

BreastScreen Victoria
2001
Annual Statistical Report

incorporating
BreastScreen Victoria Research
and Evaluation Annual Report



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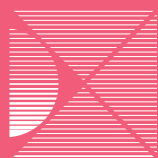
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BreastScreen Victoria provides a free mammography screening service
to women without breast symptoms aged 50 and over.
To arrange a free appointment phone 13 20 50.

September 2003



BreastScreen
VICTORIA

BreastScreen
AUSTRALIA
A joint Commonwealth/State and Territory Program



State Government
Victoria
Department of
Human Services

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BreastScreen
VICTORIA

BreastScreen Victoria

Victorian Breast Cancer Screening Program

The BreastScreen Victoria Program provides free mammography to asymptomatic women through an organised screening service that incorporates recruitment and recall for screening every two years. BreastScreen's primary aims are to reduce morbidity and mortality associated with breast cancer through early detection.

BreastScreen Victoria is a joint initiative of the Victorian and Commonwealth Governments and is part of BreastScreen Australia. Victoria is serviced by a network of eight assessment centres, around forty screening centres, a mobile van and a relocatable unit. A system of accreditation is in place whereby each service is regularly assessed by an independent team to ensure that national accreditation standards are met.

BreastScreen Victoria focuses its Program on women aged 50–69 years, the age group in whom studies have demonstrated a benefit. Women and their nominated general practitioners are notified of their screening results within two weeks.

Where an abnormality is found on screening, or where a woman reports a suspicious symptom at the screening visit, referral for specialist medical assessment at a BreastScreen Victoria centre provides free assessment to the point of definite diagnosis.

While a doctor's referral is not required to attend the service, BreastScreen Victoria liaises closely with general practitioners.

For further details, refer to the BreastScreen Victoria website at www.breastscreen.org.au.

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BreastScreen Victoria 2001 highlights

Attendance

In 2001, more than 188,000 women attended the BreastScreen Victoria Program. Of these, 77% were in the 50–69 year target age group.

Of all Victorian women aged 50–69 years, 60% participated in the BreastScreen Program during the two-year period 1 January 2000 to 31 December 2001.

The participation rate for women aged 50–69 years who usually speak a language other than English at home was 57% for the period 1 January 2000 to 31 December 2001.

Of women aged 50–69 years who were screened in 1999, 83% returned for rescreening within 27 months.

Assessment procedures

Of the women aged 50–69 years who were recommended for further assessment, 75% received a definitive outcome after further x-rays, ultrasound or clinical examination only. Of those women aged 50–69 years for whom a biopsy was required, the majority (85%) underwent a fine needle or core biopsy rather than an open surgical biopsy.

Ninety-one per cent of women diagnosed with breast cancer¹ received their definitive diagnosis without requiring an open biopsy.

Cancer detection

There were 1,064 screen-detected breast cancers diagnosed within the BreastScreen Victoria Program in 2001: 844 invasive and 220 ductal carcinoma in situ (DCIS). Of these, 74% were in women aged 50–69 years.

Of invasive cancers diagnosed, 62% were 15 mm or less in size, 33% were classified as Grade 1 and 77% were node negative.

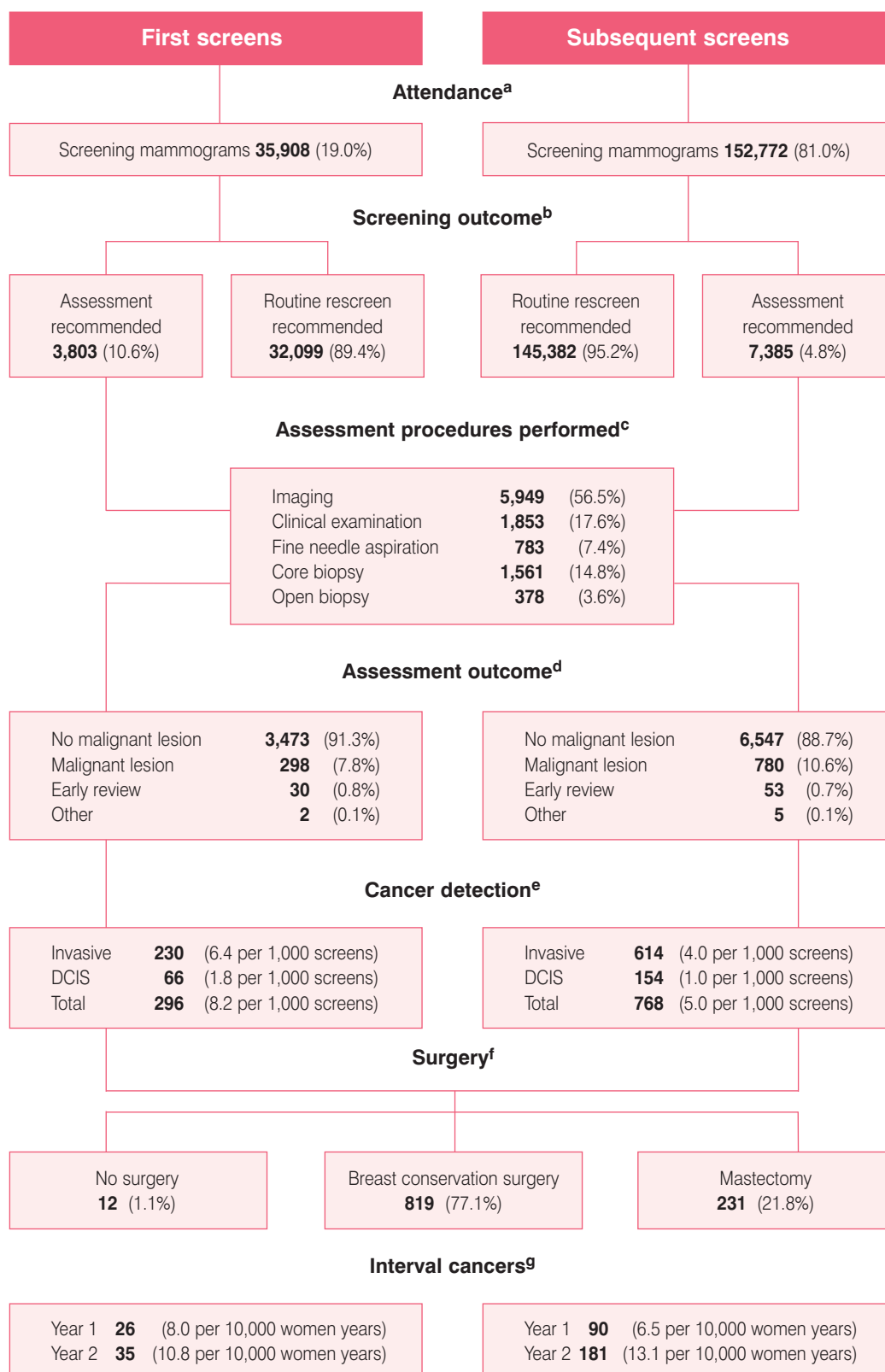
Cancer treatment

Seventy-six per cent of women with invasive breast cancer and 83% of women with DCIS were treated by breast conservation surgery.

Thirty-two per cent of women diagnosed with breast cancer and who were living in rural areas underwent mastectomy, compared with 18% of women living in urban areas.

Ninety-five per cent of women diagnosed with invasive breast cancer and 50% of women diagnosed with DCIS received some form of adjuvant therapy.

Table 1: Summary of outcomes of breast cancer screening in 2001²



SOURCE: ^a Table 2, ^b Table 19, ^c Table 20, ^d Table 21, ^e Table 30, ^f Table 36, ^g Tables 33, 34

² The source tables used may exclude data for a small number of women. Details are provided in footnotes to the table/s.

Introduction

This Annual Statistical Report provides information about BreastScreen Victoria, the Victorian component of BreastScreen Australia, the national breast cancer screening program. It provides summary data on women who attended for screening in the Victorian Program during 2001³ and the results of their screening. In addition, interval cancer and rescreen data are presented for women screened in 1999. Participation data refers to the period 1 January 2000 to 31 December 2001.

Statistical reports are produced annually and present comparable data so that time trends can be readily identified. Where appropriate, limitations of the data in this report are described. More detailed information about the structure and processes of BreastScreen Victoria can be found in its Annual Reports.

Reference to national accreditation standards, where appropriate, is also included. In recent years a review process has been undertaken culminating in the implementation of a new set of standards in July 2002.⁴ For the data presented in this report for women screened in 2001, the previous standards apply.⁵ A summary of BreastScreen Victoria's performance against selected standards is given in the Appendix.

In some sections of this report, the numbers presented are quite small; it is important to recognise the limitations in terms of interpretation of results and comparison of trends over time. Simple descriptive statistics are provided as a 'snapshot' of the BreastScreen Victoria Program.

BreastScreen Victoria is committed to the promotion of high quality research that contributes to the effectiveness and quality of service within the BreastScreen Program and to reductions in morbidity and mortality associated with breast cancer. For the first time, the Annual Statistical Report incorporates the Research and Evaluation Annual Report. This latter report provides a summary of studies endorsed by the BreastScreen Victoria Research and Evaluation Committee and the findings of those studies.

Very sincere thanks are extended to all staff of BreastScreen Victoria without whom the production of this report would not have been possible. BreastScreen Victoria particularly thanks Ms Genevieve Chappell, Manager, Registry and Information Services; Information Manager Ms Suzen Maljevac; and Consultant Epidemiologist Dr Anne Kavanagh for their expert advice and assistance.

This is the Program's eighth Annual Statistical Report.

³ All data in this Statistical Report exclude three women who attended for screening in 2001 but who were aged less than 40 years.

⁴ BreastScreen Australia (2002), *National Accreditation Standards*, Canberra: Commonwealth Department of Health and Aged Care.

⁵ National Program for the Early Detection of Breast Cancer (1994), *National Accreditation Requirements – March 1994*, Canberra: Commonwealth Department of Human Services and Health.

Attendance

Most of the information in the following eight tables comes from a questionnaire that each woman completes before her mammography examination.

Type of attendance

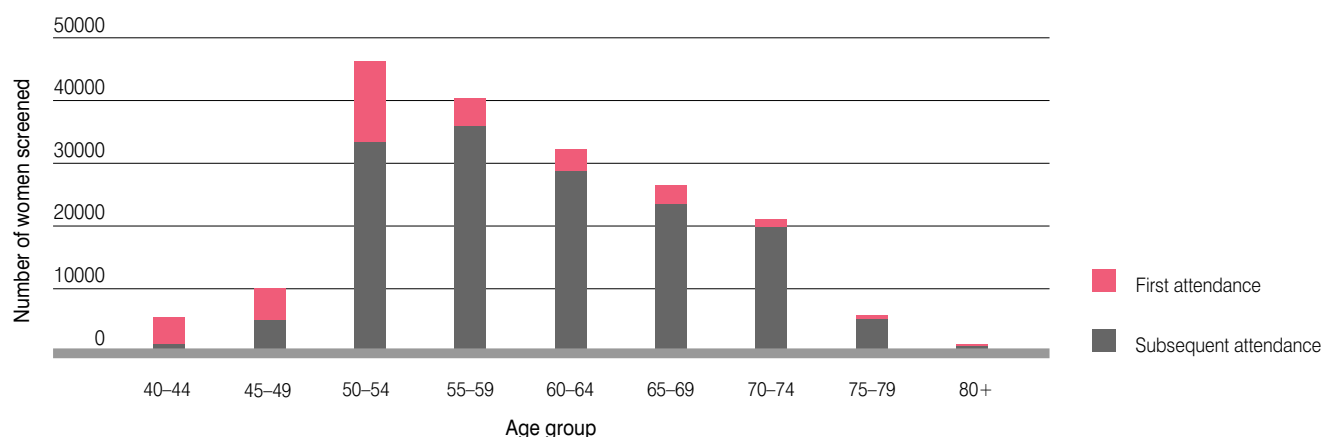
Table 2 shows the type of attendance by age group for women who were screened during 2001. Classification of attendance status is based on attendance within BreastScreen Victoria; it is acknowledged that first attenders to BreastScreen may have had previous mammography outside of the Victorian Program.

BreastScreen screened more than 188,000 women during 2001. The proportion of attendances accounted for by women who have previously attended BreastScreen Victoria is similar to last year. During 2001, 81.0% of all attendances were subsequent attendances compared with 82.1% in 2000. Among women aged 50–69 years, 83.3% of attendances were subsequent attendances in 2001, compared with 85.2% in 2000.

Table 2: Attendance by age and round⁶

Type of attendance	Age group									50–69	Total
	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80+		
First attendance	4386 80.8%	5218 51.8%	13059 28.2%	4533 11.2%	3660 11.3%	2978 11.3%	1216 5.8%	553 9.8%	305 27.9%	24230 16.7%	35908 19.0%
Subsequent attendance	1043 19.2%	4864 48.2%	33227 71.8%	35834 88.8%	28666 88.7%	23453 88.7%	19791 94.2%	5104 90.2%	790 72.1%	121180 83.3%	152772 81.0%
Total	5429 100%	10082 100%	46286 100%	40367 100%	32326 100%	26431 100%	21007 100%	5657 100%	1095 100%	145410 100%	188680 100%

Figure 1: Number of women screened by age and type of attendance



⁶ In all tables, percentages may not add to 100% due to rounding.

Area of residence

The geographic distribution of women screened in 2001 was similar to previous years and matches the profile for all Victorian women closely. Of all Victorian women screened, 73% lived in urban areas⁷ and 27% lived in rural areas.⁸ Based on the 2001 Census, 74% of the female population in Victoria aged 40 years or more lived in urban areas and 26% lived in rural areas.

Country of birth

Table 3 shows the country of birth by age group for the women who attended for screening in 2001. In the 2001 Census, 62% of the female population of Victoria aged 40 years or more were identified as having been born in Australia. Participation rates by country of birth are presented in the following section of this report.

Table 3: Attendance by age and country of birth

Country of birth	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Australia	10687 68.9%	54081 62.4%	35450 60.3%	18583 69.7%	861 78.6%	89531 61.6%	119662 63.4%
United Kingdom	969 6.2%	7574 8.7%	5213 8.9%	2106 7.9%	88 8.0%	12787 8.8%	15950 8.5%
Italy	312 2.0%	3765 4.3%	4414 7.5%	1584 5.9%	23 2.1%	8179 5.6%	10098 5.4%
Greece	197 1.3%	3152 3.6%	2900 4.9%	525 2.0%	4 0.4%	6052 4.2%	6778 3.6%
The former Yugoslavia	255 1.6%	1998 2.3%	1639 2.8%	320 1.2%	1 0.1%	3637 2.5%	4213 2.2%
Germany	62 0.4%	1382 1.6%	888 1.5%	499 1.9%	9 0.8%	2270 1.6%	2840 1.5%
Netherlands	110 0.7%	1265 1.5%	840 1.4%	378 1.4%	13 1.2%	2105 1.4%	2606 1.4%
Malta	162 1.0%	1338 1.5%	737 1.3%	187 0.7%	3 0.3%	2075 1.4%	2427 1.3%
Vietnam	463 3.0%	1004 1.2%	454 0.8%	119 0.4%	2 0.2%	1458 1.0%	2042 1.1%
New Zealand	234 1.5%	876 1.0%	298 0.5%	98 0.4%	7 0.6%	1174 0.8%	1513 0.8%
Poland	100 0.6%	514 0.6%	405 0.7%	311 1.2%	18 1.6%	919 0.6%	1348 0.7%
China	153 1.0%	565 0.7%	461 0.8%	128 0.5%	5 0.5%	1026 0.7%	1312 0.7%

⁷ References to 'urban' include capital city and other major urban according to the 'Rural/Remote Areas Classification' of the Commonwealth Department of Health and Family Services, January 1994.

