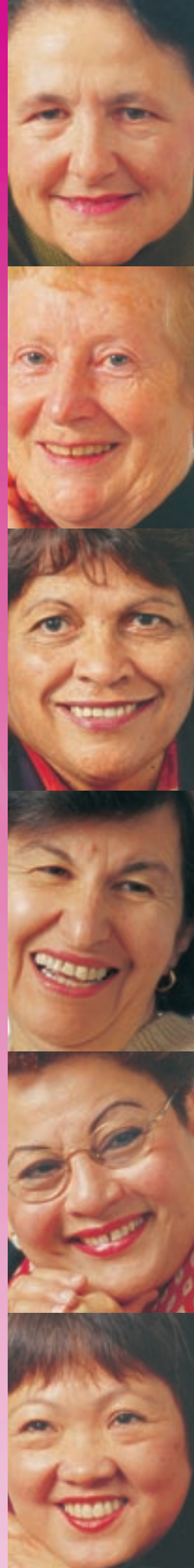


BreastScreen WA

1998 - 1999 STATISTICAL REPORT



BreastScreen WA
Public Health Division
Department of Health

9th Floor Eastpoint Plaza
233 Adelaide Terrace
PERTH WA 6000

Telephone: (08) 9237 6900

Fax: (08) 9237 6999

Web site: www.breastscreen.health.wa.gov.au

Contents



<i>FOREWORD</i>	4
<i>INTRODUCTION</i>	5
<i>BREASTSCREEN WA KEY RESULTS FOR 1998/99</i>	6
<i>SUMMARY OF THE OUTCOMES OF BREAST CANCER SCREENING IN 1998/99</i>	7
<i>BREASTSCREEN WA</i>	8
<i>PARTICIPATION RATES</i>	9
<i>CHARACTERISTICS OF WOMEN SCREENED</i>	12
<i>Type of attendance</i>	12
<i>Area of residence</i>	13
<i>Indigenous women</i>	14
<i>Women from culturally and linguistically diverse backgrounds</i>	14
<i>Personal history of breast cancer</i>	15
<i>Family history of breast cancer</i>	15
<i>Women reporting symptoms at screen</i>	16
<i>Hormone replacement therapy status</i>	17
<i>Women with breast implants</i>	17
<i>RESCREEN RATES</i>	18
<i>OUTCOMES OF SCREENING</i>	19
<i>OUTCOMES OF ASSESSMENT</i>	20
<i>Assessment procedures</i>	20
<i>The definitive diagnostic procedure</i>	22
<i>Recommendation after assessment</i>	24
<i>Definitive diagnosis</i>	26
<i>Method of pathological diagnosis</i>	27
<i>Benign to malignant open biopsy ratio</i>	29
<i>BREAST CANCER DETECTION</i>	31
<i>Detection rates</i>	31
<i>Histologic type of breast cancers</i>	32
<i>Cancer size and lymph node involvement</i>	33
<i>Grade of cancers</i>	35
<i>MANAGEMENT OF BREAST CANCER</i>	36
<i>Cancer treatment</i>	36
<i>Adjuvant therapy use</i>	38
<i>Interval cancer rate</i>	39
<i>APPENDIX – MINIMUM PERFORMANCE STANDARDS</i>	40

Breast Screen Tables and Figures

Table 1.	Participation rates by place of residence by age group, July 1997 to June 1999	9
Table 2.	Number of screens by round by age, July 1998 to June 1999	12
Table 3.	Number of women screened by place of residence by age group, July 1998 to June 1999	13
Table 4.	Number of Aboriginal and Torres Strait Islander (ATSI) women screened by age group, July 1998 to June 1999	14
Table 5.	Number of women screened by language spoken at home by age group, July 1998 to June 1999	14
Table 6.	Number of screens where women reported personal history of breast cancer by age group, July 1998 to June 1999	15
Table 7.	Number of screens where women reported a family history of breast cancer by age group, July 1998 to June 1999	15
Table 8.	Number of screens where women reported symptoms by age group, July 1998 to June 1999	16
Table 9.	Number of screens where women reported using HRT by age group, July 1998 to June 1999	17
Table 10.	Number of screens where women had breast implants by age group, July 1998 to June 1999	17
Table 11.	Number of women who returned for routine rescreen within 27 months of their 1996/97 screening	18
Table 12.	Outcomes of screening by round by age group, July 1998 to June 1999	19
Table 13.	Assessment procedures performed by round, July 1998 to June 1999	20
Table 14.	Assessment procedures, excluding diagnostic further views, by funding, 21 July 1998 to June 1999	21
Table 15.	Assessment procedures yielding a definitive diagnosis by round by age group, July 1998 to June 1999	22
Table 16.	Assessment procedures yielding a definitive diagnosis by funding, July 1998 to June 1999	23
Table 17.	Recommendation after assessment by round by age group, July 1998 to June 1999	24
Table 18.	Recommendation after assessment by funding, July 1998 to June 1999	25
Table 19.	Outcome of assessment by round, July 1998 to June 1999	26
Table 20.	Procedure yielding the definitive pathological diagnosis of breast cancer by round, July 1998 to June 1999	27
Table 21.	Procedure yielding the pathological diagnosis of breast cancer by funding, July 1998 to June 1999	28
Table 22.	Outcomes of diagnostic open biopsy (DOB) procedures by round by age group, July 1998 to June 1999	29
Table 23.	Outcomes of diagnostic open biopsy (DOB) procedures by round by funding, July 1998 to June 1999	30
Table 24.	Breast cancer detection rate by round by age group, July 1998 to June 1999	31
Table 25.	Number of cancers detected by histology by round, July 1998 to June 1999	32
Table 26.	Number of invasive breast cancers by size by round, July 1998 to June 1999	33



Table 27.	Lymph node removal and metastatic status, July 1998 to June 1999	34
Table 28.	Number of invasive breast cancers by histological grade by size, July 1998 to June 1999	35
Table 29.	Number of surgical procedures for breast cancer treatment by round, July 1998 to June 1999	36
Table 30.	Number of surgical procedures for breast cancer treatment by type of cancer, July 1998 to June 1999	36
Table 31.	Number of surgical procedures for breast cancer treatment by place of residence, July 1998 to June 1999	37
Table 32.	Adjuvant therapy for treatment of breast cancer by type of cancer, July 1998 to June 1999	38
Table 33.	Interval cancer rates for 1997 screens by round by age group	39
Figure 1.	Participation rates by age group from 1994/96 to 1997/99	10
Figure 2.	Participation rates of indigenous women by place of residence by age group, July 1997 to June 1999	10
Figure 3.	Participation rates of women speaking a language other than English at home by place of residence by age group, July 1997 to June 1999	11
Figure 4.	Number of screens by round by 12-month period between 1989/1990 and 1998/1999	12
Figure 5.	Percentage of women screened by place of residence by age group, July 1998 to June 1999	13
Figure 6.	Method of pathological diagnosis, 1996/97 to 1998/99	27
Figure 7.	Histological method of diagnosis of breast cancer by funding, July 1998 to June 1999	28
Figure 8.	Breast cancer detection rates by family history status, July 1998 to June 1999	31
Figure 9.	Proportions of invasive breast cancers by histological grade by size, July 1998 to June 1999	35

It is with great pleasure that I present the BreastScreen WA 1998/1999 Statistical Report.

Breast cancer is the most common cancer, and the most common cause of cancer death, in Australian women. Early detection has been shown to reduce the morbidity and mortality associated with this type of cancer.

BreastScreen WA provides equitable access to free screening mammograms for all women over the age of 40 in Western Australia. The program also provides multidisciplinary teams of experienced specialists at dedicated breast assessment centres to assess screen-detected lesions.

In 1998/99 BreastScreen WA completed a major restructure of its State Coordination Unit (SCU), the screening services and the assessment service. The changes allowed a greater integration between the screening and assessment services so that BreastScreen WA could successfully apply for accreditation under the National Accreditation Requirements of BreastScreen Australia. The most significant changes resulted in:

- *Assessment clinics being provided by Breast Assessment WA at two public hospital sites, where previously four hospitals had conducted the assessments;*
- *Diagnostic further views for metropolitan clients performed at the assessment centres rather than at the screening units as had been the case since the early 1990's. Clients screened at country mobile clinics continued to be offered further views at the mobile unit;*
- *A Medical Director to manage the Service and head the multidisciplinary assessment team;*
- *More efficient staffing structures and procedures at both the SCU and the screening services, and SCU office renovations to accommodate the changed workflows;*
- *An upgraded Y2K compliant Mammography Screening Registry database incorporating more in-built quality assurance facilities and available on-line at the two assessment clinics for direct entry of assessment procedures.*

This report reflects the transition and implementation period of these changes from early 1998 to mid 1999. During this time, clinic capacities were for a time reduced and screening restrictions were put in place to ease the transition to the new assessment centres. Despite the demands on resources and staff during this period of change, the program performed 58,811 screens, 20% of which were first screens. In August 2001 the Service conducted its 500,000th screening mammogram and to date has screened 185,000 Western Australian women. The program has detected 2,500 breast cancers.

I would like to commend the commitment and dedication of staff and stakeholders and acknowledge the consistent support from clients.



Dr Elizabeth Wylie

Medical Director

10th September 2001

Introduction



This is the fifth BreastScreen WA Annual Statistical Report and reflects ten years of continuous service to the women of Western Australia. The Report presents summary data for screens performed from 1 July 1998 to 30 June 1999 and their outcomes.

General population statistics, used in presenting target population numbers, were drawn from the Australian Bureau of Statistics 1998 Estimated Resident Population data. 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 from culturally and linguistically diverse backgrounds.

A comparison of BreastScreen WA's performance against a selected number of performance standards included in National Accreditation Requirements (1994) is presented in the Appendix. The National Accreditation Requirements document is referred to a number of times in the text; it describes the minimum standards and requirements developed by the National Accreditation Committee for accredited services operating within the national program BreastScreen Australia. Whilst the National Accreditation Requirements refer to screens as 'prevalent' and 'incident', we have used the terminology 'first' and 'subsequent' instead.

Where relevant, comparisons between assessments performed inside and outside the program are included. That is, procedures and outcomes of women who had at least some investigations and/or diagnostic open biopsy funded by the program were compared with those of women who had all of their assessment privately. This is the last reporting year where a significant proportion of assessments was non-funded. Greater integration of screening and assessment in future will see the bulk of assessments carried out within the program, through Breast Assessment WA.

Very sincere thanks are extended to all staff of BreastScreen WA and the radiologists, pathologists and surgeons for their continuing dedication and commitment to the program and to the women of Western Australia over the past ten years.

BreastScreen WA would like to thank the Public Reporting Working Group for their expert advice and guidance in the production of this Report. The Working Group comprised Dr Belinda Hansen, General Practitioner and Dr Vivienne Dawes, Public Health Physician and five BreastScreen WA members: Dr Elizabeth Wylie, Medical Director; Ms Cynthia Leal, Senior Project Officer; Ms Lynley Coen, Coordinator, Health Promotion; Dr Mandy Seel, GP Liaison Officer; Ms Jan Tresham, Coordinator, Data Management.



ATTENDANCE

- BreastScreen WA performed 58,811 screens between July 1998 and June 1999. Of these 20% were first screens and 80% subsequent screens. The 50-69 year target age group made up 74% of all screens.
- Of the women aged 50-69 years who had a two-yearly rescreen recommendation in the previous round, 73% returned to BreastScreen WA for a rescreen within the following 27 months.
- Although the program screened 2,588 more women in the target age group than in the 24 months to June 1998, the 24-month participation rate to June 1999 remained at 53%.

DEMOGRAPHY

- Seventy percent of all women screened in 1998/99, and of women in the target age group, lived in the metropolitan area.
- The service screened 510 women of Aboriginal or Torres Strait Islander background and 6,378 women of culturally and linguistically diverse background.
- In the 24 months to July 1999, approximately 50% of the women aged 50-69 years living in the metropolitan areas of Perth attended for screening. The participation rate for the same age group for metropolitan women from culturally and linguistically diverse backgrounds was 50% while for indigenous women was 22%.

RECALL TO ASSESSMENT

- Of the 43,378 women screened aged 50-69 years, 95% 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.
- The overall recall rate was 6% of all screens, or 10% for first and 5% for subsequent screens. These recall rates met the minimum performance standards set by BreastScreen Australia.
- Of those women attending for assessment, 90% had a benign outcome, 9% had a malignancy detected and less than 1% had an incomplete or unknown assessment outcome.

