

**BreastScreen Aotearoa**  
**MONITORING REPORT No. 10**

**Women screened**  
**between 1 July and 30 September 2001**

**BreastScreen Aotearoa Independent Monitoring Group**  
**Report to the Ministry of Health**

**20 March 2002**

Technical Report No. 38  
Hugh Adam Cancer Epidemiology Unit  
Department of Preventive and Social Medicine  
Dunedin School of Medicine  
University of Otago

## **The BreastScreen Aotearoa Independent Monitoring Group**

The following are members of the BreastScreen Aotearoa Independent Monitoring Group (BSAIMG).

Dr Brian Cox, Public Health Physician

Dr Ann Richardson, Public Health Physician

Dr Jeremy Nicoll, Medical Physicist

Dr Peter Fitzgerald, Pathologist

Mrs Maureen Clements, Medical Radiation Technologist

Associate Professor John Collins, Surgeon

Mrs Christine Rimene, Maori Health Researcher

Dr Anthony Doyle, Radiologist

Mrs Barbara Robson, Consumer Representative

Ms Thelma Brown, Health Evaluator.

Under contract with the Ministry of Health the monitoring group is required to monitor and evaluate aspects of BreastScreen Aotearoa, the national breast-screening programme. The measures of performance assessed by the monitoring group are specified by the Ministry of Health. The list of agreed measures of performance to be included in quarterly and annual monitoring reports to the Ministry of Health is in Appendix A. The monitoring group can also recommend to the Ministry of Health additional monitoring and evaluation that it considers to be required.

The monitoring group received data for this report on November 28, 2001. The draft report was written in January 2002 and was sent to the Ministry of Health on January 23, 2002 for comment.

Technical terms are used throughout the report, and an understanding of these terms is likely to be necessary to interpret some parts of the report.

### **DISCLAIMER**

BSAIMG results within monitoring reports are obtained from the National monitoring data set, which has been received from the National Screening Unit of the Ministry of Health. BSAIMG results are calculated by lead provider and cumulatively for BreastScreen Aotearoa. The monitoring group does not monitor the results for individual women within BreastScreen Aotearoa.

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## **Foreword**

### **BSAIMG Monitoring Process**

Some readers of BSAIMG quarterly monitoring reports are unfamiliar with the process used by BSAIMG to produce these reports. This brief foreword is to describe the process.

Data for each three-month period (quarter) are sent from the six BreastScreen Aotearoa lead providers to the New Zealand Health Information Service of the Ministry of Health (NZHIS). The data are checked at NZHIS, amalgamated into a single file, and sent to BSAIMG. These data are analysed and a draft quarterly report, which includes tables for each performance indicator and explanatory text, is produced by a subgroup of BSAIMG. The draft report is then sent to the National Screening Unit of the Ministry of Health (NSU) and to the six lead providers, for their comment. The six lead providers send their comments on the draft report to the NSU, where they are collated with comments from NSU staff, and sent to the BSAIMG subgroup. These comments, together with the draft report are then sent to all BSAIMG members.

All the BSAIMG members meet to consider the draft report and the comments from lead providers and the NSU, and to decide on the content of the final quarterly report. At least one member of the NSU attends this meeting. Responses to lead provider comments are included in the final quarterly report, or if they do not need to be included in the report, in a letter from the NSU to lead providers. On occasion, members of the NSU have attended a meeting with the BSAIMG subgroup on the day before the full BSAIMG meeting to discuss other issues to do with monitoring of BreastScreen Aotearoa.

## Executive Summary

This quarterly report relates to women screened during 1 July to 30 September 2001, and also includes data on assessment and investigations carried out for these women following their screening mammograms. Cumulative totals since the commencement of the second round of screening on the 1 January 2001 are also included within the report.

In previous quarterly reports, cumulative totals and percentages have been reported for each two-year screening round. At the start of a new screening round (as in Monitoring Report No. 8) the cumulative totals are for three months, and they increase by three months for each subsequent quarterly report until the end of the two-year screening round. In this quarterly report, a 24-month cumulative total for coverage has also been provided. Where appropriate, 95% confidence intervals have also been provided for the first time in this quarterly report. BSAIMG would appreciate comments from users of these quarterly reports on these new additions to the quarterly report.