⁸ References to 'rural' include rural major, rural other, remote major and remote other according to the 'Rural/Remote Areas Classification' of the Commonwealth Department of Health and Family Services, January 1994.

Sri Lanka	121 0.8%	576 0.7%	302 0.5%	125 0.5%	3 0.3%	878 0.6%	1127 0.6%
Malaysia	164 1.1%	658 0.8%	218 0.4%	57 0.2%	1 0.1%	876 0.6%	1098 0.6%
India	94 0.6%	537 0.6%	329 0.6%	112 0.4%	5 0.5%	866 0.6%	1077 0.6%
Egypt	51 0.3%	459 0.5%	349 0.6%	123 0.5%	4 0.4%	808 0.6%	986 0.5%
Philippines	139 0.9%	572 0.7%	152 0.3%	39 0.1%	0 0.0%	724 0.5%	902 0.5%
Cyprus	48 0.3%	424 0.5%	260 0.4%	75 0.3%	0 0.0%	684 0.5%	807 0.4%
Turkey	90 0.6%	436 0.5%	163 0.3%	34 0.1%	0 0.0%	599 0.4%	723 0.4%
South Africa	79 0.5%	402 0.5%	156 0.3%	66 0.2%	3 0.3%	558 0.4%	706 0.4%
Other	1021 6.6%	5075 5.9%	3129 5.3%	1195 4.5%	45 4.1%	8204 5.6%	10465 5.5%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

Language spoken at home

Twenty-one per cent of all women who attended for screening in 2001 indicated that they usually speak a language other than English at home. This proportion differed across age groups, with 21.9% of women aged 50–69 years, 17.7% of women aged 40–49 years and 17.0% of women aged 70–79 years usually speaking a language other than English at home. In the 2001 Census, 21% of the Victorian female population aged 40 years or more identified that they spoke a language other than English at home.

Aboriginal and/or Torres Strait Islander status

Table 4 shows the number of women who attended for screening and identified themselves as being Aboriginal and/or Torres Strait Islander (ATSI). The figure is similar to recent years.

In the 2001 Census, 0.25% of the female population of Victoria aged 40 years or more identified themselves as being Aboriginal and/or Torres Strait Islander. Participation rates for these women are presented in the following section of this report.

Table 4: Attendance by age and Aboriginal and/or Torres Strait Islander status

ATSI status	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Yes	34 0.2%	131 0.2%	79 0.1%	26 0.1%	1 0.1%	210 0.1%	271 0.1%
No	15460 99.7%	86442 99.8%	58606 99.7%	26602 99.8%	1093 99.8%	145048 99.8%	188203 99.7%
Not stated	17 0.1%	80 0.1%	72 0.1%	36 0.1%	1 0.1%	152 0.1%	206 0.1%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

Symptom status

The BreastScreen Program is designed for well women without breast symptoms or problems. It differs from a diagnostic service designed to investigate breast symptoms which may or may not be suspicious of breast cancer. Women complete a questionnaire before screening. The questionnaire asks, among other things, whether they have any breast symptoms and the nature of these. Although BreastScreen encourages women with symptoms to see their own doctor, BreastScreen services will screen women who arrive for their appointment and report a symptom.

Table 5 shows the symptom status of women at the time of screening. A total of 94.8% of all women screened reported no breast symptoms at the time of screening. As in previous years, younger women report symptoms more frequently than older women.

Table 5: Attendance by age and symptom status

Symptom status	Age group					50-69	Total
	40-49	50-59	60-69	70-79	80+		
Breast lump and/or nipple discharge	774 5.0%	1732 2.0%	688 1.2%	254 1.0%	37 3.4%	2420 1.7%	3485 1.8%
Other breast symptoms	1137 7.3%	2863 3.3%	1555 2.6%	741 2.8%	83 7.6%	4418 3.0%	6379 3.4%
No breast symptoms	13600 87.7%	82058 94.7%	56514 96.2%	25669 96.3%	975 89.0%	138572 95.3%	178816 94.8%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

Among the 3,485 women with a breast lump and/or nipple discharge,⁹ there were 755 women with symptoms (22%) that were considered suspicious of breast cancer, and for which recall for assessment was recommended under the policies of BreastScreen Victoria. This number comprises 590 women with a lump that had been present for less than 12 months which had not been investigated by a medical practitioner, and 165 women with a current bloodstained or watery nipple discharge. The proportion of women reporting a breast lump and/or nipple discharge who were recommended for assessment remained stable between 1997 and 2001, the period for which this BreastScreen Victoria policy has been in place. Three per cent of women reported other symptoms.¹⁰

⁹ The category 'breast lump and/or nipple discharge' includes women reporting a breast lump, or a bloodstained or watery nipple discharge.

¹⁰ The category 'other breast symptoms' includes a variety of symptoms, particularly women with breast pain or tenderness.

Family history of breast cancer

In Table 6, a 'strong family history' is defined as a woman whose mother, sister or daughter was diagnosed with breast cancer before 50 years of age, or whose father, brother or son was diagnosed with breast cancer at any age. Women who nominate other family members with breast cancer were classified as 'other family history'.

Women aged 40–49 years who attended for screening reported a family history of breast cancer more often than women aged 50 years and older.

Table 6: Attendance by age and family history of breast cancer

Family history of breast cancer	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Yes							
Strong family history	1219 7.9%	2683 3.1%	2073 3.5%	1180 4.4%	68 6.2%	4756 3.3%	7223 3.8%
Other family history	3089 19.9%	12336 14.2%	7438 12.7%	3414 12.8%	184 16.8%	19774 13.6%	26461 14.0%
No	11070 71.4%	71062 82.0%	48934 83.3%	21934 82.3%	837 76.4%	119996 82.5%	153837 81.5%
Not stated	133 0.9%	572 0.7%	312 0.5%	136 0.5%	6 0.5%	884 0.6%	1159 0.6%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

Personal history of breast cancer

In general, women with a personal history of breast cancer are discouraged from attending BreastScreen Victoria. It is advisable that these women have annual mammography and regular clinical examinations. From time to time, they may also need additional assessment. Women treated with breast conservation therapy for breast cancer have changes in the remaining breast tissue that can make mammographic interpretation difficult. Extra views may be required before a satisfactory examination is achieved. For these reasons, it is felt that the screening program is not suitable for their particular needs.

However, a small number of women with a personal history do attend for screening. The data in Table 7 should not be interpreted as representing the prevalence of breast cancer among the female population of Victoria.

The proportion of attenders nominating a personal history of breast cancer (0.2%) is similar to 2000 (0.3%). As in earlier years, the proportion of women with a personal history of breast cancer increased with age.

Table 7: Attendance by age and personal history of breast cancer

Personal history of breast cancer	Age group						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Yes	7 0.0%	79 0.1%	157 0.3%	168 0.6%	39 3.6%	236 0.2%	450 0.2%
No	15504 100.0%	86574 99.9%	58600 99.7%	26496 99.4%	1056 96.4%	145174 99.8%	188230 99.8%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

Breast implant status

The proportion of women who nominated that they had breast implants at the time of attending for screening is the same as for 2000.

Table 8: Attendance by age and breast implant status

Breast implant status	Age group						Total
	40-49	50-59	60-69	70-79	80+	50-69	
Yes	96 0.6%	731 0.8%	180 0.3%	18 0.1%	1 0.1%	911 0.6%	1026 0.5%
No	15415 99.4%	85922 99.2%	58577 99.7%	26646 99.9%	1094 99.9%	144499 99.4%	187654 99.5%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

Hormone replacement therapy use

Table 9 shows the number of women who nominated that they were taking hormone replacement therapy (HRT) at the time of attending for screening. A total of 25.4% of women attending for screening reported HRT use at the time of screening. HRT use was most prevalent in women aged 50–59 and 60–69 years.

Reported HRT use among women aged 40–49 years is 14.9% (16.1% in 2000). Previous years have shown a steady decrease from a high of 20.4% in 1995. Reported HRT use among women aged 50–59 years is 31.9%. Previous years have shown a steady decrease from a high of 37.8% in 1995. Among women aged 60 years and older screened in 2001, 20.8% reported HRT use. This proportion has steadily increased over time.

Table 9: Attendance by age and hormone replacement therapy use

HRT use	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Yes	2317 14.9%	27630 31.9%	14593 24.8%	3300 12.4%	76 6.9%	42223 29.0%	47916 25.4%
No	13178 85.0%	58914 68.0%	44084 75.0%	23321 87.5%	1012 92.4%	102998 70.8%	140509 74.5%
Not stated	16 0.1%	109 0.1%	80 0.1%	43 0.2%	7 0.6%	189 0.1%	255 0.1%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

Participation

The following five tables show participation rates for Victorian women who were screened by BreastScreen Victoria during the period 1 January 2000 to 31 December 2001 (a period of 24 months).

Participation rates by language spoken at home

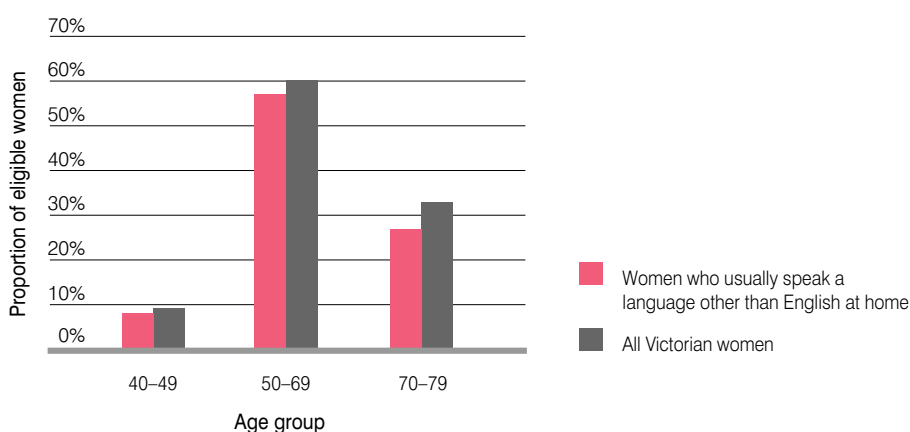
Table 10 shows the participation rate for all Victorian women and for women who usually speak a language other than English at home. The screening program directly targets women aged 50–69 years. The participation rate for all women aged 50–69 years was 60.2%, an improvement on the 2000 figure of 58.9%. The participation rate among women aged 40–49 was 9.2%. Among women aged 70–79 years, the participation rate has increased from 31.5% in 2000 to 33.0% in 2001.¹¹

Participation was 57.1% among women aged 50–69 years who usually speak a language other than English at home. This estimate is based on the 2001 Census count of the number of the latter residing in Victoria. This accounts for the apparent drop in participation rates compared with 2000 (60.9%) when the 1996 Census count of these women was used.¹²

Table 10: Participation rates by age and language spoken at home, 1 January 2000 to 31 December 2001

Language spoken at home		Age group		
		40–49	50–69	70–79
All women	Estimated number of eligible women resident in Victoria ¹³	344011	458711	158305
	Number of women screened	31576	275960	52317
	Participation rate	9.2%	60.2%	33.0%
Women who usually speak a language other than English at home	Estimated number of eligible women resident in Victoria ¹⁴	71170	103920	31394
	Number of women screened	5760	59390	8474
	Participation rate	8.1%	57.1%	27.0%

Figure 2: Participation of women by age and language spoken at home, 1 January 2000 to 31 December 2001



11 Participation rates were calculated using the average of the 2000 and 2001 Estimated Resident Populations of Victoria as the denominator (eligible women).

12 The Australian Bureau of Statistics does not calculate Estimated Resident Population by language spoken at home. Language spoken at home is only available in census years.

13 Australian Bureau of Statistics, Estimated Resident Population 2000; Australian Bureau of Statistics, Estimated Resident Population 2001. Counts are for women residing in Victorian postcodes allocated to BreastScreen Victoria catchments.

14 Australian Bureau of Statistics, Census of Population and Housing 2001. Counts are for women residing in Victorian postcodes allocated to BreastScreen Victoria catchments.

Participation rates by area of residence

Table 11 shows the participation rates by area of residence (capital city versus other) for all women and for women who usually speak a language other than English at home. The category 'capital city' includes Melbourne and surrounding suburbs. Among women in the target age group, participation is lower in the capital city than in the remainder of Victoria.

Table 11: Participation rates by age, area of residence and language spoken at home, 1 January 2000 to 31 December 2001

Language spoken at home		Age group		
		40–49	50–69	70–79
All women				
Capital city	Estimated number of eligible women resident in Victoria ¹⁵	254698	333522	111564
	Number of women screened	21819	193552	34877
	Participation rate	8.6%	58.0%	31.3%
Other than capital city	Estimated number of eligible women resident in Victoria ¹⁵	89313	125189	46741
	Number of women screened	9757	82408	17440
	Participation rate	10.9%	65.8%	37.3%
Women who usually speak a language other than English at home				
Capital city	Estimated number of eligible women resident in Victoria ¹⁶	67001	96310	28265
	Number of women screened	5367	54941	7554
	Participation rate	8.0%	57.0%	26.7%
Other than capital city	Estimated number of eligible women resident in Victoria ¹⁶	4169	7610	3129
	Number of women screened	393	4449	920
	Participation rate	9.4%	58.5%	29.4%

The national accreditation standard seeks to maximise the proportion of women aged 50–69 years who are screened, with the aim of screening 70% of this group. The national accreditation standard for participation by women in urban areas who speak languages other than English at home is at least 50% of the rate for the general population.

¹⁵ Australian Bureau of Statistics, Estimated Resident Population 2000; Australian Bureau of Statistics, Estimated Resident Population 2001. Counts are for women residing in Victorian postcodes allocated to BreastScreen Victoria catchments.

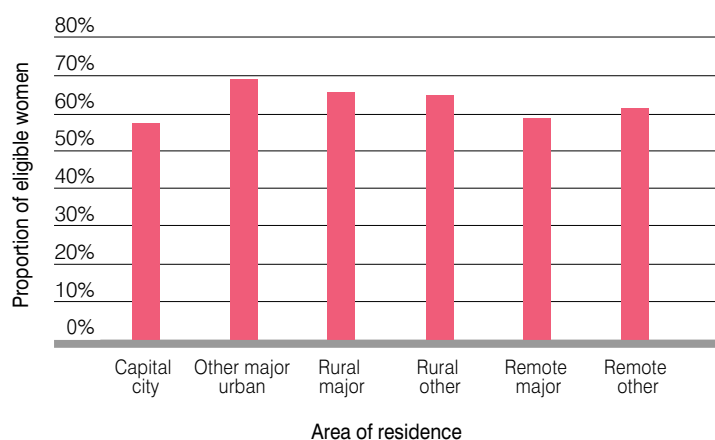
¹⁶ Australian Bureau of Statistics, Census of Population and Housing 2001. Counts are for women residing in Victorian postcodes allocated to BreastScreen Victoria catchments.

Table 12 shows participation by area of residence classified according to the 'Rural/Remote Areas Classification' of the Commonwealth Department of Health and Family Services, January 1994. The classifications of capital city, other major urban, rural major, rural other, remote major and remote other are based on population size and density. In areas that are neither wholly rural nor remote, judgements about relative remoteness are applied. Among women aged 50–69 years, participation rates varied from 58.0% in the capital city to 69.6% in other major urban areas.