ASSESSMENT PROCEDURES

- On average, each woman recalled for assessment underwent 2.3 assessment procedures. Seventy percent required only further mammographic views, clinical examination and/or ultrasound to confirm an outcome indicating no significant abnormality.
- Seventy six percent of all cancers were diagnosed preoperatively. Fifty seven percent were diagnosed by fine needle aspiration and 19% by core biopsy. The proportions diagnosed using cytological analysis of the fine needle aspirate have decreased by 6% but diagnosis by core biopsy histology has increased by 3%, compared with 1997/98.
- Twenty four percent of all cancers were diagnosed by surgical biopsy. Of all women screened, 0.3% were referred for surgical biopsy. This referral rate was well within the BreastScreen Australia accreditation minimum standard requiring <2% of women screened to be referred for open diagnostic biopsy.

CANCER DETECTION RATE

- A total of 325 breast cancers were screen-detected, which represents 0.6% of all women screened. The overall cancer detection rate was 55 per 10,000 women screened. Of these, 21% were *in situ* cancers and 79% were invasive, with 38% of the latter being less than or equal to 10mm diameter on pathology.
- The cancer detection rates for first and subsequent screens, and the detection rate of small cancers, easily met the performance standards set by BreastScreen Australia.
- Interval cancer rates for screens in 1997 were 6.6 and 9.4 per 10,000 for first and subsequent screens, respectively, for the 12 months following a normal mammogram.

TREATMENT

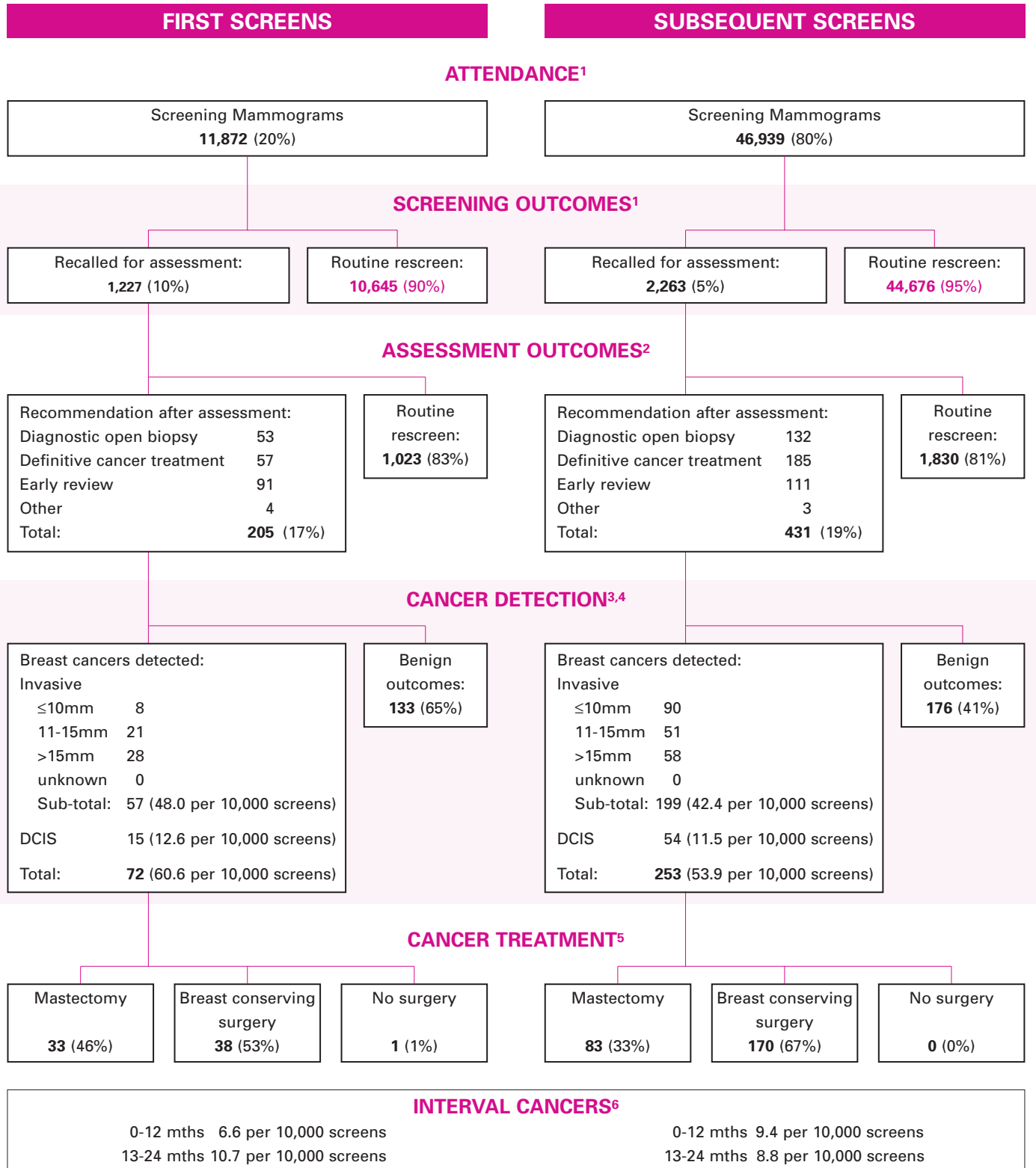
- Localised surgical excision was used to remove 64% of malignancies detected. One third of all women with breast cancer chose to have a mastectomy, and mastectomy was more frequently chosen by those living in country areas compared with those women resident in the Perth metropolitan area.



Summary of Outcomes of

Breast Cancer Screening in 1998/99

The key outcomes from screening and assessment for 1998/99 are summarised in the table below. Assessment outcomes are included for all women assessed, whether the assessment was done within the program or privately, and include details from two women who underwent assessment despite a normal mammogram. The 'other' category includes unknown or incomplete assessment information.



SOURCE: ¹ Table 12; ² Table 17; ³ Table 25; ⁴ Table 26; ⁵ Table 29; ⁶ Table 33.

The screening program BreastScreen WA, part of BreastScreen Australia, 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 which 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 by 1995 a fully-fledged statewide service. The program is free of charge for all women and operates within the Western Australian Department of Health, with funding from both the State and Commonwealth Governments.

BreastScreen WA is responsible for managing the statewide screening service through the State Coordination Unit (SCU) in Perth. Recruitment strategies are developed by the SCU in consultation with consumer and health professional reference groups. The SCU handles appointment bookings for all screening units, and these are coordinated 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 mobile unit visiting a south east town.

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.

BreastScreen WA also provides assessment of screen-detected abnormalities up to definitive diagnosis, including diagnostic open biopsy. In early 1999 the practice of all women returning to the screening unit for their diagnostic further views changed. Metropolitan clients were invited to attend one of the two assessment centres in Perth, whilst country clients generally still had their further views done on the mobile unit. At around the same time, Breast Care Nurses replaced Medical Officers at the SCU in the management of the personalised recall procedures. The nurses inform women and their nominated general practitioner of the need for further assessment, organise appointments at the program assessment centres, assist with assessment procedures and offer support and advice to women at their assessment visit.

Some women chose to be assessed privately, outside the program, under the direction of their general practitioner. Because nearly all diagnostic further views were done within the program in 1998/99, and for the majority of women this was the only assessment procedure required, only 9% of all women assessed had no stage of their assessment funded. Details of these non-funded procedures are included in this Report so that the whole-of-state breast cancer screening and assessment outcomes may be determined. In addition, a comparison of assessment data with the previous year, where applicable, has been included.

Participation Rates



BreastScreen Australia's National Accreditation Requirements state that, for services operating for at least five years, participation rates of women in the 50-69 year age group should reach a minimum of 60%, with the overall aim of the program being to screen 70% of this target group. The participation rate is calculated as the proportion of eligible women in the target age group screened at least once over a 24-month period.

The statewide participation rate has remained at 53% (Table 1) compared to the previous reporting period, the 24 months to June 1998. The population for the target age group, the denominator for the rate calculation, increased by just over 5,870. This increase was not matched by an equivalent increase in screening numbers. Although the program screened 2,588 more women in the target age group in the 24 months to June 1999, the disruption caused by the restructure of the service, referred to in the Foreword to this report, meant that the screening rate did not outstrip this increase in the population base.

To June 1999, not all clinics had yet been operating for a full five year period, with the two most recent beginning service in Perth City and outer metropolitan areas in 1995.

TABLE 1. PARTICIPATION RATES BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1997 TO JUNE 1999

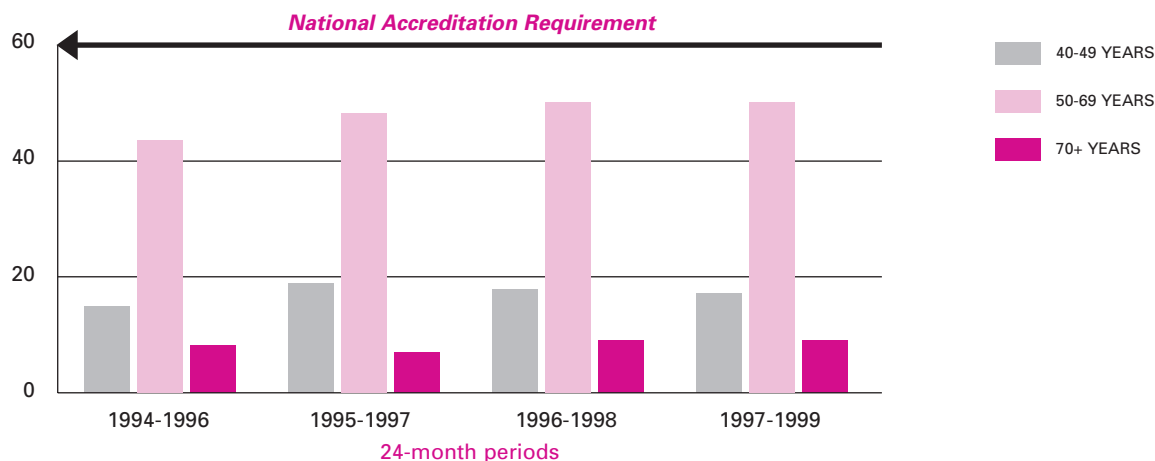
Place of residence	Age group			Total
	40-49	50-69	70+	
METROPOLITAN				
Number of women screened	16,650	58,985	4,724	80,359
Estimated female resident population	102,752	118,541	59,788	281,081
<i>% population screened</i>	16.2%	49.8%	7.9%	28.6%
COUNTRY				
Number of women screened	7,569	24,016	2,145	33,730
Estimated female resident population	32,785	38,744	16,761	88,290
<i>% population screened</i>	23.1%	62.0%	12.8%	38.2%
TOTAL				
Number of women screened	24,219	83,001	6,869	114,089
Estimated female resident population	135,537	157,285	76,549	369,371
<i>% population screened</i>	17.9%	52.8%	9.0%	30.9%

Source: BreastScreen WA, Mammography Screening Registry

Participation rates for the whole of the state have steadily increased since the program's inception. Figures for the target age group (59-69 years) for four consecutive 24-month periods, through to June 1999, are illustrated below (Figure 1), with data for the two other age groups (40-49 years and 70+ years) also shown for comparison.