In this quarter 27,393 women were screened in BreastScreen Aotearoa. This was 9.1% of the eligible women, which is a very good result. To meet the performance indicator for screening, that is 70% of women in each two-year screening round, 8.75% of women should be screened each quarter. The continued improvement in coverage for BreastScreen Aotearoa is very encouraging, and suggests that women in most regions find the programme acceptable, and that most regional identification and invitation processes are effective. However, coverage among Maori and Pacific women remains lower than anticipated in most regions, and this needs to be improved by lead providers and the National Screening Unit of the Ministry of Health.

It is important to note also, that while 9.1% of eligible women were screened overall in BreastScreen Aotearoa, lead provider coverage in this quarter ranged from 7.6% to 10.8%. It is recommended that lead providers who screen fewer than 8.75% of eligible women in each quarter continue to review their identification and invitation procedures. Similarly, the National Screening Unit of the Ministry of Health may wish to review health promotion strategies used by these lead providers.

Most women screened in BreastScreen Aotearoa are now undergoing incidence screening (in other words they have already been screened over the past two years in BreastScreen Aotearoa). As expected, the referral to assessment rate and the false positive rate dropped for these women. Incidence round specificity was greater than 95% for all lead providers.

Fewer women are now undergoing both core needle and FNA procedures at BreastScreen Central. BreastScreen Central has responded well to the earlier recommendation of BSAIMG to reduce the combined use of these procedures.

The timeliness of reporting the results of screening to women also continues to improve. Of the women screened in BreastScreen Aotearoa, 98% received their results within 10 days. The timeliness of assessment procedures and providing results from assessment continues to need improvement.

For the four lead providers with treatment data included in this quarterly report, over 74% of the women with invasive breast cancer detected had no nodal involvement. This is a very encouraging result, and it is consistent with the desirable level set for screening programmes in the European Union, which is that >70% of cancers detected at initial screening should be

node-negative. All four of these lead providers also met the performance indicator of 10-25% of cancers detected being DCIS.

The timeliness of offering treatment continues to need improvement as the indicator was only met for 64.7% of women requiring treatment. Aspects of this are outside the direct control of lead providers, for instance, the availability of radiotherapy services. It is the responsibility of the Ministry of Health and DHB's to ensure that appropriate facilities for diagnosis and treatment are available for screened women. This is one of the ten World Health Organization principles for population screening listed below:

1. The condition should be an important health problem.
2. There should be an accepted treatment for patients with recognised disease.
3. Facilities for diagnosis and treatment should be available.
4. There should be a recognisable latent or early symptomatic stage.
5. There should be a suitable test or examination.
6. The test should be acceptable to the population.
7. The natural history of the condition, including development from latent to declared disease, should be adequately understood.
8. There should be an agreed policy on whom to treat as patients.
9. The cost of case-finding (including diagnosis and treatment of patients diagnosed) should be economically balanced in relation to possible expenditure on medical care as a whole.
10. Case-finding should be a continuing process and not a "once and for all" project.<sup>1</sup>

## Recommendations

1. While BreastScreen Aotearoa is to be congratulated on the continued improvement in coverage in this quarter, it is recommended that those lead providers who screen fewer than 8.75% of eligible women in each quarter should continue to review their identification and invitation procedures. Where lead providers screen less than the expected number of Maori and/or Pacific women in each quarter, identification and invitation processes for these women should be reviewed. In particular, BreastScreen Central should review the identification and invitation process for Pacific women.
2. The National Screening Unit should consider reviewing health promotion strategies for women in those regions where coverage is lower than expected.
3. Efforts to improve the timeliness of the offer of assessment in BreastScreen Coast to Coast and BreastScreen HealthCare should continue.
4. Elevated technical recall rates persist for BreastScreen Central, BreastScreen Midland, and BreastScreen Coast to Coast in this quarter, and this should be investigated and effective measures to reduce the recall rates instituted.
5. All lead providers should continue to undertake regular film review as part of routine quality assurance. This should include assessment of inter-rater and intra-rater reliability, and the review of films where the final outcome is known (including routine review of the films of all women referred for assessment and women with interval cancers).
6. Provision of offering timely open biopsies should be investigated by lead providers and the National Screening Unit and remedied.
7. The timeliness of the offer of treatment continues to need considerable improvement. Appropriate information and radiology and histology material requested by clinicians to determine treatment options should be made available so that it does not delay the offer of primary treatment. The Ministry of Health and the DHB's should continue to address delays in the provision of treatment such as radiotherapy as the offer of treatment should not be influenced by delays in treatment availability.

