*1.0%*	4	*1.1%*
TOTAL BREAST CANCERS	68	*100%*	288	*100%*	356	*100%*

In two of the four cases where surgical treatment was not performed, the type of breast cancer (invasive or DCIS) was unknown. These cases are not included in Table 31. Breast conserving surgery was performed relatively more frequently than mastectomy with invasive cancers than with DCIS. *In situ* cancers tend to be larger and more diffuse and mastectomy is often the preferred treatment option with these cancers.

TABLE 31. NUMBER OF SURGICAL PROCEDURES FOR BREAST CANCER TREATMENT BY TYPE OF CANCER, JULY 1999 TO JUNE 2000

	Invasive cancers		DCIS		All cancers	
Surgical procedure for treatment	No. procedures	%	No. procedures	%	No. procedures	%
Breast conserving surgery	199	*72.4%*	49	*62.0%*	248	*70.1%*
Mastectomy	75	*27.3%*	29	*36.7%*	104	*29.4%*
No surgery / unknown	1	*0.4%*	1	*1.3%*	2	*0.6%*
TOTAL BREAST CANCERS	275	*100%*	79	*100%*	354	*100%*

Thirty eight percent of women resident in rural or remote areas chose to have a mastectomy compared with 26% of women living in the metropolitan area (Table 32). In 1998/1999, 47% of country women and 32% of metropolitan women chose mastectomy. Breast-conserving surgery was the preferred option for the majority of women regardless of place of residence.

TABLE 32. NUMBER OF SURGICAL PROCEDURES PERFORMED FOR TREATMENT OF BREAST CANCER BY PLACE OF RESIDENCE, JULY 1999 TO JUNE 2000

	Metropolitan		Country		Total	
Surgical procedure for treatment	No. procedures	%	No. procedures	%	No. procedures	%
Breast conserving surgery	192	*73.6%*	56	*58.9%*	248	*69.7%*
Mastectomy	68	*26.1%*	36	*37.9%*	104	*29.2%*
No surgery / unknown	1	*0.4%*	3	*3.2%*	4	*1.1%*
TOTAL BREAST CANCERS	261	*100%*	95	*100%*	356	*100%*

ADJUVANT THERAPY

Adjuvant therapy was given to 80% of women with breast cancers diagnosed. Radiotherapy and Tamoxifen, alone or in combination, were the most common follow-up treatments. Ninety percent of women with invasive breast cancers and 40% of those with DCIS received some sort of adjuvant therapy.

TABLE 33. ADJUVANT THERAPY FOR TREATMENT OF BREAST CANCER BY TYPE OF CANCER, JULY 1999 TO JUNE 2000

	Invasive		DCIS		Total	
Adjuvant therapy	No. procedures	%	No. procedures	%	No. procedures	%
Chemotherapy	8	*2.9%*	0	*0.0%*	8	*2.3%*
Radiotherapy	41	*15.0%*	10	*12.7%*	51	*14.4%*
Tamoxifen	46	*16.8%*	10	*12.7%*	56	*15.9%*
Chemotherapy & Radiotherapy	17	*6.2%*	0	*0.0%*	17	*4.8%*
Chemotherapy & Tamoxifen	7	*2.6%*	0	*0.0%*	7	*2.0%*
Radiotherapy & Tamoxifen	112	*40.9%*	12	*15.2%*	124	*35.1%*
Chemotherapy & Radiotherapy & Tamoxifen	17	*6.2%*	0	*0.0%*	17	*4.8%*
Radiotherapy & Other	0	*0.0%*	0	*0.0%*	0	*0.0%*
Tamoxifen & Other	0	*0.0%*	0	*0.0%*	0	*0.0%*
Other	3	*1.1%*	0	*0.0%*	3	*0.8%*
None/Unknown	23	*8.4%*	47	*59.5%*	70	*19.8%*
TOTAL BREAST CANCERS	274	*100%*	79	*100%*	353	*100%*

Interval Cancer Rate

Interval cancers are invasive breast cancers that are diagnosed in the period between routine screenings, that is, after a screening mammogram that detected no abnormality and before the next screening episode.

Women are considered at risk of interval cancer for differing periods post-screening depending on risk factors such as a personal or a family history of breast cancer. These women are screened at one year intervals in the BreastScreen WA program and are 'at risk' for 12 months after their last normal screen. They are only included in the interval cancer count for those first 12 months. Conversely, those recommended for 2 yearly screening are included in the interval cancer count for both the first 12-month period as well as the 13 to 24 month period post-screening. Interval cancers for 0 to 12 months and 13 to 24 months are calculated per 10,000 screens as the number of interval breast cancers divided by the number of women years at risk.

Table 34 shows the interval cancer rates by age group and screening round for screens from January to December 1998. The interval cancer rate for the first 12 months following a normal screen in 1998 was 4.1 per 10,000 first screens and 8.8 per 10,000 subsequent screens. The rate for all age groups for the period from 13 to 24 months after a normal screen in 1998 was 7.0 per 10,000 first screens and 10.6 per 10,000 subsequent screens. Only two of these women had a clinical symptom (a breast lump) at the time of the 1998 screen, a number too small to conduct meaningful comparisons between asymptomatic and symptomatic interval cancer rates.