FIGURE 1. PARTICIPATION RATES BY AGE GROUP FROM 1994/96 TO 1997/99

Percentage of women screened



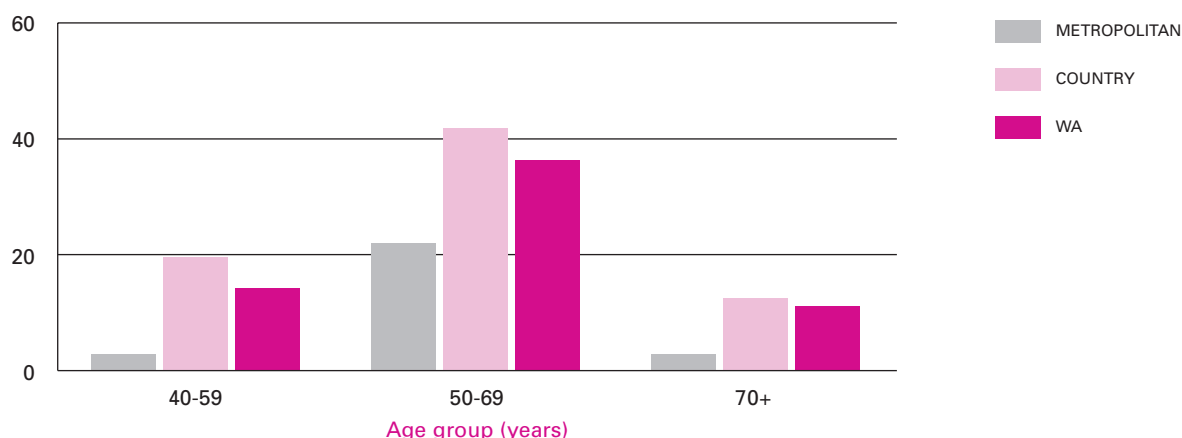
Source: BreastScreen WA, Mammography Screening Registry

The participation rate for target age group women in the metropolitan area was 50% (Table 1). The equivalent rate for indigenous women was 22% in the same period (Figure 2), an increase of 1% over the corresponding rate for the 24 months to June 1998. The Service aims for an urban indigenous 50-69 year age group participation rate that is at least 50% of the rate for the general urban population of the same age group. By these standards, BreastScreen WA requires additional efforts to better the current rate, which is equivalent to only 44% of the rate for the general urban population. It must be noted, however, that accurate up-to-date population data for indigenous women is not available and the participation rates quoted here are based on 1996 census figures.

The participation rate of indigenous women in the target age group in country Western Australia was 42%. This also represented a 1% increase on the rate for the 24-month period ending June 1998.

FIGURE 2. PARTICIPATION RATES OF INDIGENOUS WOMEN BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1997 TO JUNE 1999

Percentage of women screened



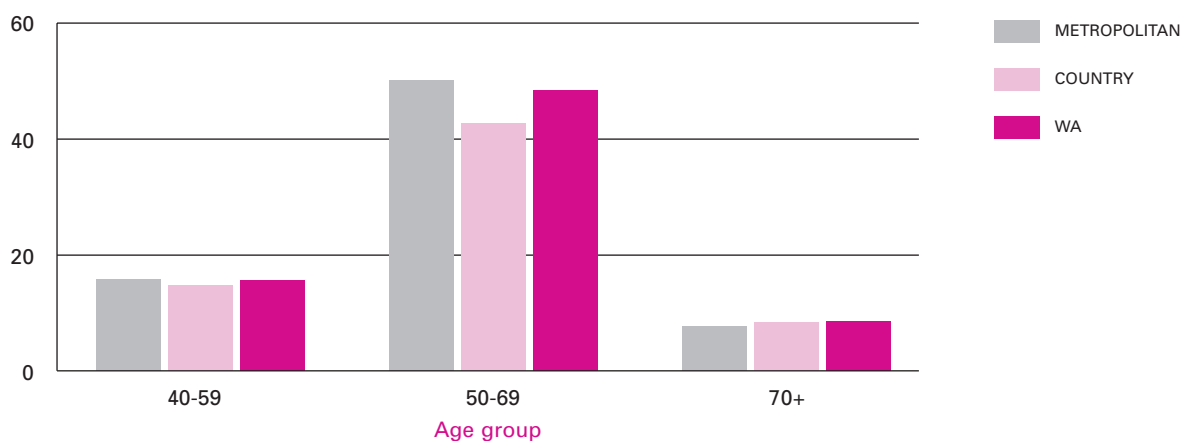
Source: BreastScreen WA, Mammography Screening Registry



The participation rate of culturally and linguistically diverse (CALD) women aged 50-69 years, speaking a language other than English at home and living in the metropolitan area, was 50% (Figure 3). This represents a 2% increase compared with the previous reporting period. A smaller increase (1%) was evident in these women living in rural or remote areas. As for urban indigenous women, the National Accreditation Requirements state that the participation rate for 50-69 year-old urban CALD women should be at least 50% of the rate for the general urban population. The metropolitan participation rate for this group of women was 100% of the rate for the general population.

FIGURE 3. PARTICIPATION RATES OF WOMEN SPEAKING A LANGUAGE OTHER THAN ENGLISH AT HOME BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1997 TO JUNE 1999

Percentage of women screened



Source: BreastScreen WA, Mammography Screening Registry

BreastScreen Characteristics of Women Screened

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 that may affect the accurate assessment of the mammogram are routinely collected at the time of screening. This information is summarised in the following sections.

TYPE OF ATTENDANCE

Classification of attendance type is based on attendance within BreastScreen WA. First screens refer to the first screen with BreastScreen WA; some of these women may have had a previous screen outside the WA program.

Table 2 shows the type of attendance, by age group, for women who were screened between 1st July 1998 and 30th June 1999. Of the 58,811 screens, 20% (11,872) were for first time attendees and the remaining 80% (46,939) were in women attending for any subsequent screen. The proportion of first screens was lower than in 1997/98 largely due to the restrictions on screening put in place during the restructure referred to in the Foreword of this report. Because our primary commitment was to those women due for a rescreen, first invitations to unscreened women were not a priority during this time.

The target age group (50-69 years) made up 74% of the total screens, an increase of 2% from the previous year.

TABLE 2. NUMBER OF SCREENS BY ROUND BY AGE, JULY 1998 TO JUNE 1999

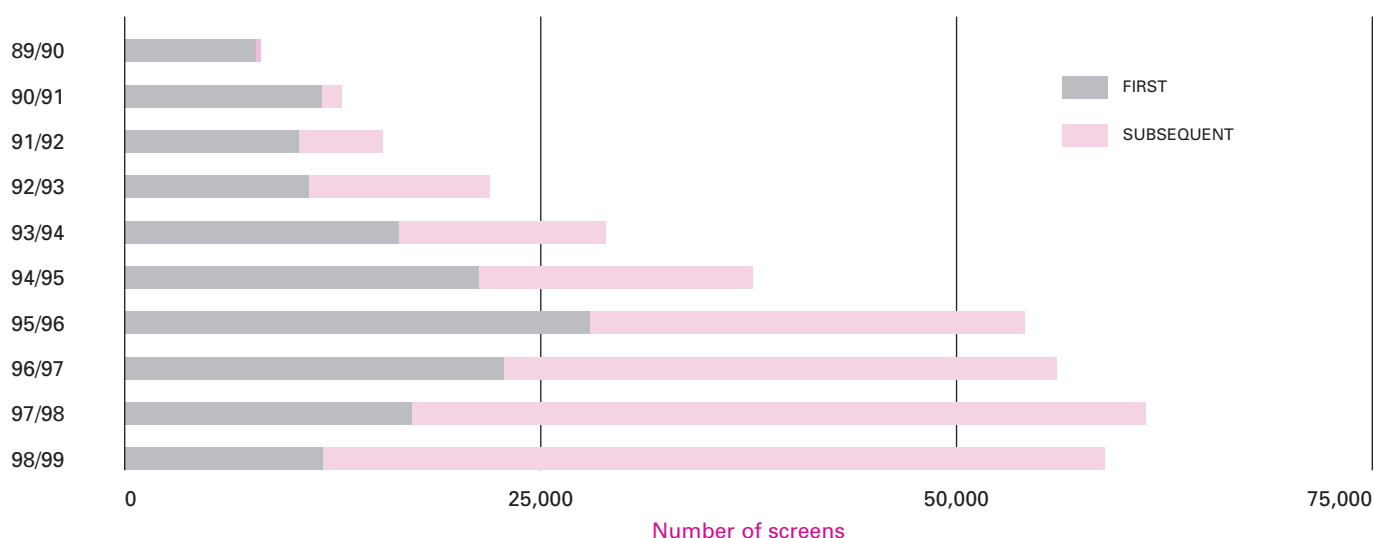
	Age group						50-69	All ages
	<40	40-49	50-59	60-69	70-79	80+		
TYPE OF ATTENDANCE								
First screens	30	5,734	3,886	1,505	642	75	5,391	11,872
% of first screens	0.3%	48.3%	32.7%	12.7%	5.4%	0.6%	45.4%	100%
Subsequent screens	4	6,294	21,668	16,318	2,498	157	37,986	46,939
% of subsequent screens	0.0%	13.4%	46.2%	34.8%	5.3%	0.3%	80.9%	100%
TOTAL								
	34	12,028	25,554	17,823	3,140	232	43,377	58,811
% of all screens	0.1%	20.5%	43.5%	30.3%	5.3%	0.4%	73.8%	100%

Source: BreastScreen WA, Mammography Screening Registry

Figure 4 shows that the proportion of women attending for rescreening continued to increase annually, an indication of high acceptance of the program amongst Western Australian women. The program screened approximately 160,200 women at least once in the ten years to the end of June 1999.

FIGURE 4. NUMBER OF SCREENS BY ROUND BY 12-MONTH PERIOD BETWEEN 1989/1990 AND 1998/1999

12 Month Periods



Source: BreastScreen WA, Mammography Screening Registry



AREA OF RESIDENCE

Approximately 75% of Western Australian women aged 50-69 years live in the metropolitan area.^{1,2} Table 3 and Figure 5 below show the number of women screened in 1998/99 according to their place of residence at the time of screening.

Seventy percent of all screens, and of screens in women aged 50-69 years, were in women resident in metropolitan areas. Both these proportions were 2% to 3% lower than in 1997/98 and there was a corresponding screening increase of 2% in all women, and 3% increase in target age women, living in country areas.

All but one woman screened under the age of 40 years resided in rural areas. 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.

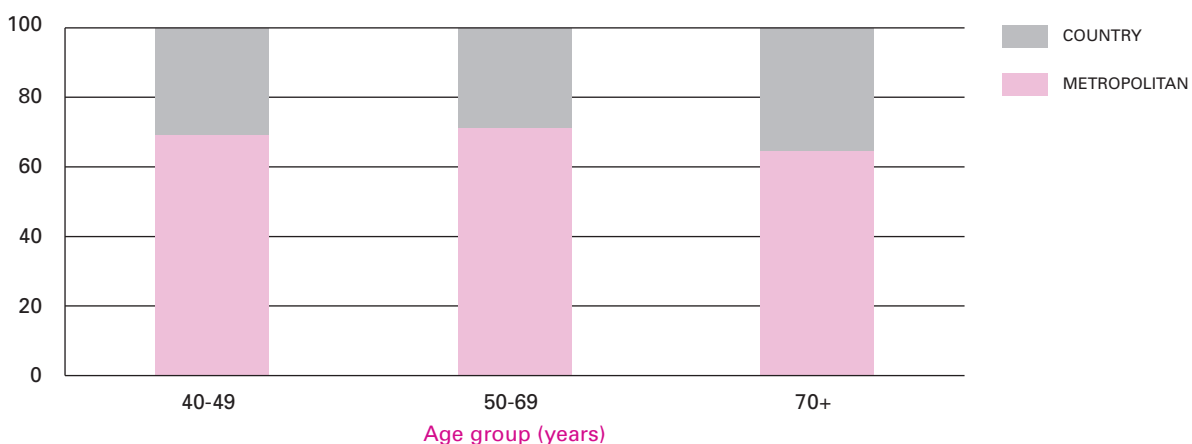
TABLE 3. NUMBER OF WOMEN SCREENED BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1998 TO JUNE 1999

Place of residence	Age group									
	<40		40-49		50-69		70+		All ages	
	No. screens	%	No. screens	%	No. screens	%	No. screens	%	No. screens	%
METROPOLITAN	1	2.9%	8,336	69.3%	30,376	70.0%	2,163	64.1%	40,876	69.5%
COUNTRY	33	97.1%	3,688	30.7%	12,980	29.9%	1,209	35.9%	17,910	30.5%
Interstate/Unknown	0	0.0%	4	0.0%	21	0.0%	0	0.0%	25	0.0%
TOTAL	34	100%	12,028	100%	43,377	100%	3,372	100%	58,811	100%

Source: BreastScreen WA, Mammography Screening Registry

FIGURE 5. PERCENTAGE OF WOMEN SCREENED BY PLACE OF RESIDENCE BY AGE GROUP, JULY 1998 TO JUNE 1999

Percentage of women screened



Source: BreastScreen WA, Mammography Screening Registry

¹ 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.

² Australian Bureau of Statistics, Estimated Residential Population, June 1998 (based on the 1996 Census).