**Table 1. Summary of Lead Provider and BreastScreen Aotearoa results against indicators from 1 January 2001 to 30 September 2001.**

Indicator	LEAD PROVIDERS						
	BSAN	BSM	BSCtoC	BSC	BSS	BSHC	BSA
<b>Coverage (%) for 1 January to 30 September 2001</b>							
<i>- Indicator &gt; 70% (&gt;8.75% per quarter or 26.25% for the period 1.1.01 to 30.9.01)</i>							
<b>Overall</b>	18.7	23.0	24.0	23.5	30.0	28.4	23.3
<b>Maori</b>	13.2	13.3	14.7	13.0	20.1	16.1	14.2
<b>Pacific</b>	12.4	26.7	16.3	6.7	26.8	14.2	13.0
<b>Other</b>	19.5	24.6	25.3	25.1	30.2	28.2	24.4
<b>(not stated)</b>	142	14	38	32	120	174	520
<b>Technical recall (%)</b>							
<i>- Indicator (Fixed &lt; 0.5%; Mobile &lt;3%)</i>							
<b>Fixed</b>	0.4	0.1	0.1	1.4	0.4	0.5	0.4
<b>Mobile</b>	2.6	4.1	5.1	4.6	0.4	1.4	3.1
<b>Technical repeat (definition 2) (%)</b>							
<i>Indicator &lt;3%</i>							
<b>Fixed</b>	0.8	1.2	1.1	1.9	1.3	1.5	1.2
<b>Mobile</b>	0.3	0.5	2.0	1.0	0.2	0.4	0.6
<b>Assessment (%)</b>							
<i>Indicator – prevalence screen – indicator is &lt;10%, expected indicator is &lt;7%</i>							
<i>- incidence screen - indicator is &lt;5%, expected indicator is &lt;4%</i>							
Prevalence	8.5	6.2	6.7	9.6	9.4	11.7	8.5
Incidence	4.4	2.8	3.2	3.8	4.9	2.6	3.8
<b>False positive rate (%)</b>							
<i>Indicator – prevalence round, indicator is &lt;9%, expected indicator &lt;6%</i>							
<i>- incidence round, indicator is &lt;4%, expected indicator &lt;3%</i>							
Prevalence	7.2	5.2	5.7	8.6	8.7	10.8	7.4
Incidence	3.7	2.2	2.7	2.9	4.3	2.3	3.2
<b>Open surgical biopsy rate (%)</b>							
<i>Indicator &lt;1%</i>							
	0.3	0.2	0.2	0.3	0.2	0.2	0.2
<b>Benign biopsy weight (%)</b>							
<i>Indicator 80% or more of benign open biopsies should weigh &lt;20g</i>							
	*	*	*	*	*	*	*

\* No longer reported.