Table 12: Participation rates by age and area of residence, 1 January 2000 to 31 December 2001¹⁷

Area of residence		Age group		
		40–49	50–69	70–79
Capital city	Estimated number of eligible women resident in Victoria	254698	333522	111564
	Number of women screened	21819	193552	34877
	Participation rate	8.6%	58.0%	31.3%
Other major urban	Estimated number of eligible women resident in Victoria	10792	15223	6282
	Number of women screened	1501	10596	2320
	Participation rate	13.9%	69.6%	36.9%
Rural major	Estimated number of eligible women resident in Victoria	23233	31325	12556
	Number of women screened	2174	20695	4503
	Participation rate	9.4%	66.1%	35.9%
Rural other	Estimated number of eligible women resident in Victoria	50791	72235	25472
	Number of women screened	5261	47271	9617
	Participation rate	10.4%	65.4%	37.8%
Remote major	Estimated number of eligible women resident in Victoria	3230	4417	1629
	Number of women screened	584	2616	626
	Participation rate	18.1%	59.2%	38.4%
Remote other	Estimated number of eligible women resident in Victoria	1267	1989	802
	Number of women screened	237	1230	374
	Participation rate	18.7%	61.8%	46.6%
Total	Estimated number of eligible women resident in Victoria	344011	458711	158305
	Number of women screened	31576	275960	52317
	Participation rate	9.2%	60.2%	33.0%

Figure 3: Participation of women aged 50–69 years by area of residence, 1 January 2000 to 31 December 2001



17 Australian Bureau of Statistics, Estimated Resident Population 2000; Australian Bureau of Statistics, Estimated Resident Population 2001. Counts are for women residing in Victorian postcodes allocated to BreastScreen Victoria catchments.

Participation rates by country of birth

Table 13 presents participation rates by country of birth.¹⁸ Participation rates for women aged 50–69 years vary considerably from a low of 49% in women born in Lebanon to a high of 72% in women born in Hong Kong. For women born in Australia, the participation rate is 66%.

Table 13: Participation rates by age and country of birth, 1 January 2000 to 31 December 2001

Country of birth		Age group		
		40–49	50–69	70–79
Australia	Estimated number of eligible women resident in Victoria	222097	259446	94171
	Number of women screened	21533	170413	36833
	Participation rate	9.7%	65.7%	39.1%
England ¹⁹	Estimated number of eligible women resident in Victoria	16008	29359	9429
	Number of women screened	1547	19603	3279
	Participation rate	9.7%	66.8%	34.8%
Italy	Estimated number of eligible women resident in Victoria	6117	22871	8731
	Number of women screened	673	15531	2827
	Participation rate	11.0%	67.9%	32.4%
Greece	Estimated number of eligible women resident in Victoria	4407	17410	3220
	Number of women screened	427	10950	914
	Participation rate	9.7%	62.9%	28.4%
The former Yugoslavia ²⁰	Estimated number of eligible women resident in Victoria	7183	11778	2339
	Number of women screened	547	6568	590
	Participation rate	7.6%	55.8%	25.2%
Germany	Estimated number of eligible women resident in Victoria	1672	7005	2729
	Number of women screened	161	4501	976
	Participation rate	9.6%	64.3%	35.8%
Scotland	Estimated number of eligible women resident in Victoria	3029	6441	2108
	Number of women screened	312	4017	672
	Participation rate	10.3%	62.4%	31.9%
Malta	Estimated number of eligible women resident in Victoria	2353	5857	1269
	Number of women screened	352	4026	389
	Participation rate	15.0%	68.7%	30.7%
Netherlands	Estimated number of eligible women resident in Victoria	1840	5827	1816
	Number of women screened	249	4088	764
	Participation rate	13.5%	70.2%	42.1%
Vietnam	Estimated number of eligible women resident in Victoria	6894	4164	1010
	Number of women screened	969	2596	222
	Participation rate	14.1%	62.3%	22.0%
New Zealand	Estimated number of eligible women resident in Victoria	5587	4089	679
	Number of women screened	465	2175	221
	Participation rate	8.3%	53.2%	32.5%
China	Estimated number of eligible women resident in Victoria	4281	3690	1236
	Number of women screened	301	1971	226
	Participation rate	7.0%	53.4%	18.3%

¹⁸ Area/country of birth, language spoken at home and ATSI status are only available in census years. The top 30 country of birth categories from the Australian Bureau of Statistics, Census of Population and Housing, 2001 were used to calculate participation rates by country of birth.

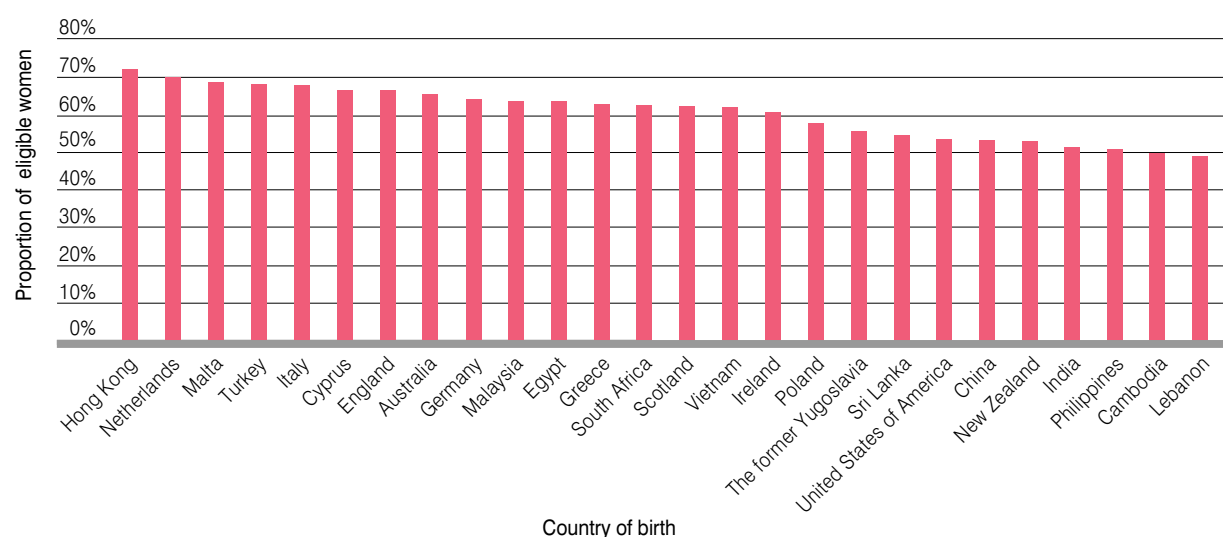
¹⁹ Numerator includes women who listed 'England' or 'United Kingdom' as their country of birth.

²⁰ Denominator includes women listing the Federal Republic of Yugoslavia, Bosnia and Herzegovina, Croatia or Macedonia as their country of birth. Women listing Slovenia are included in the numerator but not the denominator. This will be an overestimate of the true participation rate for this region.

India	Estimated number of eligible women resident in Victoria	2752	3316	884
	Number of women screened	201	1707	229
	Participation rate	7.3%	51.5%	25.9%
Sri Lanka	Estimated number of eligible women resident in Victoria	2985	2967	857
	Number of women screened	249	1622	230
	Participation rate	8.3%	54.7%	26.8%
Poland	Estimated number of eligible women resident in Victoria	2041	2962	2683
	Number of women screened	212	1718	713
	Participation rate	10.4%	58.0%	26.6%
Philippines	Estimated number of eligible women resident in Victoria	3921	2584	391
	Number of women screened	295	1324	65
	Participation rate	7.5%	51.2%	16.6%
Malaysia	Estimated number of eligible women resident in Victoria	3293	2531	320
	Number of women screened	329	1618	101
	Participation rate	10.0%	63.9%	31.6%
Egypt	Estimated number of eligible women resident in Victoria	1171	2241	832
	Number of women screened	100	1428	239
	Participation rate	8.5%	63.7%	28.7%
Cyprus	Estimated number of eligible women resident in Victoria	1063	1867	413
	Number of women screened	104	1247	124
	Participation rate	9.8%	66.8%	30.0%
Ireland	Estimated number of eligible women resident in Victoria	1025	1840	660
	Number of women screened	102	1119	209
	Participation rate	10.0%	60.8%	31.7%
South Africa	Estimated number of eligible women resident in Victoria	1545	1641	322
	Number of women screened	172	1031	127
	Participation rate	11.1%	62.8%	39.4%
Turkey	Estimated number of eligible women resident in Victoria	1446	1562	212
	Number of women screened	182	1069	53
	Participation rate	12.6%	68.4%	25.0%
Lebanon	Estimated number of eligible women resident in Victoria	1699	1368	270
	Number of women screened	108	674	43
	Participation rate	6.4%	49.3%	15.9%
Hong Kong	Estimated number of eligible women resident in Victoria	1834	1087	159
	Number of women screened	214	786	35
	Participation rate	11.7%	72.3%	22.0%
United States of America	Estimated number of eligible women resident in Victoria	1089	992	135
	Number of women screened	125	534	35
	Participation rate	11.5%	53.8%	25.9%
Cambodia	Estimated number of eligible women resident in Victoria	1059	746	150
	Number of women screened	72	372	29
	Participation rate	6.8%	49.9%	19.3%
Indonesia ²¹	Estimated number of eligible women resident in Victoria	548	614	153
	Number of women screened	89	652	59
	Participation rate	16.2%	106.2%	38.6%

21 The participation rate for Indonesia is an overestimate of the true proportion due to coding discrepancies with Indonesia and East Timor.

Figure 4: Participation of women aged 50–69 years by country of birth, 1 January 2000 to 31 December 2001



Participation rates by Aboriginal and/or Torres Strait Islander status

Table 14 presents participation rates by Aboriginal and/or Torres Strait Islander (ATSI) status.²² Participation rates for women of all ages is lower for these women with a participation rate of 37.6% in women aged 50–69 years.

Table 14: Participation rates by age and Aboriginal and/or Torres Strait Islander status, 1 January 2000 to 31 December 2001

ATSI status	Age group		
	40–49	50–69	70–79
Estimated number of eligible ATSI women resident in Victoria	1238	1087	206
Number of ATSI women screened	73	409	51
Participation rate	5.9%	37.6%	24.8%

²² Area/country of birth, language spoken at home and ATSI status are only available in census years. Data from the Australian Bureau of Statistics, Census of Population and Housing, 2001 were used to calculate participation rates by ATSI status. Counts are for women residing in Victorian postcodes allocated to BreastScreen Victoria catchments.

Response to invitations based on the electoral roll

BreastScreen targets women in the age group 50–69 years as mammography has been found to be most effective in this group. BreastScreen has been permitted access to the electoral roll to invite for screening women who are approaching the age of 50 and who have not previously attended BreastScreen Victoria. In 2000 and 2001 a more extensive invitation program included all women aged 50–69 years who had not previously attended BreastScreen Victoria. Women are sent a written invitation for screening; if no response is received within one month, a second invitation letter is posted.

A total of 62,632 women were sent an invitation for screening during 2001. Appointments for screening were made for 12,924 of these women, representing a response rate of 21%. This result is similar to the response rate of 24% in 2000 and lower than the response rates of 37% in 1999 and 36% in 1998. The lower response rate can be accounted for by the more extensive invitation program.

It is not certain that all of these appointments were made solely in response to the invitation letter based on the electoral roll; some of the women may have responded to other recruitment initiatives such as newspaper articles or television advertisements. Of all invitations sent, 4% were returned, unable to be delivered.

Rescreen rates

Response to routine rescreen invitations

Women in the age group 50–74 years receive a reminder for rescreening 23 months²³ after their last attendance if no further appointment has been made at the woman’s initiative. For women aged 40–49 years, reminders are only sent if there is a strong family history of breast cancer, a personal history of breast cancer or a significant abnormality (defined as lobular carcinoma in situ or atypical ductal hyperplasia). If there is no response within six months, a second reminder letter is posted.

A total of 161,402 women were sent reminder letters for rescreening during 2001. Appointments for rescreening were made for 133,001 of these women, representing a response rate of 82%. This remains unchanged from 2000.

Of these invitations, 2% of the letters were returned, unable to be delivered.

Rescreen rates by language spoken at home

Table 15 shows the proportion of women screened during 1999 who were rescreened by BreastScreen Victoria within 27 months of their previous attendance.²⁴ The nominated age ranges refer to the ages of the women at the time of their 1999 screen. Rates are given for all women and for women who usually speak a language other than English at home.

The rescreen rates are comparable to the rates presented last year. In the 2000 Annual Statistical Report, the rescreen rates were reported as 81.2% for women aged 50–59 years, 84.6% for women aged 60–69 years and 82.6% for women aged 50–69 years.

Rescreen rates among women who usually speak a language other than English at home were slightly lower than among all women across all age groups.

Table 15: Rescreen rates by age and language spoken at home, for women who attended in 1999

Language spoken at home	Age group					
	40–49	50–59	60–69	70–79	80+	50–69
All women						
Women screened during 1999	17276	77725	51180	23124	776	128905
Women rescreened within following 27 months	6885	63589	43324	13899	112	106913
Rescreen rate	39.9%	81.8%	84.7%	60.1%	14.4%	82.9%
Women who usually speak a language other than English at home						
Women screened during 1999	3143	15828	11760	3520	49	27588
Women rescreened within following 27 months	1233	12858	9643	2080	6	22501
Rescreen rate	39.2%	81.2%	82.0%	59.1%	12.2%	81.6%

²³ Women who are recommended for annual screening will receive an invitation after 11 months if no appointment has been made.

²⁴ Rescreen rates correspond to a 'crude' rescreen rate for women screened between 1 January 1999 and 31 December 1999. The table excludes women at high risk who were recommended for annual screening and women resident interstate at the time of their 1999 screening. A woman was counted as 'rescreened within the following 27 months' if she returned to be rescreened within 821 days of the previous 1999 mammogram.

Rescreen rates by area of residence

Table 16 presents rescreen rates for women living in urban and rural areas. The rescreen rates for women living in urban²⁵ areas are slightly lower than those for women living in rural²⁶ areas.

Table 16: Rescreen rates by age and area of residence, for women who attended in 1999

Area of residence	Age group					50-69
	40-49	50-59	60-69	70-79	80+	
Urban						
Women screened during 1999	12499	57490	36412	16184	499	93902
Women rescreened within following 27 months	4895	46785	30741	9655	69	77526
Rescreen rate	39.2%	81.4%	84.4%	59.7%	13.8%	82.6%
Rural						
Women screened during 1999	4777	20235	14768	6940	277	35003
Women rescreened within following 27 months	1990	16804	12583	4244	43	29387
Rescreen rate	41.7%	83.0%	85.2%	61.2%	15.5%	84.0%

25 References to 'urban' include capital city and other major urban according to the 'Rural/Remote Areas Classification' of the Commonwealth Department of Health and Family Services, January 1994.

26 References to 'rural' include rural major, rural other, remote major and remote other according to the 'Rural/Remote Areas Classification' of the Commonwealth Department of Health and Family Services, January 1994.

Results of screening

Number of films

Women who attend for screening generally have two x-rays of each breast, giving a total of four films.

Table 17 shows the number of women by age group who had four or more films taken. 'Technical reasons' for additional films include over- and under-exposure of films. 'Other reasons' for additional films include large breasts, positioning problems and breast implants. Results are highly comparable with previous years.

Table 17: Number of films taken per woman by age

Number of films taken	Age group					50-69	Total
	40-49	50-59	60-69	70-79	80+		
Four films	13131 84.7%	71813 82.9%	47821 81.4%	21489 80.6%	886 80.9%	119634 82.3%	155140 82.2%
More than four films							
Technical reasons	792 5.1%	4259 4.9%	2703 4.6%	1331 5.0%	65 5.9%	6962 4.8%	9150 4.8%
Other reasons	1588 10.2%	10581 12.2%	8233 14.0%	3844 14.4%	144 13.2%	18814 12.9%	24390 12.9%
Total	15511 100%	86653 100%	58757 100%	26664 100%	1095 100%	145410 100%	188680 100%

The percentage of films taken as technical repeat films is shown in Table 18. Overall, 1.4% of all films taken were technical repeat films, with the percentage varying little across women of different age groups.