BreastScreen Characteristics of Women Screened

INDIGENOUS WOMEN

In the 1996 Census, 1% (5,090) of all Western Australian women over the age of 40 years identified themselves as being of Aboriginal or Torres Strait Islander (ATSI) descent, with 74% of these indigenous women living in rural and remote areas.³

In 1998/99, approximately 1% of all screens performed by BreastScreen WA was for indigenous women (510) and 68% of these women were in the target age group. These proportions are representative of the percentage and age make-up of indigenous women in the total state population.

TABLE 4. NUMBER OF ABORIGINAL AND TORRES STRAIT ISLANDER (ATSI) WOMEN SCREENED BY AGE GROUP, JULY 1998 TO JUNE 1999

	Age group				All ages	% of all women
	<40	40-49	50-69	70+		
ABORIGINAL OR TORRES STRAIT ISLANDER (ATSI) WOMEN						
Number of women screened	2	137	347	24	510	0.9%
% of women screened	0.4%	26.9%	68.0%	4.7%	100%	
NON- ABORIGINAL OR TORRES STRAIT ISLANDER (ATSI) WOMEN						
Number of women screened	32	11,891	43,030	3,348	58,301	99.1%
% of women screened	0.1%	20.4%	73.8%	5.7%	100%	
ALL WOMEN						
Number of women screened	34	12,028	43,377	3,372	58,811	100%
% of women screened	0.1%	20.5%	73.8%	5.7%	100%	

Source: BreastScreen WA, Mammography Screening Registry

WOMEN FROM CULTURALLY AND LINGUISTICALLY DIVERSE BACKGROUNDS

An estimated 12% of the women in Western Australia are from culturally and linguistically diverse (CALD) backgrounds, speaking a language other than English at home. Approximately 80% of these women live in the metropolitan area.³ Table 5 shows that in the 12 months to June 1999, the program screened 6,378 CALD women, or 11% of all women screened. Seventy five percent of these women were in the 50-69 year age group.

The most common languages other than English spoken at home were 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.

TABLE 5. NUMBER OF WOMEN SCREENED BY LANGUAGE SPOKEN AT HOME BY AGE GROUP, JULY 1998 TO JUNE 1999

	Age group				All ages	% of all women
	<40	40-49	50-69	70+		
WOMEN SPEAKING A LANGUAGE OTHER THAN ENGLISH AT HOME						
Number of women screened	1	1,264	4,793	320	6,378	10.8%
% of women screened	0.0%	19.8%	75.1%	5.0%	100%	
WOMEN SPEAKING ENGLISH AT HOME						
Number of women screened	33	10,764	38,584	3,052	52,433	89.2%
% of women screened	0.1%	20.5%	73.6%	5.8%	100%	
ALL WOMEN						
Number of women screened	34	12,028	43,377	3,372	58,811	100%
% of women screened	0.1%	20.5%	73.8%	5.7%	100%	

Source: BreastScreen WA, Mammography Screening Registry

³ Australian Bureau of Statistics, Census of Population and Housing 1996.



PERSONAL HISTORY OF BREAST CANCER

One percent of all women screened either stated at the time of screening that they had had breast cancer detected outside the BreastScreen WA program or had a previous breast cancer diagnosed within the program (Table 6). These women are routinely invited for annual rescreening. They receive an annual reminder letter even though the program recognises that it may be difficult for women living outside the metropolitan area to attend a BreastScreen WA screening clinic.

TABLE 6. NUMBER OF SCREENS WHERE WOMEN REPORTED PERSONAL HISTORY OF BREAST CANCER BY AGE GROUP, JULY 1998 TO JUNE 1999

	Age group														All ages	
	<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%	44	0.4%	262	1.0%	336	1.9%	126	4.0%	29	12.5%	598	1.4%	797	1.4%
No personal history	34	100%	11,984	99.6%	25,292	99.0%	17,487	98.1%	3,014	96.0%	203	87.5%	42,779	98.6%	58,014	98.6%
ALL WOMEN SCREENED	34	100%	12,028	100%	25,554	100%	17,823	100%	3,140	100%	232	100%	43,377	100%	58,811	100%

Source: BreastScreen WA, Mammography Screening Registry

FAMILY HISTORY OF BREAST CANCER

In 1998/99 it was the policy of the Service to routinely invite all women with a family history of breast cancer in any first degree relative for annual rescreening. The first-degree relative of the women may be a mother, daughter, sister, brother, son or father. Table 7 shows that in 1998/99, 15% (9,005) of women reported some family history of breast cancer, a decrease of 1% (734) 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 (53%) aged under 40 years 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 1998 TO JUNE 1999

	Age group														All ages	
	<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	18	52.9%	1,845	15.3%	3,653	14.3%	2,870	16.1%	576	18.3%	43	18.5%	6,523	15.0%	9,005	15.3%
No family history	16	47.1%	10,183	84.7%	21,901	85.7%	14,953	83.9%	2,564	81.7%	189	81.5%	36,854	85.0%	49,806	84.7%
ALL WOMEN SCREENED	34	100%	12,028	100%	25,554	100%	17,823	100%	3,140	100%	232	100%	43,377	100%	58,811	100%

Source: BreastScreen WA, Mammography Screening Registry

BreastScreen Characteristics of Women Screened

WOMEN REPORTING SYMPTOMS AT SCREEN

Table 8 includes screens where women reported having symptoms at the time of screening. 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.

A total of 829 women screened in 1998/99 reported symptoms at the time of screening. Of these, 47% included breast lump and/or nipple discharge while 53% related to pain or other symptoms. The under-40 age group showed the highest proportion of symptoms reported (12%). For all ages combined, the percentage of women reporting pain and/or other symptoms was 0.7%.

TABLE 8. NUMBER OF SCREENS WHERE WOMEN REPORTED SYMPTOMS BY AGE GROUP, JULY 1998 TO JUNE 1999

	<40		40-49		50-59		Age group 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	3		101		107		42		18		1		149		272	
Nipple discharge	1		51		33		25		2		1		58		113	
Breast lump + nipple discharge	0		1		4		1		0		0		5		6	
Sub-total	4	11.8%	153	1.3%	144	0.6%	68	0.4%	20	0.6%	2	0.9%	212	0.5%	391	0.7%
Pain / other	0	0.0%	146	1.2%	155	0.6%	97	0.5%	35	1.1%	5	2.2%	252	0.6%	438	0.7%
TOTAL SYMPTOMS	4		299		299		165		55		7		464		829	
NO SYMPTOMS REPORTED																
	30	88.2%	11,729	97.5%	25,255	98.8%	17,658	99.1%	3,085	98.2%	225	97.0%	42,913	98.9%	57,982	98.6%
ALL WOMEN SCREENED	34	100%	12,028	100%	25,554	100%	17,823	100%	3,140	100%	232	100%	43,377	100%	58,811	100%

Source: BreastScreen WA, Mammography Screening Registry



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 percent of women reported using HRT at the time of screening, a slight decrease from the previous year (31%). The percentage of women using HRT in the target age group decreased slightly from 36% in 1997/98 to 35% in 1998/99, while the 60-69 year age group remained at 30% in the same period. Women in the 50-59 year age group reported the highest usage of HRT.

TABLE 9. NUMBER OF SCREENS WHERE WOMEN REPORTED USING HRT BY AGE GROUP, JULY 1998 TO JUNE 1999

	Age group														50-69		All ages	
	<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	1	2.9%	1,921	16.0%	9,644	37.7%	5,424	30.4%	604	19.2%	20	8.6%	15,068	34.7%	17,614	30.0%		
No HRT reported	33	97.1%	10,107	84.0%	15,910	62.3%	12,399	69.6%	2,536	80.8%	212	91.4%	28,309	65.3%	41,197	70.0%		
ALL WOMEN SCREENED	34	100%	12,028	100%	25,554	100%	17,823	100%	3,140	100%	232	100%	43,377	100%	58,811	100%		

Source: BreastScreen WA, Mammography Screening Registry

WOMEN WITH BREAST IMPLANTS

Breast implants make it more difficult to detect early cancer on a mammogram. Special compression techniques must be used and more x-rays are taken, so appointments may take a little more time than usual.

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. In addition, the result letter to the women and to their nominated general practitioner contains advice about regular self- and clinical breast examination.

Table 10 shows that there were 387 (0.7%) screens in women with breast implants, a slight (0.1%) decrease from the previous year.

TABLE 10. NUMBER OF SCREENS WHERE WOMEN HAD BREAST IMPLANTS BY AGE GROUP, JULY 1998 TO JUNE 1999

	Age group														50-69		All ages	
	<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%	92	0.8%	242	0.9%	51	0.3%	2	0.1%	0	0.0%	293	0.7%	387	0.7%		
No breast implants	34	100%	11,936	99.2%	25,312	99.1%	17,772	99.7%	3,138	99.9%	232	100%	43,084	99.3%	58,424	99.3%		
ALL WOMEN SCREENED	34	100%	12,028	100%	25,554	100%	17,823	100%	3,140	100%	232	100%	43,377	100%	58,811	100%		

Source: BreastScreen WA, Mammography Screening Registry

The rescreen rate is expressed as the percentage of women attending in 1996/97 who were recommended for two-yearly screening and returned for a rescreen within 27 months.

BreastScreen Australia's National Accreditation Requirements minimum standard requires that more than 75% of women aged 50-69 years be rescreened within the recommended interval.

Table 11 shows that 73% of women in the target age group recommended for a two-yearly screen returned to the program for a routine rescreen. The age at the time of the index year screen (that is, in 1996/97) is shown. In the target age group, relatively more women (76%) returned if they had a subsequent screen in 1996/97, compared to first attendees (66%) in that year.

Due to the restructure mentioned in the Foreword of this Report, the restriction on screening numbers meant that some metropolitan women were invited for their rescreening up to three months after their due date. Consequently, this may have adversely affected the rescreen rate.

TABLE 11. NUMBER OF WOMEN WHO RETURNED FOR ROUTINE RESCREEN WITHIN 27 MONTHS OF THEIR 1996/97 SCREENING

Type of screening	Age group			Total
	40-49	50-69	70+	
FIRST SCREENS				
Number of women screened in 1996/97	8,358	12,860	1,111	22,329
Number of women attending rescreening	5,545	8,492	199	14,236
<i>% of women rescreened</i>	66.3%	66.0%	17.9%	63.8%
SUBSEQUENT SCREENS				
Number of women screened in 1996/97	3,339	22,579	1,226	27,144
Number of women attending rescreening	2,536	17,188	511	20,235
<i>% of women rescreened</i>	76.0%	76.1%	41.7%	74.5%
TOTAL				
Number of women screened in 1996/97	11,697	35,439	2,337	49,473
Number of women attending rescreening	8,081	25,680	710	34,471
<i>% of women rescreened</i>	69.1%	72.5%	30.4%	69.7%

Source: BreastScreen WA, Mammography Screening Registry

Outcomes of Screening



Table 12 shows the outcomes of screening by round, for each age group. Of the 58,811 screens, 94% showed no mammographic abnormality and the women were returned to routine rescreen. The remaining 6% were referred on for diagnostic further views or other assessment procedures such as ultrasound, fine needle aspiration or core biopsy. The under-40 year age group had the highest recall rate (4 of 34 screens, or 12%) followed by the 40-49 age group (9%) whilst those in the target age group had a recall rate of 5%.

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 1998/99, BreastScreen WA met this requirement with 10% (first) and 5% (subsequent) of screens being recalled for assessment.

TABLE 12. OUTCOMES OF SCREENING BY ROUND BY AGE GROUP, JULY 1998 TO JUNE 1999

Outcome of screening	Age group									
						50-69		All ages		
	<40	40-49	50-59	60-69	70+	No. screens	%	No. screens	%	
FIRST SCREENS										
Routine rescreening	26	5,090	3,490	1,378	661	4,868	90.3%	10,645	89.7%	
Referred for assessment	4	644	396	127	56	523	9.7%	1,227	10.3%	
Sub-total	30	5,734	3,886	1,505	717	5,391	100%	11,872	100%	
SUBSEQUENT SCREENS										
Routine rescreening	4	5,911	20,580	15,632	2,549	36,212	95.3%	44,676	95.2%	
Referred for assessment	0	383	1,088	686	106	1,774	4.7%	2,263	4.8%	
Sub-total	4	6,294	21,668	16,318	2,655	37,986	100%	46,939	100%	
ALL SCREENS										
Routine rescreening	30	11,001	24,070	17,010	3,210	41,080	94.7%	55,321	94.1%	
Referred for assessment	4	1,027	1,484	813	162	2,297	5.3%	3,490	5.9%	
TOTAL	34	12,028	25,554	17,823	3,372	43,377	100%	58,811	100%	

Source: BreastScreen WA, Mammography Screening Registry

ASSESSMENT PROCEDURES

There were 3,489 (6%) women recalled for assessment following a suspicious mammogram, including those assessed privately. The number of assessment procedures, by screening round, performed on all women who attended assessment is shown below. BreastScreen WA followed up the assessment outcomes of women who underwent assessment privately to ensure a satisfactory outcome was achieved.