....continued

**Table 1 (continued).**

**Summary of Lead Provider and BreastScreen Aotearoa results against indicators from 1 January 2001 to 30 September, 2001.**

Indicator	LEAD PROVIDERS						BSA
	BSAN	BSM	BSCtoC	BSC	BSS	BSHC	
<b>Needle biopsy rate (%)</b>							
<i>Indicator – none; *Women who have both FNA and core needle procedures.</i>							
<b>FNA only</b>	0.1	0.2	0.1	0.1	0.8	0.3	0.3
<b>Core needle only</b>	1.2	1.0	1.2	1.5	1.7	0.6	1.3
<b>Both*</b>	0.1	0.0	0.0	0.2	0.1	0.0	0.1
<b>Other</b>	0.2	0.0	0.0	0.0	0.0	0.0	0.1
<b>Total</b>	1.6	1.2	1.3	1.8	2.6	0.9	1.7
<b>Specificity (%)</b>							
<i>Indicator &gt;93%</i>							
Prevalence	92.7	94.8	94.2	91.3	91.2	89.1	92.5
Incidence	96.3	97.7	97.3	97.1	95.7	97.7	96.8
<b>Detection rate of DCIS and invasive cancer (per thousand women screened)</b>							
<i>Indicator – prevalence - ≥ 6 per 1000 women screened</i>							
<i>- incidence - ≥ 3 per 1000 women screened</i>							
Prevalence	11.3	7.0	7.0	8.1	6.1	6.2	8.2
Incidence	5.3	4.7	3.8	8.3	5.8	2.9	5.1
<b>Time taken providing results of screening (%)</b>							
<i>Indicator – at least 95% notified within 10 days</i>							
	98.0	98.2	98.6	99.2	99.4	92.9	98.1
<b>Time taken from screening visit to first offer of an assessment appointment (%)</b>							
<i>Indicator – at least 90% offered an assessment appointment within 14 working days of their final screening visit</i>							
	88.4	87.1	81.2	93.5	95.1	66.4	88.3
<b>Time taken from assessment to final diagnostic biopsy (%)</b>							
<i>Indicator 1 – at least 90% of women requiring <b>needle biopsy</b> procedure have that procedure completed within 7 days of their assessment</i>							
	84.5	86.0	94.4	94.4	85.3	93.2	87.6
<i>Indicator 2 – at least 90% of women requiring <b>open biopsy</b> procedure offered that procedure within 3 weeks of their assessment</i>							
	45.6	35.3	46.7	65.2	64.3	69.2	52.9
<b>Time taken from final diagnostic biopsy to reporting assessment result (%)</b>							
<i>Indicator – results reported to at least 90% of women within 7 days of final diagnostic biopsy</i>							
	82.6	83.6	88.7	85.7	94.6	87.3	87.6
<b>Time taken from reporting assessment results to first date offered for primary treatment (%)</b>							
<i>Indicator – at least 90% of women offered primary treatment within 3 weeks of the final diagnosis being reported to the women</i>							
	57.2	**	71.4	**	67.1	81.0	64.7

\*\* less than 90% staging data available

## 1. Data Summary

***The key to the tables which appear in this document is:***

*BSAN = BreastScreen Auckland and North*

*BSM = BreastScreen Midland*

*BSCtoC = BreastScreen Coast to Coast*

*BSC = BreastScreen Central*

*BSS = BreastScreen South*

*BSHC = BreastScreen HealthCare*

### 1.1 Registration rate – overall and 1.2 Registration rate – ethnicity

The data provided in the national monitoring data set does not provide useful information about the number of women registered with BreastScreen Aotearoa or the invitation process. BSAIMG has calculated registration figures by subtracting the cumulative number of women registered in the latest enrolment detail table of the national monitoring data set from previous quarterly figures. Unfortunately, some lead providers can only register women within their information system when they attend for screening (Monitoring Report no 7). As lead providers may be entering registration data at different times in the process and there is no data field to record the actual date of registration BSAIMG has ceased reporting registration rates (Recommendation 1, Monitoring Report no 8).

### 1.3 Coverage - overall

**Definition** – this is a population-based measure of the proportion of women 50-64 years of age who have had a screening mammogram in the programme.

**Indicator** - > 70% of women aged 50-64 are to be screened by the programme within each two year screening cycle.

Overall coverage of eligible women is shown in Table 1.3.

Table 1.3. Overall number of women screened and per cent coverage by lead provider.