Table 18: Number of technical repeat films taken by age

Number of technical repeat films taken	Age group					50-69	Total
	40-49	50-59	60-69	70-79	80+		
Films taken	67024	378672	257511	116349	4714	636183	824270
Technical repeat films taken	1076	5507	3318	1631	77	8825	11609
Proportion of technical repeat films	1.6%	1.5%	1.3%	1.4%	1.6%	1.4%	1.4%

The national accreditation standard requires that less than 3% of total films taken are technical repeat films

Outcome of screening

Table 19²⁷ shows, among first attenders and subsequent attenders, the number of women within each age group who were recommended for routine rescreening and the number recommended for further assessment. 'Assessment recommended – other' mainly comprises women with breast implants and women with 'other' symptoms²⁸ but normal mammography. It also includes a small number of women with a personal history of breast cancer and women who were called back for repeat mammography because of technical reasons but who were not subsequently cleared for routine rescreen. While 10.6% of first attenders had assessment recommended, the comparable figure for subsequent attenders was 4.8%. These figures are comparable to 2000 when 10.6% of first attenders and 5.0% of subsequent attenders were recommended for assessment.

Table 19: Outcome of screening by age and round

Type of attendance	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
First attendance							
Routine rescreen recommended	8604 89.6%	15626 88.8%	6000 90.4%	1592 90.0%	277 90.8%	21626 89.3%	32099 89.4%
Assessment recommended							
Abnormal mammography	779 8.1%	1597 9.1%	549 8.3%	149 8.4%	24 7.9%	2146 8.9%	3098 8.6%
Symptoms/signs of possible breast cancer	105 1.1%	88 0.5%	22 0.3%	10 0.6%	1 0.3%	110 0.5%	226 0.6%
Abnormal mammography and symptoms/signs	28 0.3%	33 0.2%	13 0.2%	10 0.6%	1 0.3%	46 0.2%	85 0.2%
Other	88 0.9%	246 1.4%	51 0.8%	7 0.4%	2 0.7%	297 1.2%	394 1.1%
Subtotal for assessment recommended	1000 10.4%	1964 11.2%	635 9.6%	176 10.0%	28 9.2%	2599 10.7%	3803 10.6%
Subtotal	9604 100%	17590 100%	6635 100%	1768 100%	305 100%	24225 100%	35902 100%
Subsequent attendance							
Routine rescreen recommended	5494 93.0%	65414 94.7%	49778 95.5%	23938 96.2%	758 95.9%	115192 95.1%	145382 95.2%
Assessment recommended							
Abnormal mammography	281 4.8%	2822 4.1%	2029 3.9%	855 3.4%	25 3.2%	4851 4.0%	6012 3.9%
Symptoms/signs of possible breast cancer	60 1.0%	176 0.3%	79 0.2%	42 0.2%	4 0.5%	255 0.2%	361 0.2%
Abnormal mammography and symptoms/signs	15 0.3%	40 0.06%	21 0.04%	6 0.02%	1 0.1%	61 0.05%	83 0.05%
Other	57 1.0%	607 0.9%	211 0.4%	52 0.2%	2 0.3%	818 0.7%	929 0.6%
Subtotal for assessment recommended	413 7.0%	3645 5.3%	2340 4.5%	955 3.8%	32 4.1%	5985 4.9%	7385 4.8%
Subtotal	5907 100%	69059 100%	52118 100%	24893 100%	790 100%	121177 100%	152767 100%

The national accreditation standard is that less than 10% of women screened should be recalled for mammographic assessment at the prevalent round, and less than 5% at the incident round.

27 The information in the above table excludes data for six first attenders and five subsequent attenders where the outcome of screening is unknown. These women were requested to return for further films but elected not to attend.

28 The category 'other breast symptoms' includes a variety of symptoms, particularly women with breast pain or tenderness.

Results of assessment

Range of assessment procedures

Of the 11,188 women who were recommended for assessment (see Table 19), 88 women either declined or failed to attend for assessment, and 544 women were assessed privately. This left 10,556 women assessed within the BreastScreen Victoria Program; 32 of these women were cleared for routine rescreen without any further investigations being performed.

For the 10,524 women who underwent assessment investigations within BreastScreen Victoria, Table 20 shows the investigations performed for these women.

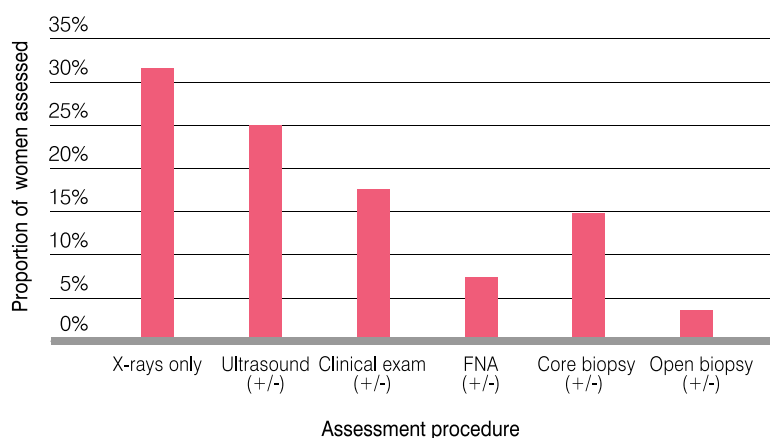
Table 20: Range of assessment procedures performed by age²⁹

Assessment procedures performed	Number of women by age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
X-rays only	381 28.5%	1668 32.1%	937 33.0%	330 30.3%	5 9.1%	2605 32.4%	3321 31.6%
Ultrasound +/- x-rays	338 25.3%	1323 25.4%	694 24.5%	266 24.4%	7 12.7%	2017 25.1%	2628 25.0%
Clinical examination +/- ultrasound +/- x-rays	318 23.8%	985 18.9%	391 13.8%	144 13.2%	15 27.3%	1376 17.1%	1853 17.6%
Fine needle aspiration +/- clinical examination +/- ultrasound +/- x-rays	123 9.2%	365 7.0%	200 7.0%	85 7.8%	10 18.2%	565 7.0%	783 7.4%
Core biopsy +/- fine needle aspiration +/- clinical examination +/- ultrasound +/- x-rays	136 10.2%	680 13.1%	500 17.6%	230 21.1%	15 27.3%	1180 14.7%	1561 14.8%
Open biopsy +/- core biopsy +/- fine needle aspiration +/- clinical examination +/- ultrasound +/- x-rays	42 3.1%	182 3.5%	116 4.1%	35 3.2%	3 5.5%	298 3.7%	378 3.6%
Total	1338 100%	5203 100%	2838 100%	1090 100%	55 100%	8041 100%	10524 100%

²⁹ Of the 378 women who had an open biopsy, 220 (58%) had the procedure performed within BreastScreen Victoria and 158 (42%) had the procedure performed elsewhere.

Figure 5 shows the range of assessment procedures performed, using the same sequence of investigations as in Table 20. For example, if a woman underwent a core biopsy but not an open biopsy, she is counted in the core biopsy column; she may also have undergone a combination of further x-rays, ultrasound, clinical examination and fine needle aspiration (FNA) prior to the core biopsy.

Figure 5: Range of assessment procedures performed



Almost one-third of the women (31.6%) received only further x-rays. An additional 25% had ultrasound \pm x-rays and 17.6% received clinical examination \pm ultrasound \pm x-rays. Thus, 74% of the 10,524 women were able to have their status ascertained without the need for an invasive procedure, namely fine needle aspiration or tissue biopsy.

Outcome of assessment

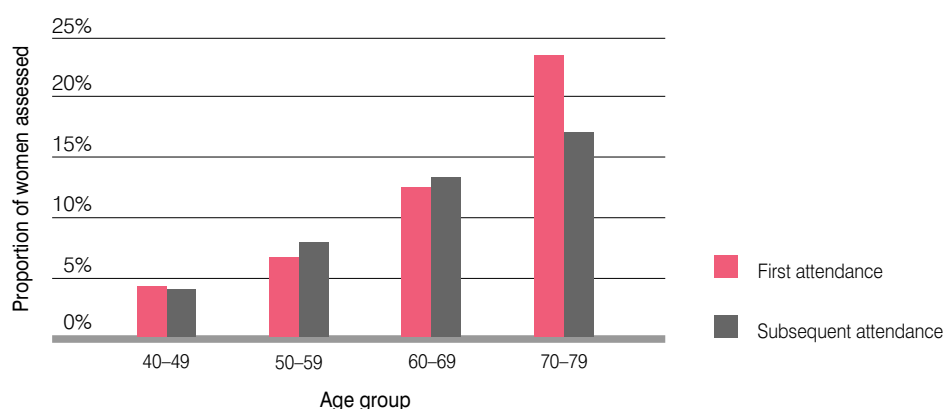
A total of 11,188 women were recommended for assessment for reasons that are listed in Table 19. Table 21 shows, among first and subsequent attenders, the final outcome of assessment, and includes outcomes for women assessed within and outside the BreastScreen Victoria Program. Where a woman was determined to have multiple lesions, only the most significant of these is counted. 'Malignant lesion' includes a diagnosis of invasive cancer or ductal carcinoma in situ (DCIS).

Table 21: Outcome of assessment by age and round

Type of attendance	Age group					50-69	Total
	40-49	50-59	60-69	70-79	80+		
First attendance							
No malignant lesion	951 95.1%	1815 92.4%	551 86.8%	135 76.7%	21 75.0%	2366 91.0%	3473 91.3%
Malignant lesion	42 4.2%	129 6.6%	79 12.4%	41 23.3%	7 25.0%	208 8.0%	298 7.8%
Early review	6 0.6%	19 1.0%	5 0.8%	0 0.0%	0 0.0%	24 0.9%	30 0.8%
Other	1 0.1%	1 0.1%	0 0.0%	0 0.0%	0 0.0%	1 0.0%	2 0.1%
Total	1000 100%	1964 100%	635 100%	176 100%	28 100%	2599 100%	3803 100%
Subsequent attendance							
No malignant lesion	394 95.4%	3339 91.6%	2011 85.9%	783 82.0%	20 62.5%	5350 89.4%	6547 88.7%
Malignant lesion	16 3.9%	284 7.8%	308 13.2%	161 16.9%	11 34.4%	592 9.9%	780 10.6%
Early review	3 0.7%	20 0.5%	19 0.8%	11 1.2%	0 0.0%	39 0.7%	53 0.7%
Other	0 0.0%	2 0.1%	2 0.1%	0 0.0%	1 3.1%	4 0.1%	5 0.1%
Total	413 100%	3645 100%	2340 100%	955 100%	32 100%	5985 100%	7385 100%

A total of 1,078 malignant lesions were diagnosed.³⁰ Among women recommended for assessment, the proportion for whom a malignancy was diagnosed increased with age, as shown in Figure 6.

³⁰ Of the 1,078 malignant lesions diagnosed by the program, 14 are classified as interval cancers in accordance with the BreastScreen Australia definition: Kavanagh AM, Amos AF and Marr GM (1999), *The Ascertainment and Reporting of Interval Cancers within the BreastScreen Australia Program*, NHMRC National Breast Cancer Centre.

Figure 6: Diagnosis of malignant lesions in women recommended for assessment by age

Tables 22–25 show results for invasive assessment investigations performed within BreastScreen Victoria.

Fine needle aspiration biopsy results

Table 22 lists the results of 1,301 fine needle aspiration biopsies. One fine needle aspiration is counted per woman; i.e. if a woman undergoes multiple fine needle aspirations, the most significant result is counted. Of women aged 50–69 years who underwent a fine needle biopsy, 18.2% had a malignant result. One hundred and fifty women (15.9%) in the 50–69 year age group were reported as having no definitive result.

Table 22: Outcome of fine needle aspiration biopsy by age

FNA biopsy result	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Inadequate specimen	28 15.9%	50 8.6%	36 10.1%	24 14.3%	0 0.0%	86 9.1%	138 10.6%
Benign	58 33.0%	212 36.3%	103 28.9%	33 19.6%	7 43.8%	315 33.5%	413 31.7%
Atypical/Equivocal	11 6.3%	39 6.7%	25 7.0%	11 6.5%	2 12.5%	64 6.8%	88 6.8%
Suspicious	4 2.3%	40 6.8%	28 7.8%	13 7.7%	1 6.3%	68 7.2%	86 6.6%
Malignant	11 6.3%	87 14.9%	84 23.5%	55 32.7%	5 31.3%	171 18.2%	242 18.6%
Cyst fluid aspirated	64 36.4%	156 26.7%	81 22.7%	32 19.0%	1 6.3%	237 25.2%	334 25.7%
Total	176 100%	584 100%	357 100%	168 100%	16 100%	941 100%	1301 100%

Core biopsy results

Table 23 lists the results of 1,753 core biopsies. One core biopsy is counted per woman; i.e. if a woman undergoes multiple core biopsies, the most significant result is counted. Of women aged 50–69 years who underwent a core biopsy, 47.1% had a malignant result. Seventy-three women (5.4%) in the 50–69 year age group were reported as having no definitive result.

Table 23: Outcome of core biopsy by age

Core biopsy result	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Inadequate specimen	1 0.6%	6 0.8%	2 0.4%	1 0.4%	0 0.0%	8 0.6%	10 0.6%
Benign	95 60.9%	371 47.6%	212 37.7%	72 30.3%	2 12.5%	583 43.4%	752 42.9%
Atypical/Equivocal	8 5.1%	39 5.0%	26 4.6%	4 1.7%	0 0.0%	65 4.8%	77 4.4%
Suspicious	1 0.6%	11 1.4%	10 1.8%	1 0.4%	0 0.0%	21 1.6%	23 1.3%
Malignant	46 29.5%	330 42.3%	302 53.6%	157 66.0%	13 81.3%	632 47.1%	848 48.4%
Atypical ductal hyperplasia	5 3.2%	20 2.6%	10 1.8%	3 1.3%	1 6.3%	30 2.2%	39 2.2%
Lobular carcinoma in situ	0 0.0%	3 0.4%	1 0.2%	0 0.0%	0 0.0%	4 0.3%	4 0.2%
Total	156 100%	780 100%	563 100%	238 100%	16 100%	1343 100%	1753 100%

Open biopsy results

In Table 20, 378 women were reported as undergoing an open biopsy. Open biopsy was recommended for 371 of these women. The remaining seven women chose to have an open biopsy. Table 24 lists the results for the 371 women who were recommended for open biopsy. One open biopsy is counted per woman; i.e. if a woman undergoes multiple open biopsies, the most significant result is counted. Of women aged 50–69 years who underwent an open biopsy, 28.1% had a malignant result. Three women (1%) in the 50–69 year age group were reported as having no definitive result.

Table 24: Outcome of open biopsy by age

Open biopsy result	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Malignancy – breast	5 12.2%	38 21.6%	44 37.9%	11 32.4%	1 25.0%	82 28.1%	99 26.7%
Benign	36 87.8%	136 77.3%	71 61.2%	22 64.7%	2 50.0%	207 70.9%	267 72.0%
No definitive result	0 0.0%	2 1.1%	1 0.9%	1 2.9%	0 0.0%	3 1.0%	4 1.1%
Malignancy – other site	0 0.0%	0 0.0%	0 0.0%	0 0.0%	1 25.0%	0 0.0%	1 0.3%
Total	41 100%	176 100%	116 100%	34 100%	4 100%	292 100%	371 100%

Preoperative diagnosis of breast cancer

Of the 1,078 women diagnosed with breast cancer in 2001, 1,060 women were assessed within the BreastScreen Victoria Program. Table 25 shows the most invasive biopsy performed for these 1,060 women.