Table 13 shows the total number of all assessment procedures. An individual woman may be counted more than once if she had more than one procedure performed. Details from some women who underwent assessment despite a normal mammogram are also included for completeness.⁴

Up to April 1999, diagnostic further views were done at the screening clinics whilst other procedures were undertaken at a program assessment centre or privately, in consultation with the woman's general practitioner. A small number of women declined to have further views within the program but nevertheless had appropriate assessment work-up elsewhere. The number counted under "other mammography" includes these women, as the full details of their diagnostic mammograms such as the number and type of views could not be determined. Other mammography also includes other x-rays taken after an excisional or needle biopsy, or x-rays taken at an early review visit.

As in previous years, the most common procedure was diagnostic further mammographic views, performed on 2,976 women (85% of all women assessed) and making up 36% of all assessment procedures, followed by clinical examination (20%) and ultrasound (16%). The use of further views as a percentage of all procedures marginally increased by 0.3% compared with 1997/98 while clinical examinations, ultrasounds and fine needle aspirations each decreased by approximately 1%.

Despite the fact that most women only required diagnostic further views and had a normal outcome, the overall average was 2.3 assessment investigations per woman. Most women who required assessment other than further views had at least two other procedures, such as a clinical examination and ultrasound. One woman had two diagnostic open biopsies. Women who had more than one lesion to be assessed may have had different procedures undertaken for each lesion.

TABLE 13. ASSESSMENT PROCEDURES PERFORMED BY ROUND, JULY 1998 TO JUNE 1999

Procedure	First screens		Subsequent screens		All screens		
	No. procedures	%	No. procedures	%	No. procedures	%	
Diagnostic Further Views	1,044	35.4%	1,932	37.0%	2,976	36.4%	
Clinical examination	592	20.1%	1,074	20.6%	1,666	20.4%	
Ultrasound	509	17.3%	818	15.7%	1,327	16.3%	
Fine needle aspiration	375	12.7%	662	12.7%	1,037	12.7%	
Core biopsy	180	6.1%	349	6.7%	529	6.5%	
Other mammography	191	6.5%	241	4.6%	432	5.3%	
Diagnostic open biopsy	58	2.0%	140	2.7%	198	2.4%	
TOTAL PROCEDURES	2,949	100%	5,216	100%	8,165	100%	
Total women attending for assessment						3,489	
Average number of investigations per woman						2.3	

Source: BreastScreen WA, Mammography Screening Registry

⁴ This and subsequent tables include details from six women who underwent some procedures although they were not referred for assessment for a mammographic abnormality. These women attended assessment because of symptoms at screening or because they chose to have their technical repeats done at an assessment centre and then went on to have assessment procedures. In addition, there were six women who declined assessment.



A number of women had assessment visits both within and outside of the program. For example, some women had a clinical examination performed by a general practitioner, then attended a program assessment centre for further workup. For the purpose of this Report, 'assessment within program' includes those women who had at least one of their assessment visits funded by the program. Conversely, 'assessment outside program' includes women who had none of their assessment visits funded by the program. Table 14 compares the number of procedures where the assessment was within the BreastScreen WA program with the number of investigations outside the program.

Further mammographic views have been excluded, as the vast majority of them were program-funded. The number of procedures classed as 'other mammography' has also been excluded because, being made up of a small number of diagnostic further views performed outside the program plus other mammography, its interpretation in the overall number of procedures performed at funded assessments becomes somewhat complex.

In 1998/99, 60% (2,875) of assessment procedures, excluding diagnostic further views/further mammography, were performed within the program. This is an increase of 17% from the previous year.

Across all age groups, clinical examination was the most common procedure whether the assessment was funded or not. The largest proportions of fine needle and core biopsies were conducted at program funded assessments whilst equal numbers of diagnostic open biopsies were done within and outside program-funded assessments.

TABLE 14. ASSESSMENT PROCEDURES, EXCLUDING DIAGNOSTIC FURTHER VIEWS, BY FUNDING, JULY 1998 TO JUNE 1999

Assessment Procedures	Assessment within Program	Assessment outside Program	All procedures
CLINICAL EXAMINATION	906	760	1,666
% of clinical examinations	54.4%	45.6%	100%
ULTRASOUND	731	596	1,327
% of ultrasounds	55.1%	44.9%	100%
FINE NEEDLE ASPIRATION	706	331	1,037
% of fine needle aspirations	68.1%	31.9%	100%
CORE BIOPSY	433	96	529
% of core biopsies	81.9%	18.1%	100%
DIAGNOSTIC OPEN BIOPSY	99	99	198
% of diagnostic open biopsies	50.0%	50.0%	100%
TOTAL PROCEDURES	2,875	1,882	4,757
% all procedures	60.4%	39.6%	100%

Source: BreastScreen WA, Mammography Screening Registry

BreastScreen Outcomes of Assessment

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 them. Other mammography (OM), as shown in Table 13, has not been included here as a separate category because of the complexity of its interpretation in the overall number of procedures performed in any one assessment. However, four definitive diagnoses reached at 'other' mammography have been included as part of the 'further views' category.

Of the 3,489 women who attended for assessment, 1,899 (54%) required only diagnostic further views to reach a definitive decision, and for most women these took place at the screening clinic where she had her initial mammographic views. A further 547 (16%) women also required only non-invasive procedures such as clinical examination or ultrasound to obtain a diagnosis.

Needle biopsies, approximately half of which were fine needle aspirations, were required in 846 (24%) cases to confirm the diagnosis. Diagnostic open biopsy returned the definitive diagnosis in 197 (6%) cases; this is one less than the total number of open biopsies performed (see Tables 13 & 14) because one woman had two diagnostic biopsies.

TABLE 15. ASSESSMENT PROCEDURES YIELDING A DEFINITIVE DIAGNOSIS BY ROUND BY AGE GROUP, JULY 1998 TO JUNE 1999

Outcome of Assessment	<40		40-49		50-59		Age group 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	%
FURTHER VIEWS ONLY (FV)																
First screens	3		358		200		72		23		4		272		660	
Subsequent screens	0		222		608		354		54		1		962		1,239	
Sub-total	3	75.0%	580	56.5%	808	54.4%	426	52.4%	77	50.7%	5	41.7%	1,234	53.7%	1,899	54.4%
CLINICAL EXAMINATION (CE)																
+/- FV																
First screens	0		9		4		3		0		0		7		16	
Subsequent screens	0		9		20		7		1		0		27		37	
Sub-total	0	0.0%	18	1.8%	24	1.6%	10	1.2%	1	0.7%	0	0.0%	34	1.5%	53	1.5%
ULTRASOUND (US)																
+/- FV, CE																
First screens	1		96		62		17		6		1		79		183	
Subsequent screens	0		48		157		94		11		1		251		311	
Sub-total	1	25.0%	144	14.0%	219	14.8%	111	13.7%	17	11.2%	2	16.7%	330	14.4%	494	14.2%
FINE NEEDLE ASPIRATION (FNA)																
+/- FV, CE, US, OM																
First screens	0		88		53		20		6		2		73		169	
Subsequent screens	0		47		123		87		17		0		210		274	
Sub-total	0	0.0%	135	13.2%	176	11.9%	107	13.2%	23	15.1%	2	16.7%	283	12.3%	443	12.7%
CORE BIOPSY (CB)																
+/- FV, CE, US, OM, FNA																
First screens	0		68		54		10		9		0		64		141	
Subsequent screens	0		30		117		99		16		0		216		262	
Sub-total	0	0.0%	98	9.6%	171	11.5%	109	13.4%	25	16.4%	2	16.7%	280	12.2%	403	11.6%
DIAGNOSTIC OPEN BIOSY (DOB)																
+/- any of the above procedures																
First screens	0		25		23		5		5		0		28		59	
Subsequent screens	0		26		63		45		4		1		108		138	
Sub-total	0	0.0%	51	5.0%	86	5.8%	50	6.2%	9	5.9%	1	8.3%	136	5.9%	197	5.6%
TOTAL PROCEDURES																
First screens	4		644		396		127		49		7		523		1,227	
Subsequent screens	0		382		1,088		686		103		3		1,774		2,262	
TOTAL	4	100%	1,026	100%	1,484	100%	813	100%	152	100%	12	100%	2,297	100%	3,489	100%

Source: BreastScreen WA, Mammography Screening Registry



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 (1,899 procedures) have been excluded, as the vast majority of them were program-funded.

The higher rate of core biopsies inside the program may well be due to the lack of availability of mammogram machines in rural areas. Women need to come to Perth for stereotactic core biopsies and this will increase the number of procedures inside the program. 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.

TABLE 16. ASSESSMENT PROCEDURES YIELDING A DEFINITIVE DIAGNOSIS BY FUNDING, JULY 1998 TO JUNE 1999

Procedure	Assessments within Program		Assessments outside Program		All assessments	
	No. screens	%	No. screens	%	No. screens	%
CLINICAL EXAMINATION (CE)						
+/- FV						
First screens	11		5		16	
Subsequent screens	27		10		37	
Sub-total	38	4.1%	15	2.3%	53	3.3%
ULTRASOUND (US)						
+/- FV, CE						
First screens	79		104		183	
Subsequent screens	147		164		311	
Sub-total	226	24.5%	268	40.2%	494	31.1%
FINE NEEDLE ASPIRATION (FNA)						
+/- FV, CE, US, OM						
First screens	87		82		169	
Subsequent screens	142		132		274	
Sub-total	229	24.8%	214	32.1%	443	27.9%
CORE BIOPSY (CB)						
+/- FV, CE, US, OM, FNA						
First screens	118		23		141	
Subsequent screens	215		47		262	
Sub-total	333	36.0%	70	10.5%	403	25.3%
DIAGNOSTIC OPEN BIOSY (DOB)						
+/- any of the above procedures						
First screens	31		28		59	
Subsequent screens	67		71		138	
Sub-total	98	10.6%	99	14.9%	197	12.4%
TOTAL PROCEDURES						
First screens	326		242		568	
Subsequent screens	598		424		1,022	
TOTAL	924	100%	666	100%	1,590	100%

Source: BreastScreen WA, Mammography Screening Registry

RECOMMENDATION AFTER ASSESSMENT

Table 17 lists the recommendations after all assessment procedures up to any needle biopsy, but prior to any surgical biopsy or early review visit. The outcome of assessment may be a return to routine screening, a recommendation for definitive treatment for breast cancer or, in the case of an equivocal lesion, a diagnostic open biopsy or early review. A return to normal screening is usually a return in two years, but may be a return at one year if the woman has a family or personal history of breast cancer.

Of the 3,489 women who were assessed, 2,853 (82%) had a normal or benign outcome without the need for surgical biopsy. Diagnostic open biopsy was recommended for 185 women, representing 5% of all women assessed or 0.3% of the 58,811 women screened. This figure is consistent with the outcomes of the previous year and well within the National Accreditation Requirement that less than 2% of women screened be referred for open biopsy.

Seven percent (242) of the women assessed had a diagnosis of cancer without the need for diagnostic open biopsy. The next stage of their management involved treatment, usually by surgery such as a local excision or mastectomy often in conjunction with adjuvant therapy. Details of their treatment are listed in the section on management of breast cancer in this Report (from page 36).

An early review recommendation involves a return in six month's time for further assessment. 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. Some women may be recalled for early review if they are found to have an asymmetric density considered likely to be normal tissue, which is not visible on ultrasound, or missed calcifications where the woman declines further biopsy. In 1998/99, 202 women, or 6% of the women assessed, were asked to return for early review.