Lead provider	Quarterly number screened (%)	Cumulative number screened Round 2 (%)	24 month total screened 1.10.99 – 30.9.01
BSAN	7,926 (7.6)	19,587 (18.8)	47,078 (48.8)
BSM	4,145 (8.6)	11,133 (23.2)	27,836 (61.4)
BSCtoC	4,101 (10.1)	9,743 (23.9)	21,510 (56.0)
BSC	3,177 (9.7)	7,763 (23.8)	16,629 (53.1)
BSS	5,836 (10.8)	16,241 (30.0)	38,692 (76.6)
BSHC	2,208 (9.9)	6,339 (28.5)	15,191 (71.1)
TOTAL	27,393 (9.1)	70,806 (23.5)	166,936 (58.9)

It is encouraging that 9.1% of eligible women were screened overall in BreastScreen Aotearoa in this quarter, so that the performance indicator was met. However, lead provider coverage in this quarter ranged from 7.6% to 10.8%. It is recommended that lead providers who screen fewer than 8.75% of eligible women in each quarter continue to review their identification and invitation procedures (Recommendation 1). Similarly, the National Screening Unit of the Ministry of Health should consider reviewing health promotion strategies for women in those regions where coverage is lower than expected (Recommendation 2).

An estimate of coverage for a 24-month period (1.10.99 to 30.9.01) has been added to Table 1.3. The estimated coverage for all lead providers increased from the 24-month period reported in Monitoring Report no 7.

#### 1.4 Coverage - by age group

The number of women screened and coverage for the 50-54, 55-59 and 60-64 year age groups are shown for the quarter (Table 1.4a) and cumulative numbers (Table 1.4b) are shown below.

Table 1.4.a. Age specific number of women screened and quarterly coverage by lead provider.

Lead provider	Quarterly number screened (% of projected population)			
	50-54	55-59	60-64	Total
BSAN	3,021 (7.1)	2,678 (7.8)	2,227 (8.3)	7,926 (7.6)
BSM	1,342 (7.2)	1,349 (8.6)	1,454 (10.6)	4,145 (8.6)
BSCtoC	1,502 (9.3)	1,359 (10.3)	1,240 (10.8)	4,101 (10.1)
BSC	1,188 (8.8)	1,116 (10.5)	873 (10.2)	3,177 (9.7)
BSS	2,411 (11.0)	1,861 (10.7)	1,564 (10.6)	5,836 (10.8)
BSHC	930 (10.4)	727 (10.4)	551 (8.9)	2,208 (9.9)
TOTAL	10,394 (8.5)	9,090 (9.3)	7,909 (9.7)	27,393 (9.1)

Table 1.4.b. Age specific number of women screened and cumulative round 2 coverage (from 1/1/01) by lead provider.

Lead provider	Cumulative number screened – Round 2. (% of projected population)			
	50-54	55-59	60-64	Total
BSAN	7,819 (18.3)	6,403 (18.7)	5,365 (20.0)	19,587 (18.8)
BSM	4,092 (22.0)	3,272 (20.9)	3,769 (27.5)	11,133 (23.2)
BSCtoC	3,673 (22.7)	3,169 (24.1)	2,901 (25.3)	9,743 (23.9)
BSC	2,962 (22.1)	2,661 (24.9)	2,140 (25.0)	7,763 (23.8)
BSS	6,828 (31.2)	5,018 (28.8)	4,395 (29.8)	16,241 (30.0)
BSHC	2,465 (27.4)	2,057 (29.3)	1,817 (29.2)	6,339 (28.5)
TOTAL	27,839 (22.8)	22,580 (23.0)	20,387 (25.0)	70,806 (23.5)

Coverage by age continues to be consistent across each of the three age groups.

## 1.5 Coverage - ethnicity

The number of women screened and coverage by ethnic group for the quarter (Table 1.5a) and cumulative numbers (Table 1.5b) are shown below.

Table 1.5a. Quarterly number of women screened and per cent coverage by ethnic group.