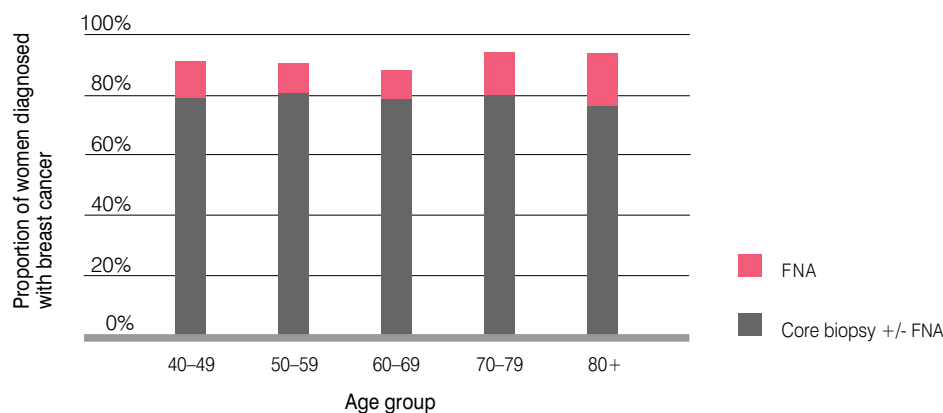
Table 25: Breast cancer diagnosis by age and most invasive biopsy

Most invasive biopsy	Age group					50–69	Total
	40–49	50–59	60–69	70–79	80+		
Fine needle aspiration	7 12.1%	39 9.6%	37 9.7%	28 14.1%	3 17.6%	76 9.7%	114 10.8%
Core biopsy +/- fine needle aspiration	46 79.3%	328 81.0%	301 78.8%	159 80.3%	13 76.5%	629 79.9%	847 79.9%
Open biopsy +/- core biopsy +/- fine needle aspiration	5 8.6%	38 9.4%	44 11.5%	11 5.6%	1 5.9%	82 10.4%	99 9.3%
Total	58 100%	405 100%	382 100%	198 100%	17 100%	787 100%	1060 100%

For women who have breast cancer, it is preferable that a definite diagnosis is reached without the need for open biopsy, otherwise described as a preoperative diagnosis. Ninety-one per cent of women diagnosed with breast cancer received their diagnosis without requiring an open biopsy.

Figure 7 shows the proportion of women diagnosed with breast cancer whose most invasive procedure was fine needle aspiration (FNA) or core biopsy.

Figure 7: Preoperative diagnosis of breast cancer by age



Recommendation for routine rescreening

Of the 188,680 women who attended for screening, 177,481 were recommended for routine rescreening without requiring assessment (see Table 19). Of the 11,188 women who were recommended for assessment, the 10,020 women who were assessed as having no malignant lesion were also recommended for routine rescreening (see Table 21). Thus, a total of 187,501 (99.4%) women were ultimately recommended for routine rescreening.

Table 26 shows the distribution by age group of the recommendations for routine rescreening. The usual recommendation is for routine rescreening at two years.³¹ Only 0.4% of all women screened were advised to return at one year. Annual screening was more frequently recommended for older women than other age groups. These figures are similar to those in 2000. Reasons for a recommendation for rescreening at one year include a personal history of mastectomy for breast cancer, atypical ductal hyperplasia or lobular carcinoma in situ.

Table 26: Recommendation for routine rescreen by age

Routine rescreen recommendation	Age group					50-69	Total
	40-49	50-59	60-69	70-79	80+		
Rescreen at 2 years	15420 99.9%	85974 99.7%	58084 99.6%	26225 99.2%	1038 96.4%	144058 99.7%	186741 99.6%
Rescreen at 1 year	23 0.1%	220 0.3%	256 0.4%	222 0.8%	39 3.6%	476 0.3%	760 0.4%
Total	15443 100%	86194 100%	58340 100%	26447 100%	1077 100%	144534 100%	187501 100%

Breast cancer detection

There were 1,078 breast cancers diagnosed among the 188,680 women who attended for screening in 2001. Of these 1,078 cancers, fourteen meet the criteria of interval cancer. Twelve cancers were diagnosed at early review more than six months after the screening examination; two cancers were diagnosed at early rescreen at which time a lump and/or bloodstained or watery nipple discharge was present in the same breast in which the cancer was diagnosed. Tables 27–32 and 35–41 include only the 1,064 cancers that are considered screen-detected cancers.

Breast cancer diagnosis rate by attendance round

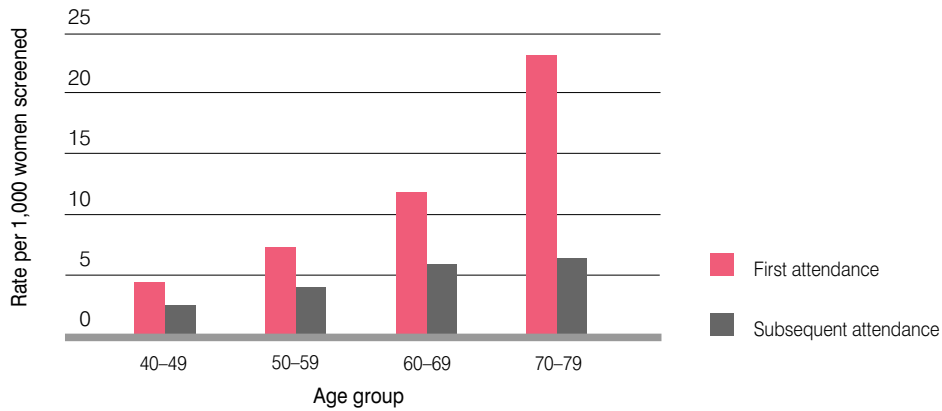
Table 27 shows the rate of breast cancer per 1,000 women screened by attendance round, mammographic status, symptom status and personal history of breast cancer for each ten-year age group. As in Table 5, a symptomatic woman was defined as a woman with a breast lump and/or bloodstained or watery nipple discharge.

Table 27: Breast cancer detection rate by age, round, mammography status, symptom status and personal history of breast cancer

Type of attendance	Age group						Total Av. rate (95% C.I.) ³²
	40–49	50–59	60–69	70–79	80+	50–69	
First attendance							
Radiographic abnormality; asymptomatic women with no personal history of breast cancer							
Number of cancers	31	108	66	26	6	174	237
Rate per 1,000 women screened	3.8	6.6	10.6	16.3	23.2	7.7	7.3 (6.4–8.2)
Symptomatic and/or personal history of breast cancer ³³							
Number of cancers	9	13	7	10	1	20	40
Rate per 1,000 women screened	17.0	23.7	38.7	142.9	43.5	27.4	29.6 (21.2–40.1)
'Other breast symptoms', no personal history of breast cancer and radiographic abnormality							
Number of cancers	2	7	5	5	0	12	19
Rate per 1,000 women screened	2.5	9.0	21.7	50.5	0.0	11.9	9.8 (5.9–15.3)
Subsequent attendance							
Radiographic abnormality; asymptomatic women with no personal history of breast cancer							
Number of cancers	13	254	283	138	8	537	696
Rate per 1,000 women screened	2.4	3.9	5.6	5.8	11.7	4.6	4.8 (4.4–5.1)
Symptomatic and/or personal history of breast cancer ³³							
Number of cancers	1	18	13	10	1	31	43
Rate per 1,000 women screened	4.0	14.3	19.6	28.5	19.6	16.1	16.7 (12.1–22.4)
'Other breast symptoms', no personal history of breast cancer and radiographic abnormality							
Number of cancers	1	4	11	12	1	15	29
Rate per 1,000 women screened	3.1	1.9	8.3	18.8	17.2	4.4	6.5 (4.4–9.4)

³² The 95% confidence interval (C.I.) provides a measure of the extent of variation that might be expected by chance for a given estimate. The larger the number of observations, the narrower the confidence interval and thus the more meaningful the estimate. Wider confidence intervals indicate less stability in the estimate and hamper comparison of data across years.

³³ These women may or may not have had a radiographic abnormality.

Figure 8: Breast cancer detection rate by age and attendance round

Among asymptomatic women with no personal history of breast cancer who were attending BreastScreen Victoria for the first time, the crude rate of breast cancer diagnosis was 7.3 per 1,000 women screened. The crude rate among asymptomatic subsequent attenders was 4.8 per 1,000 attenders. In 2000, the comparable figures for asymptomatic attenders were 6.4 per 1,000 first round attenders and 5.5 per 1,000 subsequent round attenders.

As in previous years, symptomatic women and/or women with a personal history of breast cancer have rates of breast cancer diagnosis that are three to four times higher than asymptomatic women. The rate of diagnosis of breast cancer is lower among subsequent attenders because women at first round screening may have cancers that have recently developed or cancers that have been present for some years.

Size of breast cancer

Tables 28 and 29 show the number and rate of breast cancer diagnosis by size of tumour for each ten-year age group and by attendance round. This information is only presented for invasive breast cancers, as dimensions of ductal carcinoma in situ are not usually given.

Among first round attenders, 51% of breast cancers were 15 mm or less in diameter (52% in 2000). Among subsequent attenders, 66% of breast cancers were 15 mm or less in diameter (69% in 2000). A small diameter tumour at diagnosis is generally considered predictive of an improved prognosis.

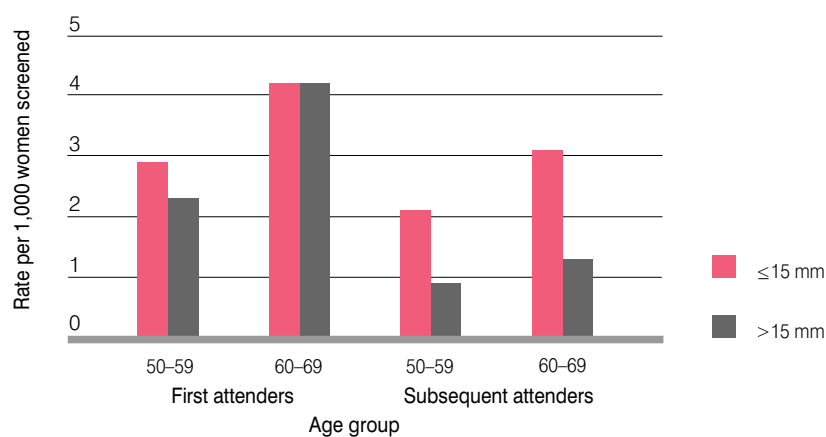
The rates of invasive cancers 10 mm or less in size were 1.6 per 1,000 women screened for both first and subsequent attenders.

Table 28: Breast cancer detection rate by age and size of invasive breast cancer for first attendance

Size	Age group					50-69	Total Av. rate (95% C.I.)
	40-49	50-59	60-69	70-79	80+		
First attendance							
10 mm or less							
Number of cancers	9	24	13	10	3	37	59
	25.0%	25.8%	22.8%	27.0%	42.9%	24.7%	25.7%
Rate per 1,000 women screened	0.9	1.4	2.0	5.7	9.8	1.5	1.6 (1.2-2.1)
11 mm to 15 mm							
Number of cancers	6	27	15	8	2	42	58
	16.7%	29.0%	26.3%	21.6%	28.6%	28.0%	25.2%
Rate per 1,000 women screened	0.6	1.5	2.3	4.5	6.6	1.7	1.6 (1.2-2.1)
More than 15 mm							
Number of cancers	19	41	28	17	2	69	107
	52.8%	44.1%	49.1%	45.9%	28.6%	46.0%	46.5%
Rate per 1,000 women screened	2.0	2.3	4.2	9.6	6.6	2.8	3.0 (2.4-3.6)
Unknown							
Number of cancers	2	1	1	2	0	2	6
	5.6%	1.1%	1.8%	5.4%	0.0%	1.3%	2.6%
Rate per 1,000 women screened	0.2	0.1	0.2	1.1	0.0	0.1	0.2 (0.1-0.4)
Total							
Number of cancers	36	93	57	37	7	150	230
	100%	100%	100%	100%	100%	100%	100%
Rate per 1,000 women screened	3.7	5.3	8.6	20.9	23.0	6.2	6.4 (5.6-7.3)

Table 29: Breast cancer detection rate by age and size of invasive breast cancer for subsequent attendance

Size	Age group					50-69	Total Av. rate (95% C.I.)
	40-49	50-59	60-69	70-79	80+		
Subsequent attendance							
10 mm or less							
Number of cancers	4	91	100	49	4	191	248
	44.4%	41.9%	41.5%	35.5%	44.4%	41.7%	40.4%
Rate per 1,000 women screened	0.7	1.3	1.9	2.0	5.1	1.6	1.6 (1.4-1.8)
11 mm to 15 mm							
Number of cancers	0	57	64	37	2	121	160
	0.0%	26.3%	26.6%	26.8%	22.2%	26.4%	26.1%
Rate per 1,000 women screened	0.0	0.8	1.2	1.5	2.5	1.0	1.0 (0.9-1.2)
More than 15 mm							
Number of cancers	4	62	69	50	3	131	188
	44.4%	28.6%	28.6%	36.2%	33.3%	28.6%	30.6%
Rate per 1,000 women screened	0.7	0.9	1.3	2.0	3.8	1.1	1.2 (1.1-1.4)
Unknown							
Number of cancers	1	7	8	2	0	15	18
	11.1%	3.2%	3.3%	1.4%	0.0%	3.3%	2.9%
Rate per 1,000 women screened	0.2	0.1	0.2	0.1	0.0	0.1	0.1 (0.07-0.19)
Total							
Number of cancers	9	217	241	138	9	458	614
	100%	100%	100%	100%	100%	100%	100%
Rate per 1,000 women screened	1.5	3.1	4.6	5.5	11.4	3.8	4.0 (3.7-4.3)

Figure 9: Breast cancer detection rate by age, size and attendance round

The national accreditation standard is that at least 0.8 cancers per 1,000 women screened have a diameter of 10 mm or less.

Histologic type of breast cancer

Of the 1,064 cases of breast cancer diagnosed in total, 844 (79%) were invasive and 220 (21%) were ductal carcinoma in situ (DCIS). Of the 296 cases of breast cancer among first attenders, 78% were invasive in nature; 22% were diagnosed as DCIS. Among subsequent attenders, 80% of the 768 cases were invasive in nature; 20% were DCIS.

Table 30 shows the number and rate of breast cancer diagnosis by type (invasive or DCIS) for each ten-year age group. Among women aged 50–69 years, the rate of invasive cancer detection was 6.2 per 1,000 women screened for first attenders, and 3.8 per 1,000 women for subsequent attenders. The rate of diagnosis of DCIS was 2.3 per 1,000 women screened among first attenders in the target age group, and 1.0 among subsequent attenders.

Table 30: Invasive breast cancer and DCIS detection rate by age and round

Type of attendance	Age group					50–69	Total Av. rate (95% C.I.)
	40–49	50–59	60–69	70–79	80+		
First attendance							
Invasive							
Number of cancers	36	93	57	37	7	150	230
Rate per 1,000 women screened	3.7	5.3	8.6	20.9	23.0	6.2	6.4 (5.6–7.3)
Ductal carcinoma in situ							
Number of cancers	6	35	21	4	0	56	66
Rate per 1,000 women screened	0.6	2.0	3.2	2.3	0.0	2.3	1.8 (1.4–2.3)
Subsequent attendance							
Invasive							
Number of cancers	9	217	241	138	9	458	614
Rate per 1,000 women screened	1.5	3.1	4.6	5.5	11.4	3.8	4.0 (3.7–4.3)
Ductal carcinoma in situ							
Number of cancers	6	59	66	22	1	125	154
Rate per 1,000 women screened	1.0	0.9	1.3	0.9	1.3	1.0	1.0 (0.9–1.2)
Total							
Number of cancers	57	404	385	201	17	789	1064
Rate per 1,000 women screened	3.7	4.7	6.6	7.5	15.5	5.4	5.6 (5.3–6.0)

The national accreditation standard is that 10–20% of the cancers detected should be ductal carcinoma in situ.