TABLE 17. RECOMMENDATION AFTER ASSESSMENT BY ROUND BY AGE GROUP, JULY 1998 TO JUNE 1999

Recommendation	Age group						50-69		All ages	
	<40	40-49	50-59	60-69	70-79	80+	screens	%	screens	%
FIRST SCREENS										
Definitive Treatment for Cancer	0	17	25	9	6	0	34	6.5%	57	4.6%
Diagnostic Open Biopsy	0	23	21	5	4	0	26	5.0%	53	4.3%
Early Review	0	41	31	15	2	2	46	8.8%	91	7.4%
Other	0	3	1	0	0	0	1	0.2%	4	0.3%
Return to routine screening	3	562	318	98	37	5	416	79.5%	1,023	83.3%
Sub-total	3	646	396	127	49	7	523	100%	1,228	100%
SUBSEQUENT SCREENS										
Definitive Treatment for Cancer	0	18	77	72	18	0	149	8.4%	185	8.2%
Diagnostic Open Biopsy	0	22	61	45	3	1	106	6.0%	132	5.8%
Early Review	0	20	46	38	7	0	84	4.7%	111	4.9%
Other	0	2	0	1	0	0	1	0.1%	3	0.1%
Return to routine screening	0	320	905	528	75	2	1,433	80.8%	1,830	80.9%
Sub-total	0	382	1,089	684	103	3	1,773	100%	2,261	100%
ALL SCREENS										
Definitive Treatment for Cancer	0	35	102	81	24	0	183	8.0%	242	6.9%
Diagnostic Open Biopsy	0	45	82	50	7	1	132	5.7%	185	5.3%
Early Review	0	61	77	53	9	2	130	5.7%	202	5.8%
Other	0	5	1	1	0	0	2	0.1%	7	0.2%
Return to routine screening	3	882	1,223	626	112	7	1,849	80.5%	2,853	81.8%
TOTAL	3	1,028	1,485	811	152	10	2,296	100%	3,489	100%

Source: BreastScreen WA, Mammography Screening Registry



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 18 classifies the recommendations after assessment into program-funded 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 1,899 women who returned to routine screening after further views have been excluded as their numbers would have heavily biased the 'assessment within program' totals.

The rate of pre-surgical decisions for definitive treatment for cancer (18%) and the rate of recommendations for diagnostic open biopsy (11%) was higher in program-funded assessments than for assessments outside the program (each approximately 3%, respectively). Non-program assessments showed a higher rate of recommendations for return to normal screening – 88% vs. 66% for assessments within the program.

TABLE 18. RECOMMENDATION AFTER ASSESSMENT BY FUNDING, JULY 1998 TO JUNE 1999

Recommendation	Assessment within Program			Assessment outside Program			All recommendations		
	50-69	All ages	%	50-69	All ages	%	50-69	All ages	%
FIRST SCREENS									
Definitive Treatment for Cancer	23	37	11.2%	11	20	2.2%	34	57	4.6%
Diagnostic Open Biopsy	18	32	9.7%	8	21	2.3%	26	53	4.3%
Early Review	17	28	8.5%	29	63	7.0%	46	91	7.4%
Other	0	1	0.3%	1	3	0.3%	1	4	0.3%
Return to routine screening	86	232	70.3%	330	791	88.1%	416	1,023	83.3%
Sub-total	144	330	100%	379	898	100%	523	1,228	100%
SUBSEQUENT SCREENS									
Definitive Treatment for Cancer	106	130	21.4%	43	55	3.3%	149	185	8.2%
Diagnostic Open Biopsy	55	72	11.8%	51	60	3.6%	106	132	5.8%
Early Review	17	21	3.5%	67	90	5.4%	84	111	4.9%
Other	0	1	0.2%	1	2	0.1%	1	3	0.1%
Return to routine screening	301	384	63.2%	1,132	1,446	87.5%	1,433	1,830	80.9%
Sub-total	479	608	100%	1,294	1,653	100%	1,773	2,261	100%
ALL SCREENS									
Definitive Treatment for Cancer	129	167	17.8%	54	75	2.9%	183	242	6.9%
Diagnostic Open Biopsy	73	104	11.1%	59	81	3.2%	132	185	5.3%
Early Review	34	49	5.2%	96	153	6.0%	130	202	5.8%
Other	0	2	0.2%	2	5	0.2%	2	7	0.2%
Return to routine screening	387	616	65.7%	1,462	2,237	87.7%	1,849	2,853	81.8%
TOTAL	623	938	100%	1,673	2,551	100%	2,296	3,489	100%

Source: BreastScreen WA, Mammography Screening Registry

DEFINITIVE DIAGNOSIS

Of the 3,489 women who underwent assessment for a suspicious mammographic abnormality, 3,140 (90%) women were given a benign diagnosis, while 328 (9%) had a diagnosis of cancer. This outcome is similar to that of 1997/98 (91% and 8%, respectively). A total of 21 (1%) women declined to complete their assessment.

Only further mammographic views were required to diagnose a benign outcome in 60% (1,899) of women assessed whilst 40% (1,251) required ultrasound or biopsy to reach a diagnosis. Whilst a higher proportion of subsequent screens were diagnosed benign after further views alone, the differences between rounds were not great and were similar to the outcomes in 1997/98.

One of the 328 cancers counted in Table 19 was detected at early review and is thus considered an interval cancer. The characteristics of this interval cancer are not included from Table 20 onward.

TABLE 19. OUTCOME OF ASSESSMENT BY ROUND, JULY 1998 TO JUNE 1999

Outcome	First screens			Subsequent screens			Total		
	No. assessments	% of outcome	% of total	No. assessments	% of outcome	% of total	No. assessments	% of outcome	% of total
BENIGN OUTCOMES									
After further views	654	57%		1,235	62%		1,889	60%	
After further assessment	491	43%		760	38%		1,251	40%	
Total	1,145	100%	93.2%	1,995	100%	88.2%	3,140	100%	90.0%
MALIGNANT OUTCOMES									
Malignant – breast	73	100%		253	99%		326	99%	
Malignant – other	0	0.0%		2	0.8%		2	0.6%	
Total	73	100%	5.9%	255	100%	11.3%	328	100%	9.4%
INCOMPLETE / UNKNOWN	10		0.8%	11		0.5%	21		0.6%
TOTAL OUTCOMES	1,228		100%	2,261		100%	3,489		100%

Source: BreastScreen WA, Mammography Screening Registry



METHOD OF PATHOLOGICAL DIAGNOSIS

Table 20 lists the procedures that yielded the definitive pathological diagnosis of breast cancer. Analysis of the fine needle aspirate produced the most diagnoses (57%), followed by diagnostic open biopsy (24%) and core biopsy (19%).

The ranking of procedures detecting the cancers remains the same as in previous years. However, compared with 1997/98 the proportion of fine needle aspirations fell 6% while diagnostic open biopsy and core biopsy increased 4% and 3%, respectively (Figure 6).

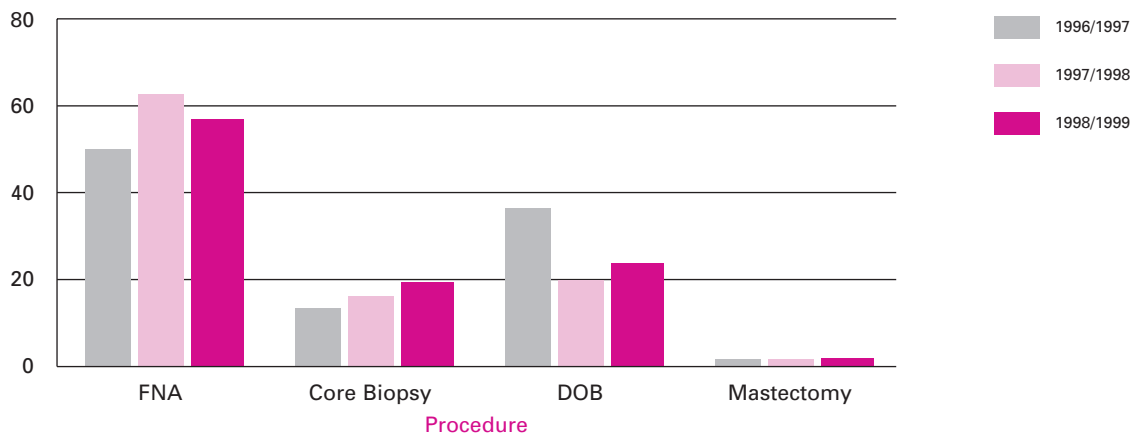
TABLE 20. PROCEDURE YIELDING THE DEFINITIVE PATHOLOGICAL DIAGNOSIS OF BREAST CANCER BY ROUND, JULY 1998 TO JUNE 1999

Procedure	First screens		Subsequent screens		All screens	
	No. cancers	%	No. cancers	%	No. cancers	%
Fine needle aspiration	47	65.3%	138	54.5%	185	56.9%
Core biopsy	12	16.7%	50	19.8%	62	19.1%
Diagnostic open biopsy	13	18.1%	64	25.3%	77	23.7%
Mastectomy	0	0.0%	1	0.4%	1	0.3%
Other	0	0.0%	0	0.0%	0	0.0%
TOTAL BREAST CANCERS	72	100%	253	100%	325	100%

Source: BreastScreen WA, Mammography Screening Registry

FIGURE 6. METHOD OF PATHOLOGICAL DIAGNOSIS, 1996/97 TO 1998/99

Percentage of cancers detected



Source: BreastScreen WA, Mammography Screening Registry

Table 21 and Figure 7 compare the procedures that yielded a pathological diagnosis of breast cancer within and outside the program. The 'outside the program' category includes women who had no program-funded assessment visits other than any diagnostic further mammographic views, which are always program-funded.

Sixty three percent (206) of breast cancers in 1998/99 were diagnosed within the program. The proportion of cancers diagnosed by fine needle aspiration decreased from 72% in 1997/98 to 61% in 1998/99 for cases funded by the program, while for non-funded assessments the rate remained at 50%. The use of open biopsy to achieve a definitive diagnosis increased for in-program assessments (from 10% in 1997/98 to 17% in 1998/99) while it remained relatively unchanged for assessments performed privately (34% vs. 35%, respectively).

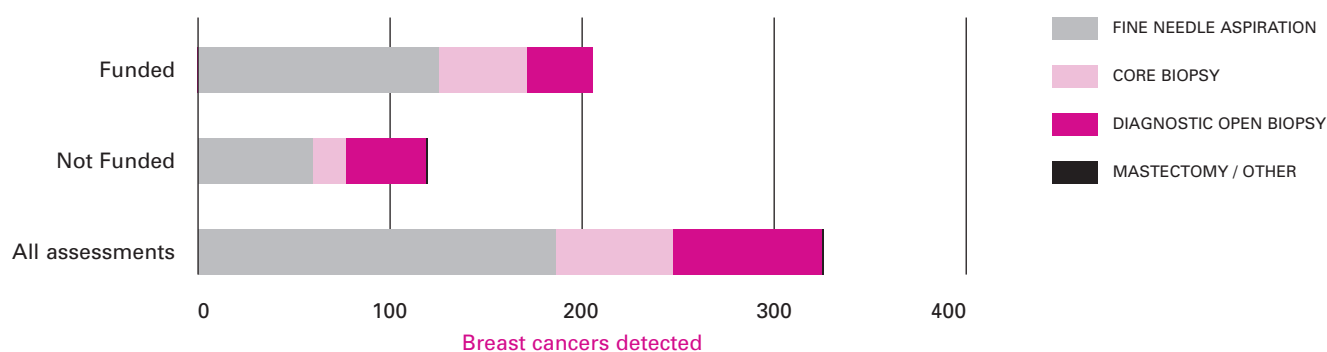
TABLE 21. PROCEDURE YIELDING THE PATHOLOGICAL DIAGNOSIS OF BREAST CANCER BY FUNDING, JULY 1998 TO JUNE 1999

Procedure	Assessment within Program		Assessment outside Program		All assessments	
	No. cancers	%	No. cancers	%	No. cancers	%
Fine needle aspiration	125	60.7%	60	50.4%	185	56.9%
Core biopsy	46	22.3%	16	13.4%	62	19.1%
Diagnostic open biopsy	35	17.0%	42	35.3%	77	23.7%
Mastectomy	0	0.0%	1	0.8%	1	0.3%
Other	0	0.0%	0	0.0%	0	0.0%
TOTAL BREAST CANCERS	206	100%	119	100%	325	100%

Source: BreastScreen WA, Mammography Screening Registry

FIGURE 7. HISTOLOGICAL METHOD OF DIAGNOSIS OF BREAST CANCER BY FUNDING, JULY 1998 TO JUNE 1999

Funding of assessment leading to diagnosis



Source: BreastScreen WA, Mammography Screening Registry



BENIGN TO MALIGNANT OPEN BIOPSY RATIO

The benign:malignant open biopsy ratio expresses the number of benign results compared to all malignancies detected in the period. The need for a surgical procedure to detect a breast cancer has declined as experience with needle biopsy techniques has grown, and the latter has become the primary biopsy tool for breast cancer detection. Cases where the presence of cancer cannot be ruled out on core or fine needle biopsy are recommended for diagnostic open biopsy. As a result, the number of benign outcomes of the procedure should be low with a correspondingly low benign:malignant ratio. The National Accreditation Requirements specify that the benign:malignant ratio should be less than 2:1 for first screening rounds and less than 1:1 for subsequent rounds.