Lead provider	Quarterly number screened (% of projected population)				
	Maori	Pacific	Other	Not stated	Total
BSAN	543 (6.1)	353 (5.3)	6,965 (7.8)	65	7,926 (7.5)
BSM	418 (5.9)	95 (19.7)	3,629 (8.9)	3	4,145 (8.6)
BSCtoC	356 (6.8)	30 (8.9)	3,705 (10.6)	10	4,101 (10.1)
BSC	132 (5.7)	44 (2.9)	2,976 (10.2)	25	3,177 (9.6)
BSS	153 (7.3)	34 (9.3)	5,619 (10.9)	30	5,836 (10.8)
BSHC	54 (5.7)	5 (4.4)	2,099 (9.9)	50	2,208 (9.9)
TOTAL	1,656 (6.2)	561 (5.9)	24,993 (9.3)	183	27,393 (9.0)

Table 1.5b. Cumulative number of women screened and per cent coverage by ethnic group.

Lead provider	Cumulative number screened – Round 2 (% of projected population)				
	Maori	Pacific	Other	Not stated	Total
BSAN	1,169 (13.2)	828 (12.4)	17,448 (19.5)	142	19,587 (18.7)
BSM	941 (13.3)	129 (26.7)	10,049 (24.6)	14	11,133 (23.0)
BSCtoC	768 (14.7)	55 (16.3)	8,882 (25.3)	38	9,743 (24.0)
BSC	302 (13.0)	101 (6.7)	7,328 (25.1)	32	7,763 (23.5)
BSS	425 (20.1)	98 (26.8)	15,598 (30.2)	120	16,241 (30.0)
BSHC	153 (16.1)	16 (14.2)	5,996 (28.2)	174	6,339 (28.4)
TOTAL	3,758 (14.2)	1,227 (13.0)	65,301 (24.4)	520	70,806 (23.3)

Coverage among Maori and Pacific women remains lower than anticipated for most lead provider regions, and this requires improvement by lead providers and the National Screening Unit of the Ministry of Health (See Recommendation 2, Monitoring Report No 9). Quarterly and cumulative totals of the number of Pacific women screened by BreastScreen Midland (26.7%) and BreastScreen South (26.8%) were higher than for other lead providers. BreastScreen Central should explore the reasons for the lower coverage of Pacific women (see Recommendation 1).

## 2. Provision of high quality screening and assessment

### 2.1 Screened women who have no more than four films taken.

**Indicator** - Minimum of 80% of women screened have four films or less.

From the data available, the number of films per women by lead provider and mobile and fixed screening centres are shown in Table 2.1.

Table 2.1. Proportion of women having four films or less at screening by lead provider.

Lead Provider	Quarter (%)		Cumulative rate (%)	
	Fixed	Mobile	Fixed	Mobile
BSAN	83.6	97.2	84.2	95.5
BSM	87.8	85.7	88.4	86.9
BSCtoC	90.9	90.4	89.2	90.8
BSC	77.0	94.7	78.4	94.3
BSS	82.8	81.6	84.5	84.7
BSHC	79.6	77.6	74.9	76.4
TOTAL	84.1	87.9	84.3	87.8

The proportion of women having four films at screening continues to be influenced by lead providers' choice of large or small films for screening. BreastScreen Central has had a lower proportion than usual for their fixed site in the last two quarters.

## 2.2 Technical recall rate

**Definition** - Number of women recalled for technical repeats as a percentage of number screened.

**Indicator** - Mobile < 3%  
- Fixed < 0.5%

The definition given above has been taken from the Data Management Manual and is different from that listed in the Interim National Quality Standards. The number of women recalled for technical reasons as a percentage of the number of women screened is shown in Table 2.2.

Table 2.2. Technical recall rates per 100 women screened (per cent) by lead provider.

Lead Provider	Quarter (%)		Cumulative rate (%)	
	Fixed	Mobile	Fixed	Mobile
BSAN	0.4	2.0	0.4	2.6
BSM	0.1	3.9	0.1	4.1
BSCtoC	0.2	4.6	0.1	5.1
BSC	0.9	4.7	1.4	4.6
BSS	0.2	0.4	0.4	0.4
BSHC	0.5	1.6	0.5	1.4
TOTAL	0.3	3.0	0.4	3.1

It is important to minimise recall rates because high recall rates cause inconvenience and anxiety for women, and may thus make the programme less acceptable. High recall rates also cause women to be exposed to extra radiation (although the risk associated with this is very small), and high recall rates increase costs for BreastScreen Aotearoa.