Among the 220 cases of DCIS diagnosed, 126 (58%) were classified as high grade, 54 (25%) as intermediate grade and 38 (17%) as low grade. Grade was unknown for two cases.

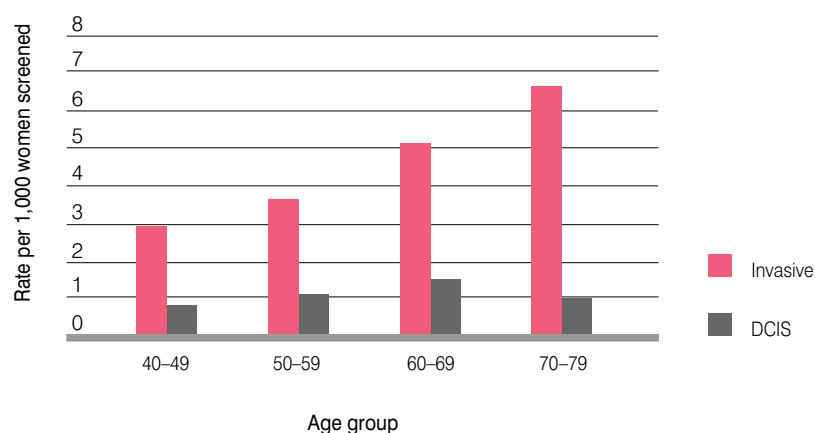
Figure 10: Invasive breast cancer and DCIS detection rate by age

Table 31 shows invasive breast cancer diagnoses by histologic type and size. The distribution is very similar to that reported in previous years.

Table 31: Invasive breast cancer diagnosis by size and histologic type

Histologic type	0-10 mm	11-15 mm	Invasive >15 mm	Unknown	Total
Invasive ductal carcinoma not otherwise stated	236 37.1%	170 26.7%	216 34.0%	14 2.2%	636 100%
Lobular classical carcinoma	17 21.8%	16 20.5%	41 52.6%	4 5.1%	78 100%
Mixed ductal/lobular carcinoma	16 33.3%	11 22.9%	20 41.7%	1 2.1%	48 100%
Tubular carcinoma	26 66.7%	8 20.5%	4 10.3%	1 2.6%	39 100%
Mucinous carcinoma	5 38.5%	4 30.8%	4 30.8%	0 0.0%	13 100%
Lobular variant carcinoma	2 18.2%	6 54.5%	3 27.3%	0 0.0%	11 100%
Other	5 26.3%	3 15.8%	7 36.8%	4 21.1%	19 100%
Total	307 36.4%	218 25.8%	295 35.0%	24 2.8%	844 100%

Tumour grade

Information about tumour grade was known for 96% of the 844 women diagnosed with invasive breast cancer. Table 32 shows the tumour grade by size. Tumour grade is an important prognostic indicator. Tumours that are well differentiated (Grade 1) are associated with a better prognosis.

Table 32: Invasive breast cancer by tumour grade and size

Tumour grade	0–10 mm	11–15 mm	Invasive >15 mm	Unknown	Total
Grades unknown	14	4	7	10	35
Grades known					
Well differentiated	126 43.0%	76 35.5%	58 20.1%	3 21.4%	263 32.5%
Moderately differentiated	130 44.4%	101 47.2%	161 55.9%	9 64.3%	401 49.6%
Poorly differentiated	37 12.6%	37 17.3%	69 24.0%	2 14.3%	145 17.9%
Subtotal	293 100%	214 100%	288 100%	14 100%	809 100%

Interval cancer rate

Interval cancers are cases of invasive breast cancer that are diagnosed during the time interval after a negative screen and prior to the next scheduled screening examination. This period is usually 24 months.

The following points are relevant to the interval cancer rates that are presented in Tables 33 and 34.

- The interval cancer rates in the tables relate to women screened at BreastScreen Victoria from 1 January 1999 to 31 December 1999.³⁴
- Interval cancer rates are calculated separately for women who were first round attenders in 1999 and for women who were subsequent attenders in 1999.
- Within each table, separate rates are presented for three groups of women:
 - women who were asymptomatic at the time of their 1999 screening
 - women who indicated a breast lump and/or a bloodstained or watery nipple discharge at the time of their 1999 screening
 - women who indicated ‘other’ breast symptoms³⁵ at the time of their 1999 screening.

These rates are presented separately as it is expected that the interval cancer rate will differ between women who were symptomatic and asymptomatic at the time of screening.

Interval cancer rates are reported using the national definition endorsed by the BreastScreen Australia National Advisory Committee in November 1998.³⁶ The national definition excludes DCIS for reporting purposes, and corresponds with that used in the BreastScreen Victoria 1999 and 2000 Annual Statistical Reports.

³⁴ Measurement of interval cancer rates is made possible by the generous assistance of the staff of the Cancer Epidemiology Centre at The Cancer Council Victoria.

³⁵ The category ‘other breast symptoms’ includes a variety of symptoms, particularly breast pain or tenderness.

³⁶ Kavanagh AM, Amos AF and Marr GM (1999), *The Ascertainment and Reporting of Interval Cancers within the BreastScreen Australia Program*, NHMRC National Breast Cancer Centre.

A total of 61 interval cancers were identified among the first round attenders in 1999. Of these, 26 were diagnosed during the first year and 35 during the second year. Table 33 shows the interval cancer rate for the three groups of first attenders during the first and second years after their 1999 screening.

Table 33: Interval cancer rate by age and symptom status for women who were first attenders in 1999

Year after screening	Age group					50–69	Total Av. rate (95% C.I.)
	40–49	50–59	60–69	70–79	80+		
Year 1							
Asymptomatic women							
Number of women years at risk	9795	14961	3242	1387	255	18203	29640
Number of interval cancers	10	10	1	1	1	11	23
Rate per 10,000 women years	10.2	6.7	3.1	7.2	39.2	6.0	7.8 (4.9–11.6)
Symptoms – lump or discharge							
Number of women years at risk	505	419	65	33	8	484	1030
Number of interval cancers	1	0	0	0	0	0	1
Rate per 10,000 women years	19.8	0.0	0.0	0.0	0.0	0.0	9.7 (0.2–54.0)
Symptoms – ‘other’							
Number of women years at risk	720	716	171	104	32	887	1743
Number of interval cancers	0	1	1	0	0	2	2
Rate per 10,000 women years	0.0	14.0	58.5	0.0	0.0	22.5	11.5 (1.4–41.4)
Year 2							
Asymptomatic women							
Number of women years at risk	9790	14943	3239	1384	255	18182	29611
Number of interval cancers	9	16	7	2	0	23	34
Rate per 10,000 women years	9.2	10.7	21.6	14.5	0.0	12.6	11.5 (8.0–16.0)
Symptoms – lump or discharge							
Number of women years at risk	505	419	65	33	8	484	1030
Number of interval cancers	1	0	0	0	0	0	1
Rate per 10,000 women years	19.8	0.0	0.0	0.0	0.0	0.0	9.7 (0.2–54.0)
Symptoms – ‘other’							
Number of women years at risk	720	716	171	104	31	887	1742
Number of interval cancers	0	0	0	0	0	0	0
Rate per 10,000 women years	0.0	0.0	0.0	0.0	0.0	0.0	0.0 (0–0)

Among asymptomatic first round attenders aged 50–69 years in 1999, 11 invasive breast cancers were diagnosed during the first 12 months after screening, giving an interval cancer rate of 6.0 cancers per 10,000 women (95% C.I. 3.3–10.9). During the second year after the 1999 screening, 23 invasive breast cancers were diagnosed among asymptomatic first round attenders aged 50–69 years, giving an interval cancer rate of 12.6 cancers per 10,000 women (95% C.I. 8.4–19.0).

A total of 271 interval cancers were identified among subsequent attenders in 1999. Of these, 90 were diagnosed during the first year and 181 during the second year.

Table 34 shows the interval cancer rate for the three groups of subsequent attenders during the first and second years after their 1999 screening. As in Table 33, the interval cancer rate among asymptomatic women during the second year after screening was two times that found during the first year after screening.

Table 34: Interval cancer rate by age and symptom status for women who were subsequent attenders in 1999

Year after screening	Age group					50–69	Total Av. rate (95% C.I.)
	40–49	50–59	60–69	70–79	80+		
Year 1							
Asymptomatic women							
Number of women years at risk	5658	58683	46102	20983	440	104785	131866
Number of interval cancers	2	38	29	10	0	67	79
Rate per 10,000 women years	3.5	6.5	6.3	4.8	0.0	6.4	6.0 (4.7–7.5)
Symptoms – lump or discharge							
Number of women years at risk	251	1122	477	175	10	1599	2035
Number of interval cancers	0	1	2	0	0	3	3
Rate per 10,000 women years	0.0	8.9	41.9	0.0	0.0	18.8	14.7 (3.0–43.0)
Symptoms – 'other'							
Number of women years at risk	376	1949	1216	463	38	3165	4042
Number of interval cancers	0	4	3	1	0	7	8
Rate per 10,000 women years	0.0	20.5	24.7	21.6	0.0	22.1	19.8 (8.5–39.0)
Year 2							
Asymptomatic women							
Number of women years at risk	5642	58588	46023	20947	435	104611	131635
Number of interval cancers	8	71	68	21	0	139	168
Rate per 10,000 women years	14.2	12.1	14.8	10.0	0.0	13.3	12.8 (10.1–14.8)
Symptoms – lump or discharge							
Number of women years at risk	249	1117	473	174	10	1590	2023
Number of interval cancers	1	2	0	0	1	2	4
Rate per 10,000 women years	40.2	17.9	0.0	0.0	1000.0	12.6	19.8 (5.4–50.5)
Symptoms – 'other'							
Number of women years at risk	375	1942	1212	463	38	3154	4030
Number of interval cancers	1	5	2	1	0	7	9
Rate per 10,000 women years	26.7	25.7	16.5	21.6	0.0	22.2	22.3 (10.2–42.4)

Among asymptomatic subsequent round attenders aged 50–69 years in 1999, 67 invasive breast cancers were diagnosed during the first 12 months after screening, giving an interval cancer rate of 6.4 cancers per 10,000 women (95% C.I. 5.0–8.1). During the second year after the 1999 screening, 139 invasive breast cancers were diagnosed among asymptomatic subsequent round attenders aged 50–69 years, giving an interval cancer rate of 13.3 cancers per 10,000 women (95% C.I. 11.3–15.7).

The national accreditation standard is that less than 6 per 10,000 women screened are diagnosed with breast cancer (including DCIS but excluding LCIS) in the 12 months following screening. There is currently no national accreditation standard for interval cancers diagnosed in the 12 to 24 month period following screening. The new standard implemented in 2002 has been revised to reflect the change in the national definition of interval cancers.

Breast cancer treatment

Nodal status

Table 35 shows nodal status by tumour type and size. Fewer than 7% of the 844 women diagnosed with invasive breast cancer did not undergo axillary node dissection, compared with 9% in 2000 and 10% in both 1999 and 1998. Among those women who had an axillary node dissection, nodes were positive for 10.3% of the women whose breast cancer was 10 mm or less in diameter, for 17.9% of the women whose breast cancer was 11–15 mm in diameter, and for 38.5% of the women whose breast cancer was more than 15 mm in diameter.

Ten per cent of the 220 women diagnosed with ductal carcinoma in situ (DCIS) underwent axillary node dissection, compared with 7% in 2000, 10% in 1999 and 1998, 20% in 1997 and 22% in 1996. As in previous years, all women with DCIS who underwent axillary dissection were node negative.

Table 35: Nodal status for invasive breast cancer (by size) and for DCIS

Nodal status	Invasive				Invasive total	DCIS	Total
	0–10 mm	11–15 mm	>15 mm	Unknown			
No dissection	35	6	4	11	56	198	254
Dissection performed							
Node negative	241 88.6%	173 81.6%	179 61.5%	8 61.5%	601 76.3%	21 95.5%	622 76.8%
Node positive	28 10.3%	38 17.9%	112 38.5%	5 38.5%	183 23.2%	0 0.0%	183 22.6%
Nodes unknown	3 1.2%	1 0.6%	0 0.0%	0 0.0%	4 0.7%	1 4.5%	5 0.8%
Subtotal	272 100%	212 100%	291 100%	13 100%	788 100%	22 100%	810 100%

Surgical treatment

Treatment details were recorded for all but two women who were diagnosed with invasive breast cancer. The percentage of women who underwent breast conservation surgery (76%) is similar to 2000 (76%) and 1999 (77%) and higher than in previous years (73% in 1998 and 1997, and 65% in 1996). Treatment details were recorded for all of the women who were diagnosed with DCIS. Sixteen per cent of these women underwent a mastectomy compared with 19% in 2000, 20% in 1999, 18% in 1998, 22% in 1997 and 30% in 1996.

Table 36: Surgical treatment for invasive breast cancer (by size) and for DCIS

Type of surgical treatment	Invasive				Invasive total	DCIS	Total
	0–10 mm	11–15 mm	>15 mm	Unknown			
Unknown	0 0.0%	0 0.0%	0 0.0%	2 9.1%	2 0.2%	0 0.0%	2 0.2%
Information available							
No surgery	1 0.3%	0 0.0%	0 0.0%	9 40.9%	10 1.2%	2 0.9%	12 1.1%
Local diagnostic excision	8 2.6%	1 0.5%	4 1.4%	0 0.0%	13 1.5%	21 9.5%	34 3.2%
Wide local excision	243 79.2%	184 84.4%	188 63.7%	9 40.9%	624 74.1%	161 73.2%	785 73.9%
Mastectomy	55 17.9%	33 15.1%	103 34.9%	4 18.2%	195 23.2%	36 16.4%	231 21.8%
Subtotal	307 100%	218 100%	295 100%	22 100%	842 100%	220 100%	1062 100%

The majority of women (74%) with a diagnosis of invasive cancer or DCIS underwent a wide local excision.

Of the 844 cases of invasive breast cancer, 633 (75%) were diagnosed among women living in urban³⁷ areas and 211 (25%) among women living in rural³⁸ areas. Of the 220 cases of DCIS, 168 (76%) were diagnosed among women living in urban areas and 52 (24%) were diagnosed among women living in rural areas.

Table 37 shows surgical treatment by area of residence. A greater proportion of women living in rural areas (32%) underwent mastectomy than women living in urban areas (18%). Comparative rates for 2000 were rural (37%) and urban (20%); and for 1999 the rates were rural (40%) and urban (17%).

Table 37: Surgical treatment for invasive breast cancer (by size) and for DCIS by area of residence

Area of residence	Invasive				Invasive total	DCIS	Total
	0–10 mm	11–15 mm	>15 mm	Unknown			
Urban							
Unknown	0 0.0%	0 0.0%	0 0.0%	1 6.7%	1 0.2%	0 0.0%	1 0.1%
Information available							
No surgery	1 0.4%	0 0.0%	0 0.0%	7 46.7%	8 1.3%	2 1.2%	10 1.3%
Local diagnostic excision	7 3.0%	0 0.0%	4 1.8%	0 0.0%	11 1.7%	13 7.7%	24 3.0%
Wide local excision	192 82.4%	139 85.8%	152 68.5%	6 40.0%	489 77.4%	130 77.4%	619 77.4%
Mastectomy	33 14.2%	23 14.2%	66 29.7%	2 13.3%	124 19.6%	23 13.7%	147 18.4%
Subtotal	233 100%	162 100%	222 100%	15 100%	632 100%	168 100%	800 100%
Rural							
Unknown	0 0.0%	0 0.0%	0 0.0%	1 14.3%	1 0.5%	0 0.0%	1 0.4%
Information available							
No surgery	0 0.0%	0 0.0%	0 0.0%	2 28.6%	2 1.0%	0 0.0%	2 0.8%
Local diagnostic excision	1 1.4%	1 1.8%	0 0.0%	0 0.0%	2 1.0%	8 15.4%	10 3.8%
Wide local excision	51 68.9%	45 80.4%	36 49.3%	3 42.9%	135 64.3%	31 59.6%	166 63.4%
Mastectomy	22 29.7%	10 17.9%	37 50.7%	2 28.6%	71 33.8%	13 25.0%	84 32.1%
Subtotal	74 100%	56 100%	73 100%	7 100%	210 100%	52 100%	262 100%

37 References to 'urban' include capital city and other major urban according to the 'Rural/Remote Areas Classification' of the Commonwealth Department of Health and Family Services, January 1994.