Table 22 summarises the results for all women who underwent a diagnostic surgical procedure. The BreastScreen WA service comfortably met the national benign:malignant standards with ratios of 0.6:1 for first screens and 0.3:1 for subsequent screens across all age groups.

The data in Table 22 excludes the one interval cancer and counts only once the woman who had two diagnostic open biopsies.

TABLE 22. OUTCOMES OF DIAGNOSTIC OPEN BIOPSY (DOB) PROCEDURES BY ROUND BY AGE GROUP, JULY 1998 TO JUNE 1999

Outcome of diagnostic open biopsy	Age group													
	40-49		50-59		60-69		70-79		80+		50-69		Total	
	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%
BENIGN OUTCOMES (A)														
First screens	18		17		4		4		0		21		43	
Subsequent screens	17		30		20		2		0		50		69	
Sub-total	35	71.4%	47	54.7%	24	48.0%	6	66.7%	0	0%	71	52.2%	112	57.4%
MALIGNANT OUTCOMES														
First screens	6		6		1		1		0		7		14	
Subsequent screens	8		33		25		2		1		58		69	
Sub-total	14	28.6%	39	45.3%	26	52.0%	3	33.3%	1	100%	65	47.8%	83	42.6%
TOTAL DOBs PERFORMED														
First screens	24		23		5		5		0		28		57	
Subsequent screens	25		63		45		4		1		108		138	
TOTAL	49	100%	86	100%	50	100%	9	100%	1	100%	136	100%	195	100%
ALL CANCERS DETECTED (B)														
First screens	23		33		10		6		0		43		72	
Subsequent screens	27		110		97		20		1		207		255	
TOTAL	50		143		107		26		1		250		327	
BENIGN DOB:ALL MALIGNANCIES (A:B)														
First screens	0.8:1		0.5:1		0.4:1		0.7:1		n/a		0.5:1		0.6:1	
Subsequent screens	0.7:1		0.3:1		0.2:1		0.1:1		n/a		0.2:1		0.3:1	
All screens	0.7:1		0.3:1		0.2:1		0.3:1		n/a		0.3:1		0.3:1	

Source: BreastScreen WA, Mammography Screening Registry

Table 23 compares the outcome of diagnostic open biopsies within and outside the program. The benign:malignant ratio for non-funded assessments has improved from 0.6:1 in 1997/98 to 0.4:1 in 1998/99 and remains only marginally higher than the ratio for program-funded assessments.

TABLE 23. OUTCOMES OF DIAGNOSTIC OPEN BIOPSY (DOB) PROCEDURES BY ROUND BY FUNDING, JULY 1998 TO JUNE 1999

Outcomes of Diagnostic Open Biopsy	Assessment within Program				Assessment outside Program				All biopsies			
	50-69		All ages		50-69		All ages		50-69		All ages	
	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%
BENIGN OUTCOMES (A)												
First screens	13		26		8		17		21		43	
Subsequent screens	31		44		19		25		50		69	
Sub-total	44	61.1%	70	64.2%	27	42.2%	42	48.8%	71	52.2%	112	57.4%
MALIGNANT OUTCOMES												
First screens	5		8		2		6		7		14	
Subsequent screens	23		31		35		38		58		69	
Sub-total	28	38.9%	39	35.8%	37	57.8%	44	51.2%	65	47.8%	83	42.6%
TOTAL DOBs PERFORMED												
First screens	18		34		10		23		28		57	
Subsequent screens	54		75		54		63		108		138	
TOTAL	72	100%	109	100%	64	100%	86	100%	136	100%	195	100%
ALL CANCERS DETECTED (B)												
First screens			47				25				72	
Subsequent screens			161				94				255	
TOTAL			208				119				327	
BENIGN DOB:ALL MALIGNANCIES (A:B)												
First screens			0.6:1				0.7:1				0.6:1	
Subsequent screens			0.3:1				0.3:1				0.3:1	
All screens			0.3:1				0.4:1				0.4:1	

Source: BreastScreen WA, Mammography Screening Registry

Breast Cancer Detection



DETECTION RATES

Table 24 and Figure 8 display the numbers of breast cancers detected in the BreastScreen WA program in 1998/99 by age group and the status of any family history of breast cancer, respectively. The data include all breast cancers, whether invasive or ductal carcinoma *in situ* (DCIS) but do not include the interval cancer detected at early review. No cancers were detected in women under the age of 40 years. Of the 325 breast cancers detected, 79% (256) were classified as invasive and 21% (69) as DCIS.

The cancer detection rate for all breast cancers in the 50-69 year age group was 248 cancers detected from 43,378 screens, or 57 per 10,000 screens. For women with a family history of breast cancer, detection rates for first and subsequent screens were 1.7 times and 1.2 times higher, respectively, than rates in women without a family history of breast cancer (Figure 8).

The National Accreditation Requirements state that at least 50 and 20 cancers per 10,000 screens should be detected in first and subsequent rounds, respectively. BreastScreen WA meets this requirement with 61 and 54 cancers detected per 10,000 first and subsequent screens, respectively.

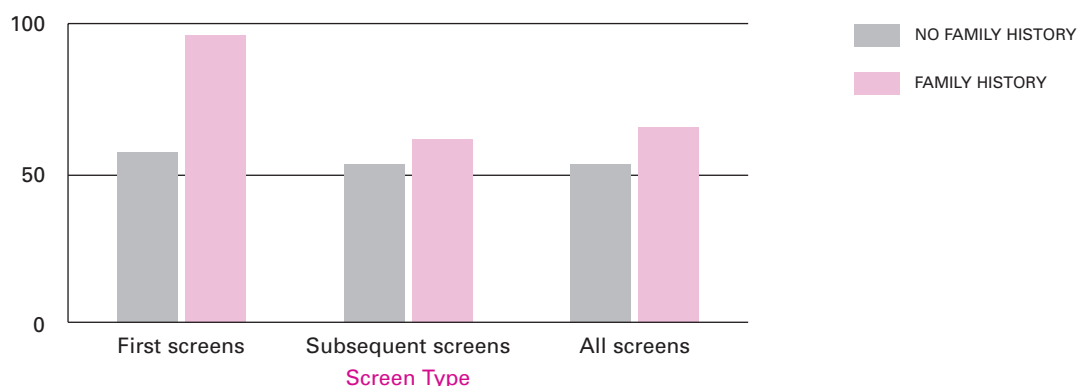
TABLE 24. BREAST CANCER DETECTION RATE BY ROUND BY AGE GROUP, JULY 1998 TO JUNE 1999

Type of cancer	Age group													
	40-49		50-59		60-69		70-79		80+		50-69		All ages	
	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%	No. DOBs	%
INVASIVE CANCERS														
First screens	17		24		10		6		0		34		57	
Subsequent screens	17		83		80		18		1		163		199	
Sub-total	34	68.0%	107	75.9%	90	84.1%	24	92.3%	1	100.0%	197	79.4%	256	78.8%
DCIS														
First screens	6		9		0		0		0		9		15	
Subsequent screens	10		25		17		2		0		42		54	
Sub-total	16	32.0%	34	24.1%	17	15.9%	2	7.7%	0	0.0%	51	20.6%	69	21.2%
ALL BREAST CANCERS														
First screens	23		33		10		6		0		43		72	
Subsequent screens	27		108		97		20		1		205		253	
TOTAL	50	100%	141	100%	107	100%	26	100%	1	100%	248	100%	325	100%
RATE PER 10,000 SCREENS														
First screens	40.1		84.8		66.4		93.5		0.0		79.7		60.6	
Subsequent screens	42.9		49.8		59.4		80.1		63.7		54.0		53.9	
All screens	41.6		55.2		60.0		82.8		43.1		57.2		55.3	

Source: BreastScreen WA, Mammography Screening Registry

FIGURE 8. BREAST CANCER DETECTION RATES BY FAMILY HISTORY STATUS, JULY 1998 TO JUNE 1999

Rate per
10,000 screens



Source: BreastScreen WA, Mammography Screening Registry

HISTOLOGIC TYPE OF BREAST CANCERS

Table 25 lists the 256 invasive and 69 *in situ* breast cancers by histological type. Also included are the two cancers classified as either non-breast or secondary malignancies.

For both first and subsequent 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. These proportions are similar to those found in 1997/98.

TABLE 25. NUMBER OF CANCERS DETECTED BY HISTOLOGY BY ROUND, JULY 1998 TO JUNE 1999

Type of cancer	First screens		Subsequent screens		All screens	
	No. cancers	%	No. cancers	%	No. cancers	%
INVASIVE CANCERS						
Invasive Ductal not otherwise specified	45	78.9%	144	72.4%	189	73.8%
Tubular	1	1.8%	15	7.5%	16	6.3%
Cribriform	0	0.0%	0	0.0%	0	0.0%
Mucinous (Colloid)	0	0.0%	1	0.5%	1	0.4%
Medullary	1	1.8%	1	0.5%	2	0.8%
Lobular Classical	4	7.0%	22	11.1%	26	10.2%
Lobular Variant	2	3.5%	3	1.5%	5	2.0%
Mixed Ductal/Lobular	4	7.0%	13	6.5%	17	6.6%
Total invasive cancers	57	100%	199	100%	256	100%
NON-INVASIVE CANCERS						
Comedo DCIS	6	40.0%	18	33.3%	24	34.8%
Non-comedo DCIS	6	40.0%	24	44.4%	30	43.5%
Mixed DCIS	2	13.3%	12	22.2%	14	20.3%
Other DCIS	1	6.7%	0	0.0%	1	1.4%
Total non-invasive cancers	15	100%	54	100%	69	100%
NON-BREAST CANCERS	0		2		2	
TOTAL CANCERS	72		255		327	

Source: BreastScreen WA, Mammography Screening Registry



CANCER SIZE AND LYMPH NODE INVOLVEMENT

Table 26 shows invasive breast cancers by size of tumour. 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 specify that Services must aim to detect at least 8 cancers of 10mm or less per 10,000 screens. Of the 256 invasive cancers detected, 98 (38%) were ≤ 10 mm in diameter. This equates to 17 cases per 10,000 screens, well above the national minimum standards.

TABLE 26. NUMBER OF INVASIVE BREAST CANCERS BY SIZE BY ROUND, JULY 1998 TO JUNE 1999

Type of cancer	First screens		Subsequent screens		All cancers	% invasive cancers	Rate per 10,000 screens
	No. cancers	%	No. cancers	%			
INVASIVE CANCERS							
≤ 10 mm	8	14.0%	90	45.2%	98	38.2%	16.7
11-15 mm	21	36.8%	51	25.6%	72	28.2%	12.2
>15 mm	28	49.1%	58	29.1%	86	33.7%	14.6
Size unknown	0	0.0%	0	0.0%	0	0.0%	
TOTAL	57	100%	199	100%	257	100%	

Source: BreastScreen WA, Mammography Screening Registry

The following table shows nodal status by size and type of tumour. Of the 216 women with invasive cancer who had axillary node excision 56 (26%) showed metastatic involvement. The larger the breast cancer, the higher the rate of metastases in the lymph nodes. Positive lymph nodes were discovered in 12% of cases where the cancer was less than 10mm and in 42% of those with cancers larger than 15mm. Both these metastatic rates are higher than in 1997/98 (8% and 36%, respectively). The percentage of all women with invasive cancers having lymph node excision was 2% higher than in 1997/98.

Thirty three percent of women with DCIS underwent axillary dissection and all cases were node negative. The rate of nodal dissection for *in situ* breast cancers was similar to that in 1997/98 (33%).