The National Accreditation Requirements at the time covered by this report state that no more than 6 per 10,000 women screened will develop breast cancer in the 12 months following screening.

TABLE 34. INTERVAL CANCER RATES FOR 1998 SCREENS BY ROUND BY AGE GROUP

	Age group					
Screen type and time since last screen	40-49	50-59	60-69	70+	50-69	Total
FIRST SCREENS						
Cancers detected between 0-12 months						
Number of interval cancers	3	2	1	0	3	6
Number of women years at risk	6,352	5,060	2,115	958	7,175	14,485
Interval Cancer Rate	4.7	4.0	4.7	0.0	4.2	4.1
Cancers detected between 13-24 months						
Number of interval cancers	4	3	3	0	6	10
Number of women years at risk	6,281	4,983	2,075	939	7,058	14,278
Interval Cancer Rate	6.4	6.0	14.5	0.0	8.5	7.0
SUBSEQUENT SCREENS						
Cancers detected between 0-12 months						
Number of interval cancers	10	21	11	0	32	42
Number of women years at risk	6,652	22,087	16,502	2,524	38,589	47,765
Interval Cancer Rate	15.0	9.5	6.7	0.0	8.3	8.8
Cancers detected between 13-24 months						
Number of interval cancers	6	22	13	2	35	43
Number of women years at risk	5,427	19,014	13,909	2,051	32,923	40,401
Interval Cancer Rate	11.1	11.6	9.3	9.8	10.6	10.6
ALL SCREENS						
Cancers detected between 0-12 months						
Number of interval cancers	13	23	12	0	35	48
Number of women years at risk	13,004	27,147	18,617	3,482	45,764	62,250
Interval Cancer Rate	10.0	8.5	6.4	0.0	7.6	7.7
Cancers detected between 13-24 months						
Number of interval cancers	10	25	16	2	41	53
Number of women years at risk	11,708	23,997	15,984	2,990	39,981	54,679
Interval Cancer Rate	8.5	10.4	10.0	6.7	10.3	9.7

Appendix – Minimum performance standards

Minimum standards and requirements are in place for accredited services operating within BreastScreen Australia. The table below summarises the performance of BreastScreen WA against selected National Accreditation Requirements (1994) using the information presented in this Report.[8] Since 2001 new and additional minimum standards have been developed for the national program.

Standard	Performance Objective	Minimum Standard	BreastScreen WA Performance
1.2	To maximise the number of women screened who are aged 50-69 with the aim of screening 70% of this group.	Participation by 60% of the target group after five years in the program.	Participation to June 2000 was 52%.
1.3	To maximise participation by Aboriginal and Torres Strait Islander women and women from non-English speaking backgrounds.	In urban areas, participation by Aboriginal and Torres Strait Islander women and women from non-English speaking backgrounds will be at least 50% of the rate for the general population.	Participation to June 2000 was 33% and 104%, respectively, of the rate for the general urban population.
1.5	To maximise client acceptance of the Service as evidenced by high participation rates among those invited for routine rescreening.	>= 75% of women aged 50-69 years screened will be rescreened within the recommended interval.	71% of women aged 50-69 screened in 1997/1998 returned for a rescreen within 27 months.
2.9	To minimise the number of women recalled for mammographic assessment.	Assessment recalls < 10% of women screened at prevalent round and <5% at incident round.	11% of first screens and 5% of subsequent screens were recalled for assessment.
2.18	To minimise the proportion of women referred for open biopsy.	Referrals for open biopsy will be <2% of all women screened.	0.2% of women screened were referred for open diagnostic biopsy.
2.23	To maximise the number of cancers detected.	At least 50 cancers per 10,000 women screened will be detected in prevalent rounds, and at least 20 per 10,000 women screened in incident rounds.	63 cancers per 10,000 first screens and 54 cancers per 10,000 subsequent screens.
2.24	To maximise the number of minimal invasive cancers detected.	At least 8 per 10,000 women screened will be found to have invasive cancers <=10mm diameter on pathology.	16 invasive breast cancers less than 10mm were detected per 10,000 screens.
2.25	To detect a representative proportion of ductal carcinoma *in situ* (DCIS) at the prevalent screening round.	10-20% of cancers detected will be DCIS.	22% of all cancers detected were DCIS.
2.26	To minimise the number of interval cancers.	No more than 6 per 10,000 women screened will develop breast cancer (including DCIS, but excluding LCIS[9]) in the 12 months following screening.	In the period 0 - 12 months following a screen, the interval cancer rate was 4.1 per 10,000 first screens and 8.8 per 10,000 subsequent screens.

[8] Although the National Accreditation Requirements refer to screens as 'prevalent' and 'incident', data throughout this Report uses the terminology 'first' and 'subsequent' instead.

[9] LCIS refers to Lobular Carcinoma in situ