38 References to 'rural' include rural major, rural other, remote major and remote other according to the 'Rural/Remote Areas Classification' of the Commonwealth Department of Health and Family Services, January 1994.

Adjuvant therapy

Information about the use of adjuvant therapy was available for 91% of the 1,064 women who were diagnosed with breast cancer. Adjuvant therapy is given in addition to the primary treatment (usually surgery) to try to destroy any remaining cancer cells. Radiotherapy, chemotherapy and hormonal therapy may be used as adjuvant therapy.

Among those women with known information, 86% of women with breast cancer received some type of adjuvant therapy. Among women with invasive breast cancer, 95% received adjuvant therapy. These proportions are the same as for women diagnosed in 2000. Table 38 shows the range of adjuvant therapy used for women with invasive breast cancer of known size.

Table 38: Adjuvant therapy for invasive breast cancer by size

Type of adjuvant therapy	0–10 mm	Invasive 11–15 mm	>15 mm
Unknown	26	17	25
Information available			
No adjuvant therapy	18 6.4%	2 1.0%	13 4.8%
Radiotherapy only	44 15.7%	32 15.9%	16 5.9%
Chemotherapy only	5 1.8%	8 4.0%	21 7.8%
Hormonal therapy only	69 24.6%	25 12.4%	45 16.7%
Radiotherapy & hormonal therapy	121 43.1%	92 45.8%	74 27.4%
Radiotherapy & chemotherapy	12 4.3%	18 9.0%	43 15.9%
Chemotherapy & hormonal therapy	3 1.1%	3 1.5%	13 4.8%
Radiotherapy & chemotherapy & hormonal therapy	9 3.2%	21 10.4%	45 16.7%
Subtotal	281 100%	201 100%	270 100%

Of the women diagnosed with DCIS, 50% received adjuvant therapy, compared with 47% in 2000, 41% in 1999, 29% in 1998 and 27% in 1997. Of the 199 women with DCIS for whom information about the use of adjuvant therapy was available, 69 (35%) received radiotherapy alone, 17 (8%) received hormonal therapy, 14 (7%) received a combination of radiotherapy and hormonal therapy, and 99 (50%) received no adjuvant therapy.

Table 39 shows the use of radiotherapy for women with invasive cancer and known nodal status who underwent breast conservation surgery or mastectomy.³⁹ The majority of women who underwent breast conservation surgery received adjuvant radiotherapy: 94% of women with node positive breast cancer (91% in 2000, 82% in 1999, 93% in 1998) and 86% of women with node negative breast cancer (87% in 2000, 78% in 1999, 73% in 1998). Most women (78%) who underwent a mastectomy did not receive radiotherapy.

Table 39: Adjuvant radiotherapy for invasive breast cancer by type of surgery and nodal status

Adjuvant radiotherapy	Invasive			
	Breast conservation surgery Node positive	Breast conservation surgery Node negative	Mastectomy Node positive	Mastectomy Node negative
Unknown	8	34	9	17
Information available				
Radiotherapy	96 94.1%	386 85.8%	26 41.3%	10 10.0%
No radiotherapy	6 5.9%	64 14.2%	37 58.7%	90 90.0%
Subtotal	102 100%	450 100%	63 100%	100 100%

Table 40 shows the use of radiotherapy for women with invasive cancer of known size who underwent breast conservation surgery.⁴⁰ Eighty-four per cent of these women received radiotherapy. Of women with tumours 11 mm or greater in diameter, 90% underwent radiotherapy (89% in 2000, 86% in 1999, 79% in 1998) as opposed to 75% of women with tumours 10 mm or less in diameter (78% in 2000, 64% in 1999, 68% in 1998).

Table 40: Adjuvant radiotherapy for invasive breast cancer treated with breast conservation surgery by size

Adjuvant radiotherapy	Invasive			Total
	0–10 mm	11–15 mm	>15 mm	
Unknown	16	12	15	43
Information available				
Radiotherapy	177 75.3%	159 91.9%	155 87.6%	491 83.9%
No radiotherapy	58 24.7%	14 8.1%	22 12.4%	94 16.1%
Subtotal	235 100%	173 100%	177 100%	585 100%

³⁹ These women may or may not have had systemic therapy in addition to radiotherapy.

⁴⁰ As in footnote 39.

Table 41 shows systemic adjuvant therapy for women with invasive breast cancer and known nodal status by age group.⁴¹ The age groups given are used to approximate menopausal status, 50 years or less for pre-menopause and more than 50 years for post-menopause.⁴² Almost all women had some form of systemic adjuvant therapy.

Table 41: Systemic adjuvant therapy for invasive breast cancer by age and nodal status

Systemic adjuvant therapy	Node positive		Node negative	
	≤ 50 years	> 50 years	≤ 50 years	> 50 years
Unknown	1	17	2	49
Information available				
No systemic	1 7.1%	0 0.0%	1 2.0%	24 5.7%
Chemotherapy	7 50.0%	42 29.0%	15 30.0%	46 11.0%
Hormonal therapy	1 7.1%	51 35.2%	24 48.0%	323 76.9%
Chemotherapy & hormonal therapy	5 35.7%	52 35.9%	10 20.0%	27 6.4%
Subtotal	14 100%	145 100%	50 100%	420 100%

41 These women may or may not have had radiotherapy in addition to systemic therapy. Table excludes women who had radiotherapy only.

42 This is likely to be inaccurate; however, no other measure of menopausal status is currently available.

Appendix

Performance against national accreditation standards in 2001

Minimum standards and requirements are in place for accredited services operating within BreastScreen Australia. Notwithstanding present limitations of the data, this Appendix summarises the performance of BreastScreen Victoria for a selection of standards measurable using the information in this report.⁴³

Appendix: Performance against national accreditation standards

Standard	Performance objective	Minimum standard	BreastScreen Victoria
1.2	To maximise the number of women screened who are aged 50–69 years with the aim of screening 70% of this group.	Participation by 60% of the target group (50–69) after five years in the Program. ⁴⁴	Standard achieved. 60.2% of eligible Victorian women aged 50–69 years were screened during the 24 months from 1 January 2000 to 31 December 2001. This is an improvement on the rate of 58.9% in 2000.
1.3	To maximise participation by women of non-English-speaking background.	Participation for women of non-English-speaking background in urban areas will be at least 50% of the rate for the general population.	Standard achieved. Participation across Victoria of women aged 50–69 years who usually speak a language other than English at home was 95% of the rate for all Victorian women. ⁴⁵
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.	Standard not achieved. Assessment was recommended for 10.6% of women attending for first screens and 4.8% of subsequent attenders. If confined to women recommended for assessment on the basis of abnormal mammography only, the percentages are 8.6% for first attenders and 3.9% for subsequent attenders. ⁴⁶
2.23	To maximise the number of cancers detected.	> 5 cancers per 1,000 screened women should be detected at the prevalent screening round. At incident rounds, at least 2 cancers per 1,000 screened women should be detected.	Standard achieved. The average rate of breast cancer diagnosis ⁴⁷ was 7.3 per 1,000 among first attenders and 4.8 per 1,000 among subsequent attenders.
2.24	To maximise the number of minimal invasive cancers detected.	> 0.8 cancers per 1,000 screened women will have a diameter of ≤ 10 mm.	Standard achieved. The average rate of cancers 10 mm or less in diameter was 1.6 per 1,000 women screened.
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.	Standard not achieved. 22% of cancers detected in first attenders were DCIS.
2.26	To minimise the number of interval cancers.	< 6 per 10,000 screened women develop breast cancer (including DCIS but excluding LCIS) in the 12 months following screening.	Standard not achieved. Average rate of interval cancers for women aged 50–69 years was 6.6 per 10,000 among first attenders and 7.0 per 10,000 among subsequent attenders during the first 12 months after screening. ⁴⁸

43 For screening conducted in 2001, the 1994 National Accreditation Requirements apply (National Program for the Early Detection of Breast Cancer [1994], *National Accreditation Requirements – March 1994*, Canberra: Commonwealth Department of Human Services and Health) and are presented in this report.

44 This standard applies only to screening and assessment services established for five years and granted full accreditation. 2001 was the first year in which all eight BreastScreen Victoria assessment services had been operating for five years.

45 Census 2001 counts are being compared with an average of Estimated Resident Population 2000–2001 counts.

46 Data by prevalent and incident screening round, as distinct from first and subsequent attendance, are not used in this publication.

47 Rates given are for asymptomatic women with no personal history of breast cancer.

48 This rate is given for all women screened, asymptomatic and symptomatic at the time of screening, and excludes cases of DCIS.

BreastScreen Victoria
Board of Management
Research and Evaluation
Annual Report
October 2001 – September 2002

This Research and Evaluation Annual Report outlines the studies that were endorsed by BreastScreen Victoria's Research and Evaluation Committee between October 2001 and September 2002.

The Victorian Program continues to attract interest from researchers because of its comprehensive data collection, spanning more than a decade of Program activity and over 1.4 million screens. The data set covers all aspects of screening and includes demographic details, screening and assessment activity, outcomes, pathology and histology details, and treatment. Research within BreastScreen Victoria has ranged from larger, statewide studies to smaller analyses of work within an individual service.

BreastScreen Victoria's Board of Management has established a committee to which all research proposals are directed. As a previous Chair of the Research and Evaluation Committee has said, its role is 'to encourage high quality research and evaluation that contributes to the effectiveness and quality of the BreastScreen Program as well as improving understanding of breast cancer'. The members have a wide range of expertise, including epidemiology, social and behavioural science, ethics, service provision and consumer issues.

Research done within BreastScreen Victoria is often relevant to other screening programs, as reflected by the publication in the peer-reviewed literature of over forty articles based on BreastScreen Victoria data or experience since the pilot Program began in the late eighties. There have also been many conference presentations in specialties such as radiology, radiography, surgery, health promotion and health services quality. As Professor Sally Redman has noted, 'Research using BreastScreen Victoria data has made a significant contribution to the international literature on breast cancer screening.'¹

BreastScreen Victoria does not fund research initiatives, but we are committed to working collaboratively with investigators. We welcome approaches from researchers who have an interest in breast cancer screening.

¹ *A Decade of Achievement: BreastScreen Victoria 1992–2002*, p 7. Professor Redman is the past Chair of BreastScreen Australia's National Advisory Committee.

1 Research and evaluation project notifications

Titles, authors, the institution of the principal investigator and a brief outline are listed below for research and evaluation studies endorsed by the BreastScreen Victoria Research and Evaluation Committee between October 2001 and September 2002.

November 2001

1.1 Comparison of the accuracy of double reading versus one reader plus computer aided diagnosis (CAD).

Cawson J, Amos A, Kavanagh A. St Vincent's BreastScreen, Melbourne.

Computer aided diagnosis (CAD) has a reported sensitivity of 96% for calcifications and 85% for soft tissue masses compared with an experienced radiologist reader. This study aims to compare the results of double reading with the results of each of them using single reading and CAD. The sample size of the study has the power to detect a 5% reduction in sensitivity of one reader using CAD compared with double reading.

The two readers will be (i) highly experienced or (ii) inexperienced. Each reader will read serial batches of films containing a mixture of normal and screen-detected cancers in the ratio of 10 to 1. The readers will record their opinions before and after using CAD. The accuracy of double reading without CAD will be compared with the accuracy of each reader using CAD.

1.2 Longitudinal study of mammographic density: relationship to age, parity, hormonal and lifestyle factors during the menopause transition. Dennerstein L, Hopper J, Guthrie J, Dite G, Cawson J. Office for Gender and Health, University of Melbourne.

Mammographic density is known to be a major predictor of breast cancer. Women who have dense breasts for their age are three to five times more likely to develop breast cancer. It is therefore important to understand the lifestyle, dietary, reproductive and hormonal determinants of breast density. Studying these relationships during the menopausal transition, when there are dramatic changes in hormone levels, will provide knowledge about the role of a number of factors in increasing or decreasing the risk of breast cancer (using mammographic density as a surrogate marker).

The aims of this study are: (i) to measure prospectively changes in mammographic density during the menopausal transition; (ii) to determine the variables associated with mammographic density; (iii) to assess the determinants of changes in mammographic density as women move through the menopausal transition.

1.3 The incidence of breast cancer and tumour size and stage, relative to screening for women aged 69 years.

Erbas B, Gertig D. Centre for Genetic Epidemiology, University of Melbourne.

The frequency with which to screen women aged 69 years is controversial and based on limited evidence. Current research shows that older women continue to be underscreened, which may result in undetected breast cancers. In fact, the screening behaviours and benefits for older women have not been well studied within Australia. We propose to analyse existing BreastScreen Victoria data on all women screened in BreastScreen Victoria between 1993 and 1999 to explore the influence of the time-dependent process from repeated screening on different outcome measures.

The time-dependent processes that arise from multiple routine screening mammograms are complex and are yet to be addressed adequately. An important issue is the random time-dependent process from repeated screening, and modelling this with respect to: (i) incidence of breast cancer; (ii) tumour size; and (iii) stage of cancer in older women. This study will contribute to the limited literature on the effects of different screening intervals on breast cancer among older women undergoing mammographic screening. The findings from this study will be directly relevant to BreastScreen Victoria policy regarding frequency of screening in older women.

1.4 Surgical biopsy alive and well. Rose A. North Western BreastScreen, Victoria.

We intend to retrospectively review 125 files of women proceeding to surgical biopsy; identify the reasons for referral for surgical diagnostic biopsy; and identify possible areas where reductions in referrals can be achieved.

February 2002

1.5 Determinants of mastectomy and determinants of survival in women diagnosed with breast cancer within BreastScreen Victoria. Fletcher A, Gertig D, Rodger A, Hart S. Centre for Genetic Epidemiology, University of Melbourne.

The use of breast conserving surgery (BCS) has been increasing steadily since the 1980s and has been shown to be as effective as mastectomy in the management of early breast cancer. The use of BCS in Victoria increased from 23% in 1986 to 54% in 1995, when guidelines on the management of early breast cancer in Victoria were published. Of the women diagnosed within BreastScreen Victoria in 1998, 73% were treated with BCS. The rate of mastectomy in rural communities was double that of urban residents irrespective of tumour size, and was almost three times more for small tumours (0–10 mm). This analysis will investigate predictors of breast cancer management, and adjust for tumour staging and pathology as well as other confounding factors.

Within BreastScreen Victoria there have been over 280 deaths in women diagnosed with breast cancer in the period 1993 to 2001. We will analyse survival (breast cancer specific and all-cause) of women diagnosed with breast cancer in BreastScreen Victoria, in particular to determine survival by hormone replacement therapy (HRT) use, adjusting for treatment and tumour staging. Use of HRT before the diagnosis of breast cancer is associated with a better prognosis including reduced mortality. This may be explained by two factors, better surveillance in HRT users and biological differences in the cancer of HRT users compared with that of non-users.