TABLE 27. LYMPH NODE REMOVAL AND METASTATIC STATUS, JULY 1998 TO JUNE 1999

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)	69	23	33.3%	0	0.0%
INVASIVE CANCERS					
<=10 mm	98	66	67.3%	8	12.1%
11-15 mm	72	65	90.3%	12	18.5%
>15 mm	86	85	98.8%	36	42.4%
Size unknown	0	0	0.0%	0	0.0%
Total invasive breast cancers	256	216	84.4%	56	25.9%
NON-BREAST CANCERS	2	0	0.0%	0	0.0%
TOTAL CANCERS	327	239	73.1%	56	23.4%

Source: BreastScreen WA, Mammography Screening Registry



GRADE OF CANCERS

Table 28 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).⁵ Grade 1 represents a well differentiated, grade 2 a moderately differentiated and grade 3 a poorly differentiated, tumour. The higher the grade, the poorer the prognosis.

The data in the table below indicate that, in general, the smaller the size of the cancer at diagnosis the lower the grade and the better the prognosis. Information on tumour grade was not available for 8 cancers.

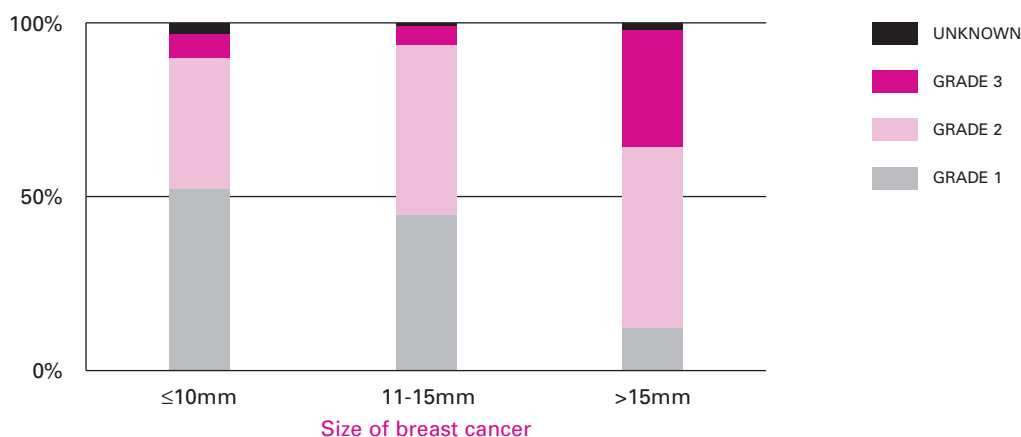
TABLE 28. NUMBER OF INVASIVE BREAST CANCERS BY HISTOLOGICAL GRADE BY SIZE, JULY 1998 TO JUNE 1999

Histological grade	Size of invasive breast cancer							
	≤10mm		11-15mm		>15mm		Total	
	No. cancers	%	No. cancers	%	No. cancers	%	No. cancers	%
Grade 1	51	52.0%	32	44.4%	13	15.1%	96	37.5%
Grade 2	34	34.7%	33	45.8%	44	51.2%	111	43.4%
Grade 3	8	8.2%	6	8.3%	27	31.4%	41	16.0%
Unknown	5	5.1%	1	1.4%	2	2.3%	8	3.1%
TOTAL BREAST CANCERS	98	100%	72	100%	86	100%	256	100%

Source: BreastScreen WA, Mammography Screening Registry

FIGURE 9. PROPORTIONS OF INVASIVE BREAST CANCERS BY HISTOLOGICAL GRADE BY SIZE, JULY 1998 TO JUNE 1999

Percentage of breast cancers detected



Source: BreastScreen WA, Mammography Screening Registry

⁵ 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

The surgical treatments undertaken to remove malignant lesions are shown in the following three Tables. Breast conserving surgery comprises those cases where the lesion was completely removed at the time of a diagnostic open biopsy and no further surgery was required, or where localised excision or lumpectomy was performed to remove a lesion already identified as malignant. Some women may have also undergone re-excision to provide greater clearance around the lesion.

TABLE 29. NUMBER OF SURGICAL PROCEDURES FOR BREAST CANCER TREATMENT BY ROUND, JULY 1998 TO JUNE 1999

Surgical procedure for treatment	First screens		Subsequent screens		All screens	
	No. procedures	%	No. procedures	%	No. procedures	%
Breast conserving surgery	38	52.8%	170	67.2%	208	64.0%
Mastectomy	33	45.8%	83	32.8%	116	35.7%
No surgery / unknown	1	1.4%	0	0.0%	1	0.3%
TOTAL BREAST CANCERS	72	100%	253	100%	325	100%

Source: BreastScreen WA, Mammography Screening Registry

The majority (64%) of malignancies, regardless of cancer type, was removed using breast conservation techniques. The remaining women elected to have a mastectomy, either as a first option or after localised excisional surgery. The proportion of women choosing mastectomy rose by 2% compared with 1997/98 and was higher in first screens than in subsequent screens (Table 29).

As in 1997/98, mastectomy was more common for *in situ* cancers than invasive cancers (Table 30). This is most likely a reflection of the fact that screen-detected *in situ* cancers are generally larger than screen-detected invasive cancers.

TABLE 30. NUMBER OF SURGICAL PROCEDURES FOR BREAST CANCER TREATMENT BY TYPE OF CANCER, JULY 1998 TO JUNE 1999

Surgical procedure for treatment	Invasive cancers		DCIS		All cancers	
	No. procedures	%	No. procedures	%	No. procedures	%
Breast conserving surgery	171	66.8%	37	53.6%	208	64.0%
Mastectomy	84	32.8%	32	46.4%	116	35.7%
No surgery / unknown	1	0.4%	0	0.0%	1	0.3%
TOTAL BREAST CANCERS	256	100%	69	100%	325	100%

Source: BreastScreen WA, Mammography Screening Registry



Table 31 shows the type of cancer treatment by place of residence for metropolitan and rural/remote areas. While breast-conserving surgery was the preferred option for the majority of women regardless of residence, a higher proportion of rural or remote women (47%) chose mastectomy compared with metropolitan women (32%). Although 28% of all breast cancers are detected in women resident outside the metropolitan area (see Figure 8), the rate of mastectomy was disproportionately higher (37% of all mastectomies) in these women compared with women living in the metropolitan area.

The rate of mastectomy in country women, as a proportion of all surgical treatments, was 15% higher than that for metropolitan women. This difference was 8% in 1995/96, 6% in 1996/97 and 10% in 1997/98.

TABLE 31. NUMBER OF SURGICAL PROCEDURES PERFORMED FOR BREAST CANCER TREATMENT BY PLACE OF RESIDENCE, JULY 1998 TO JUNE 1999

Surgical procedure for treatment	Metropolitan		Country		Total	
	No. procedures	%	No. procedures	%	No. procedures	%
Breast conserving surgery	160	68.1%	48	53.3%	208	64.0%
Mastectomy	74	31.5%	42	46.7%	116	35.7%
No surgery / unknown	1	0.4%	0	0.0%	1	0.3%
TOTAL BREAST CANCERS	235	100%	90	100%	325	100%

Source: BreastScreen WA, Mammography Screening Registry

ADJUVANT THERAPY USE

Adjuvant therapy information was available for 74% of breast cancers diagnosed and is shown in relation to cancer type in Table 32. Radiotherapy and Tamoxifen, or a combination of both, were the most common follow-up treatments for the majority of women, regardless of the nature of the breast cancer.

Of those women with invasive breast cancer, 86% received some sort of adjuvant therapy, a 3% increase on usage in 1997/98. Of those with DCIS, 25% received adjuvant therapy, a 4% decrease compared with adjuvant therapy usage in 1997/98.

TABLE 32. ADJUVANT THERAPY FOR TREATMENT OF BREAST CANCER BY TYPE OF CANCER, JULY 1998 TO JUNE 1999

Surgical procedure for treatment	Invasive		DCIS		Total	
	No. procedures	%	No. procedures	%	No. procedures	%
Chemotherapy	10	3.9%	0	0.0%	10	3.1%
Radiotherapy	45	17.6%	10	14.5%	55	16.9%
Tamoxifen	58	22.7%	5	7.2%	63	19.4%
Chemotherapy & Radiotherapy	11	4.3%	0	0.0%	11	3.4%
Chemotherapy & Tamoxifen	10	3.9%	0	0.0%	10	3.1%
Radiotherapy & Tamoxifen	76	29.7%	2	2.9%	78	24.0%
Chemotherapy & Radiotherapy & Tamoxifen	9	3.5%	0	0.0%	9	2.8%
Radiotherapy & Other	1	0.4%	0	0.0%	1	0.3%
Tamoxifen & Other	1	0.4%	0	0.0%	1	0.3%
Other	1	0.4%	2	2.9%	3	0.9%
Unknown	34	13.3%	50	72.5%	84	25.8%
TOTAL BREAST CANCERS	256	100%	69	100%	325	100%

Source: BreastScreen WA, Mammography Screening Registry



INTERVAL CANCER RATE

An interval cancer is an invasive breast cancer that is diagnosed between routine screenings, that is, after a screening mammogram that detected no abnormality and before the next screening episode.

Interval cancers are classified according to the risk status of the women. Women who are screened at one year intervals (for example, in the BreastScreen WA program those with a family history of breast cancer) 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 screened every 2 years 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. Given the above conditions, 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.

The current National Accreditation Requirements state that <6 per 10,000 women screened develop breast cancer in the 12 months following screening.

BreastScreen WA interval cancer data for screens from January to December 1997 is presented here as this information has been prepared for inclusion in the BreastScreen Australia 1998-1999 statistical report, due in late 2001, and covers much of the period of this document. The interval cancer rate for the first 12 months following a normal screen in 1997 was 6.6 per 10,000 in all women screened for the first time and 9.4 per 10,000 screens for women who had a subsequent screen. The corresponding rates for women in the target age group were 6.2 and 4.5, respectively. Table 33 shows the interval cancers detected in the first 12 months and between 13 and 24 months after a normal 1997 screen, by age group and screening round.

TABLE 33. INTERVAL CANCER RATES FOR 1997 SCREENS BY ROUND BY AGE GROUP

Screen type and time since last screen	Age Group					Total
	40-49	50-59	60-69	70+	50-69	
FIRST SCREENS						
Cancers detected between 0-12 months						
Number of interval cancers	6	5	2	0	7	13
Number of women years at risk	6,893	7,685	3,664	1,407	11,349	19,691
Interval Cancer Rate	8.7	6.5	5.5	0.0	6.2	6.6
Cancers detected between 13-24 months						
Number of interval cancers	6	8	3	2	11	19
Number of women years at risk	6,194	7,015	3,305	1,251	10,320	17,773
Interval Cancer Rate	9.7	11.4	9.1	16.0	10.7	10.7
SUBSEQUENT SCREENS						
Cancers detected between 0-12 months						
Number of interval cancers	3	19	12	2	14	36
Number of women years at risk	5,615	17,294	13,512	1,974	30,806	38,415
Interval Cancer Rate	5.3	11.0	8.9	10.1	4.5	9.4
Cancers detected between 13-24 months						
Number of interval cancers	2	11	10	0	25	28
Number of women years at risk	4,399	14,511	11,174	1,585	25,685	31,673
Interval Cancer Rate	4.5	7.6	8.9	0.0	9.7	8.8

Source: BreastScreen WA, Mammography Screening Registry and Western Australian Cancer Registry

BreastScreen

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 standards using the information presented in this Report.⁶

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 1998 was 53%.
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 1998 was 44% and 100%, 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.	73% of women aged 50-69 screened in 1996/97 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.	10% 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.	0.3% of women screened were referred for open diagnostic biopsy.
2.19	To minimise unnecessary invasive procedures (that is, surgical biopsies for histology on benign cases).	Benign:Malignant biopsy ratio of: ≤ 2:1 for prevalent round ≤ 1:1 in incident rounds	0.6:1 for first and 0.3:1 for subsequent rounds.
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.	61 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.	17 invasive breast cancers less than 10mm were detected per 10,000 screens.
2.25	To detect a representative proportion of ductal carcinoma <i>in situ</i> (DCIS) at the prevalent screening round.	10-20% of cancers detected will be DCIS.	21% of all cancers detected were DCIS types.
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 ⁷) in the 12 months following screening.	In the period 0 – 12 months following a screen, the interval cancer rate was 6.6 per 10,000 first screens and 9.4 per 10,000 subsequent screens.

⁶ Although the National Accreditation Requirements refer to screens as 'prevalent' and 'incident', data throughout this Report uses the terminology 'first' and 'subsequent' instead.

⁷ LCIS refers to Lobular Carcinoma *in situ*.