1.6 Review of needle localisation breast biopsies (NLBB) in a Victorian practice. Morgan J, Cawson J, Henderson M. St Vincent's BreastScreen, Melbourne.

Needle localisation breast biopsy (NLBB) has been practised since 1965. Improved radiographic technology and screening mammography of asymptomatic women have increased the detection of impalpable mass lesions and microcalcifications amenable to NLBB. Successful NLBB requires accurate needle placement by a specially trained radiologist, good quality surgery and an experienced pathologist.

The extent of surgery is determined by pre-operative diagnosis. A malignant result changes the aim of the surgery from a diagnostic procedure to a definitive procedure with adequate margins. This study is a review of a consecutive series of NLBB of screen-detected lesions by a single surgeon and radiologist.

July 2002

1.7 Five-year follow-up of screen-detected breast cancer. Sacco G, Bettio J, Hart S. Monash BreastScreen, Victoria.

This is a five-year follow-up of BreastScreen-detected breast cancer cases in 1993–1994. Recurrence rates, local and systemic, will be documented.

1.8 Evaluation of the cost-effectiveness of directional vacuum-assisted breast biopsy. Haas M, Ivancic L. Centre for Health Economics Research and Evaluation, University of Technology, NSW.

The primary objective of this study is to determine the relative cost-effectiveness of directional vacuum-assisted breast biopsy when compared with core biopsy for calcification lesions. Further objectives include conducting a thorough review of the international literature to determine the current state of knowledge concerning this technology, with a particular reference to the effectiveness and cost-effectiveness of this technology.

2 Oral presentations

2.1 Comparison of the accuracy of double reading versus one reader plus computer aided diagnosis (CAD).

Cawson J, Kavanagh A, Amos A, Hill G, Whan A. 4th Scientific Meeting, Breast Imaging Group, Royal Australian and New Zealand College of Radiologists, Noosa, September 2002.

Background: Computer aided diagnosis (CAD) has a reported sensitivity of 96% for calcifications and 85% for soft tissue masses compared with an experienced radiologist reader. The hypothesis is that the sensitivity of screening mammography can be increased by the use of CAD.

Objective: To determine whether a single reader with the aid of computer aided diagnosis can achieve a similar sensitivity to the results of independent double reading by two radiologists.

Methods: There were 1,570 mammograms containing 157 proven breast cancers, a mixture of normal mammograms and screen-detected cancers in the ratio of 9 to 1. The sample size of the study was chosen to have the power to detect a 5% reduction in sensitivity of one reader using CAD compared with double reading. The breast cancers were a mixture of lesions detected by two readers (70%) and one reader (30%).

Two readers blinded to the proportion of cancers and normals read serial batches of films. The readers recorded their opinions before and after using CAD. The accuracy (cancer detection rate) of double reading without CAD was compared with the accuracy of each reader using CAD.

A verification exercise was carried out by an independent reader to determine: (i) whether the breast cancer had been detected by CAD; and (ii) that the lesions recalled by each reader corresponded to the breast cancer.

Results: The CAD system marked 146 of the 157 cancers (93%). It was slightly more accurate than either individual reader at detecting the more subtle cancers (39 of 47 compared with 29 and 38 of 47).

Reader 1 recalled 133 of 157 cancers prior to using CAD (85%) and another 3 cancers after using CAD (total 87%).

Reader 2 recalled 146 of 157 cancers prior to using CAD (93%) and another 4 cancers after using CAD (96%).

Double reading followed by a consensus decision for discordant readings led to 141 of the 157 cancers being recalled (90%).

7 cancers recalled by one reader were cleared at consensus, and 12 were recalled.

Conclusion: The use of CAD led to a small increase in sensitivity for both readers (2% and 3%).

There is similar sensitivity for double reading (plus consensus for discordant reads) and for each individual reader with CAD, with a statistically non-significant difference in outcomes.

2.2 Stereotactic needle core biopsy of radial scars: is surgical excision biopsy necessary?

Cawson J, Malara F, Kavanagh A, Hill P, Balasubramaniam G, Henderson M. 4th Scientific Meeting, Breast Imaging Group, Royal Australian and New Zealand College of Radiologists, Noosa, September 2002.

Background: Radial scar is a benign lesion which may mimic breast cancer on mammography and is usually managed by excision biopsy. We report our experience with stereotactic needle core biopsy (SNCB) in sampling these lesions.

Methods: A prospective study examined a consecutive series of 75 mammographically detected radial scars from a population-based screening program. In cases sampled by SNCB followed by surgical biopsy, the histological findings of core biopsy and the gold standard of excision biopsy were compared.

Results: Sixty-three cases were sampled by core biopsy, 55 (87.0%) using SNCB and 8 (13%) with ultrasound-guided needle core biopsy (UNCB). One SNCB case did not have follow-up excision biopsy. Radial scar was diagnosed pre-operatively by core biopsy in 51 of the 62 excised cases, i.e. 82% (95% CI 70–91%). The sensitivity for SNCB was 85% (95% CI 73–94%) and for UNCB was 63%

(95% CI 25–91%). Of the 54 excised SNCB cases, 4 had co-existent ductal carcinoma in situ (DCIS) at surgical excision, of which SNCB identified DCIS in one case and atypical ductal hyperplasia (ADH) in 3.

In the entire group of 75 radial scars there were 5 cases with associated DCIS (7%), and no invasive carcinomas. ADH was present in association with 42 of the 74 radial scars surgically excised (57%). Twenty-nine of these were pre-operatively sampled by SNCB. ADH was found in 21 cases, i.e. 72% (95% CI 53–87%).

Conclusion: The sensitivity of SNCB in identification of radial scars was 85%. In four cases with associated DCIS, SNCB revealed either ADH or DCIS, which both require excision. These findings suggest that SNCB-proven radial scars in a screened population can be safely managed by mammographic follow-up, provided there is no associated DCIS, ADH or lobular carcinoma in situ (LCIS). Spiculated abnormalities with discordant SNCB results require surgical biopsy.

2.3 A review of false negatives at assessment in the St Vincent's BreastScreen Program. Bronwnlee R, Cawson J. 4th Scientific Meeting, Breast Imaging Group, Royal Australian and New Zealand College of Radiologists, Noosa, September 2002.

From September 1993 to March 2001 St Vincent's BreastScreen (Victoria) performed 211,241 screening examinations. Of these, 11,911 women were recalled for assessment (5.6%). During this period the cancer detection rate was 6.2 per 1,000 screened (a mixture of prevalent and incident screens). Of the 11,911 recalled, 3,451 needle biopsies were performed (29.0%), a mixture of fine needle and core biopsies.

Eight hundred and twenty-seven (6.9%) of those recalled had further review, mostly at six months. Twenty-six cancers were diagnosed among the 827 who were reviewed (3.1%). A further 42 women of the 11,911 who had attended recall clinics were classified as interval cancers by direct notification and/or through the Victorian Cancer Registry (0.35%). Review of work-up films of these 42 was undertaken with knowledge of the diagnosis, and where possible with the films at time of diagnosis.

This review suggested that 26 women were true interval cancers (26 per 11,911 = 0.22%), and 16 had work-up that was thought to be benign or normal, but with hindsight may have been in error. Adding these 16 to the 26 found at early review gives a total of 42 women in 11,911 recalled (0.35%) who had delayed diagnosis.

At the time of the investigation, the interval cancers of the women recalled in the last year were not at hand and these cases will need to be added into the intervals during subsequent evaluation.

An analysis of the cancers missed, and the implications of this for assessment practice, will be discussed.

2.4 HRT use and survival after breast cancer. Fletcher A, Erbas B, Kavanagh A, Hart S, Rodger A, Gertig D. Department of Public Health, University of Melbourne. 11th Annual Scientific Meeting, Australasian Epidemiological Association, Wellington, New Zealand, 5–6 September 2002.

Background: Hormone replacement therapy (HRT) use prior to diagnosis of breast cancer has been associated with a better prognosis. This may be explained by better surveillance or biological differences in tumours of HRT users.

Methods: BreastScreen Victoria routinely links breast cancer diagnoses with the death register. Until April 2002 there had been 215 deaths among 5,301 women diagnosed with screen-detected invasive breast cancers between 1993 and 2002. Personal and tumour characteristics are available for each woman at diagnostic screen. Proportional hazards models were used to evaluate predictors of survival following breast cancer diagnosis among women over 55 years of age.

Results: There were 7 breast cancer deaths among current HRT users (0.84%) compared with 77 deaths among non-users (2.55%), age-adjusted hazard ratio 0.41 (95% CI 0.19–0.90). After adjusting for tumour characteristics and treatment, the hazard ratio was 0.42 (95% CI 0.18–0.99) for current use. For all-cause mortality there were 16 deaths in current HRT users (1.92%) compared with 163 deaths among non-users (5.41%), multivariate hazard ratio 0.43 (95% CI 0.24–0.79).

Conclusion: HRT users at the time of breast cancer diagnosis have significantly improved survival from breast cancer and all-causes compared with non-users, which may be due in part to a biological effect of HRT on tumour grade.

3 Posters

- 3.1 **Margins and outcome of screen-detected breast cancer with extensive in situ component.** Kitchen P, Cawson J, Barbetti T, Wilkins P, Henderson M. St Vincent's BreastScreen, Melbourne. College of Surgeons AGM, Adelaide, May 2002.

Background: Extensive in situ component (EIC) exists when ductal carcinoma in situ (DCIS) is present within an invasive tumour to an extent greater than 25% (usually also in the adjacent tissue). After local excision of breast cancer, the presence of EIC has been shown to increase the risk of unsatisfactory margins, of residual tumour, and of intramammary recurrence, but not after complete excision and breast radiation. Margins are positive if microscopically involved, close if DCIS or invasive tumour is seen within 1 mm, and complete if > 1 mm clearance.

Methods: Data and pathology reports on all invasive breast cancer cases detected in 1994 (127) and 1999 (164) at St Vincent's BreastScreen were retrospectively reviewed to examine presence and extent of DCIS and other features such as adequacy of excision. A cohort of the 1994 cases was followed up.

Results: 215 (74%) had in situ foci in or around the invasive tumour and 61 (21%) were EIC positive. The presence of EIC was not related to tumour size or patient age. There were 7 deaths (9%) among 76 of the 1994 cases (followed median 6 years) of whom none was originally EIC positive. Overall, 24% were treated by mastectomy and 76% by local excision, of whom 17 had more than one local excision procedure.

Conclusions: Final margins (invasive disease) were close or involved in 7 (6%) in 1994 and 3 (2%) in 1999 ($P=0.06$), but marginal clearance of in situ disease did not improve. EIC can compromise margins. It requires complete excision and breast radiation or mastectomy.

- 3.2 **What is the role of BreastScreen in relation to the surveillance of women at high risk due to a family history of breast cancer?** Johnston T. 5th Australasian Conference on Familial and Genetic Aspects of Cancer, 'Genes in the Vines', Barossa Valley, SA, 4-6 July 2002.

The BreastScreen Australia Program is a population-based screening program for breast cancer that targets asymptomatic women aged between 50 and 69 years. At the national level, work is underway to develop a policy that addresses the management of women deemed to be at high risk of developing breast cancer due to a family history of the disease. Initial activities have focused on the development and trial of a questionnaire aimed at determining a woman's level of risk based on the closeness of the relative(s) and the age at which breast cancer was diagnosed.

Across the states, there is no uniformity of policy in this area, particularly with regard to recommended screening intervals, which vary between annual and biennial. BreastScreen Victoria is currently undertaking a review of its family history policy. In the context of little definitive evidence and variations in practice and approach, the challenge is to develop a policy that strikes a balance between a number of complex issues. This poster will identify the more salient issues and explore questions surrounding the role of the program in identifying a woman's level of risk and the associated duty of care.

4 Completed studies

'Are you Aboriginal and/or Torres Strait Islander?' Improving data collection at BreastScreen Victoria.

Adams K, Kavanagh A, Guthrie J. National Centre for Epidemiology and Population Health, Australian National University, Australian Capital Territory, and Australian Research Centre in Sex, Health and Society, La Trobe University, Melbourne.

Objective: To evaluate the accuracy of recording Indigenous status of women attending BreastScreen Victoria (BSV). In particular to describe: the practices of data collection, consistency of recording and staff participation in asking women about Indigenous status.

Methods: Best practice guidelines for collecting data on Indigenous status were compared against BSV practices. Two studies were used to evaluate accuracy of recording of Indigenous status at BSV. The first study involved surveying BSV staff about practices of recording Indigenous status. The second study involved an audit to compare women recorded as Indigenous at their last visit to BSV with how they were recorded at their first visit to BSV.

Results: This study demonstrates that current collection of Indigenous status does not comply with best practice recommendations. A significant proportion (34%) of staff were incorrectly identifying women and/or perceived they were prevented (53%) from asking women whether or not they are Indigenous. Furthermore, the consistency of recording of Indigenous status between women's visits to BSV is poor.

Implications: Training for BSV staff to enable correct identification of Indigenous status is recommended. There should be a reduction in numbers of inconsistent recordings of Indigenous status and 'unknown' Indigenous women by assessing the data annually. Engaging the Indigenous community more actively at BSV would improve accountability and feedback on Indigenous data. A Well Women's reference group with relevant Indigenous women from across Victoria could be one way to do this. A holistic approach involving PapScreen would make this more culturally relevant. The findings of this study are likely to be observed in other services where collection of data on Indigenous status occurs.

5 Published papers

Heritability of mammographic density, a risk factor for breast cancer. Boyd N, Dite S, Stone J, Gunasekara A, English D, McCredie M, Giles G, Titchler D, Chiarelli A, Yaffe M, Hopper J. *New England Journal of Medicine* 2002; 347:886–894.

Background: Women with extensive dense breast tissue visible on a mammogram have a risk of breast cancer that is 1.8 to 6.0 times that of a woman of the same age with little or no density. Menopausal status, weight and parity account for 20–30% of the age-adjusted variation in the percentage of dense breast tissue.

Methods: We undertook two studies of twins to determine the proportion of the residual variation in the percentage of density measured by mammography that can be explained by unmeasured additive genetic factors (heritability). A total of 353 pairs of monozygotic twins and 246 pairs of dizygotic twins were recruited from the Australian Twin Registry, and 218 pairs of monozygotic twins and 134 pairs of dizygotic twins were recruited in Canada and the United States. Information on putative determinants of breast density was obtained by questionnaire. Mammograms were digitised, randomly ordered and read by a blinded investigator.

Results: After adjustment for age and measured co-variates, the correlation coefficient for the percentage of dense tissue was 0.61 for monozygotic pairs in Australia, 0.67 for monozygotic pairs in North America, 0.25 for dizygotic pairs in Australia, and 0.27 for dizygotic pairs in North America. According to the classic twin model, heritability (the proportion of variants attributable to additive genetic factors) accounted for 60% of the variation in density (95% CI 54–66) in Australian twins, 67% (95% CI 59–75) in North American twins, and 63% (95% CI 59–67) in all twins studied.

Conclusions: These results show that the population variation in the percentage of dense tissue on mammography at a given age has high heritability. Because mammographic density is associated with an increased risk of breast cancer, finding the genes responsible for this phenotype could be important for understanding the causes of the disease.

BreastScreen Victoria Research and Evaluation Committee

MEMBERS

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CONSULTANTS

To expand the range of expertise available to the R&EC, there are two special consultants to the Committee.

Assoc Prof Damien Jolley	Biostatistics and Epidemiology, School of Health Sciences, Deakin University.
Dr Victoria White	Senior Behavioural Scientist, Centre for Behavioural Research in Cancer, The Cancer Council Victoria.

COMMITTEE SUPPORT

Administrative support to the Research and Evaluation Committee is provided by staff of the BreastScreen Coordination Unit.

Ms Maura Conneely	Research Officer, Coordination Unit, BreastScreen Victoria.
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