The elevated technical recall rate at the fixed mammography site of BreastScreen Central, and the mobile sites for BreastScreen Midland, BreastScreen Coast to Coast and BreastScreen Central should be investigated and effective measures to reduce the recall rate instituted (Recommendation 4).

## 2.3 Technical repeat rate

### 2.3.1 Technical repeat rate – Definition 1

**Definition 1 (from the Data Management Manual)** – Number of women with technical repeats (including technical recalls) as a percentage of number screened.

**Indicator** - <3%

BSAIMG consider that the definition of technical repeats in the Data Management Manual is not useful. This will be addressed in the Ministry of Health review of the Interim National Quality Standards. The definition preferred by BSAIMG, is Definition 2, the number of technical repeat films as a percentage of the total number of films taken.

### 2.3.2 Technical repeat rate – Definition 2

**Definition 2** - Number of technical repeat films as a percentage of the total number of films taken.

**Indicator** - < 3%.

The technical repeat rate as defined by the monitoring group (definition 2) is shown in Table 2.3.2.

Table 2.3.2. Technical repeat rate per 100 films taken by lead provider.

Lead Provider	Quarterly technical repeat rate		Cumulative technical repeat rate	
	Fixed	Mobile	Fixed	Mobile
BSAN	1.0	0.8	0.8	0.3
BSM	1.0	0.4	1.2	0.5
BSCtoC	0.8	2.3	1.1	2.0
BSC	1.6	0.3	1.9	1.0
BSS	1.2	0.2	1.3	0.2
BSHC	1.3	0.6	1.5	0.4
TOTAL	1.1	0.7	1.2	0.6

All lead providers met this performance indicator for both quarterly and cumulative results.

## 2.4 Assessment rate

**Definition** - Number referred to assessment as a percentage of number screened.

**Indicator** – prevalence screen: indicator is < 10% and the expected indicator is < 7%  
 – incidence screen: indicator is < 5% and the expected indicator is < 4%

The rates of referral to assessment are shown in Table 2.4 below.

Table 2.4. The rate of referral to assessment per 100 women screened by lead provider.

Lead provider	Quarterly assessment rate (n)		Cumulative assessment rate (n)	
	Prevalence	Incidence	Prevalence	Incidence
BSAN	9.0 (238)	4.8 (256)	8.5 (717)	4.4 (496)
BSM	7.9 (92)	2.8 (85)	6.2 (258)	2.8 (199)
BSCtoC	6.9 (70)	2.7 (84)	6.7 (231)	3.2 (200)
BSC	10.6 (98)	3.4 (76)	9.6 (274)	3.8 (187)
BSS	10.7 (199)	5.0 (198)	9.4 (645)	4.9 (457)
BSHC	8.4 (43)	1.9 (33)	11.7 (170)	2.6 (128)
TOTAL	9.1 (740)	3.8 (732)	8.5 (2,295)	3.8 (1,667)

The referral rates with 95% confidence intervals for BSA for this quarter were:

Prevalence 9.1% (8.5% - 9.8%)

Incidence 3.8% (3.5% - 4.1%)

All lead providers achieved results within the indicator range for incidence screening. The prevalent referral to assessment rate increased for all lead providers during the quarter except BreastScreen HealthCare, which continued to reduce its rate.

## **2.5 Outstanding assessment records of the national monitoring data set**

The National Screening Unit (NSU) advised BSAIMG that there were 56 assessment records outstanding in this quarter. Of these 56 women, 13 have since completed assessment and the records have been sent to NZHIS for inclusion in the national monitoring data set. Of the remaining records, 19 records remain incomplete, one record is undergoing NHI maintenance, ten women are on extended assessment, nine have exited the programme, and four have chosen to go to private providers.

## 2.6 False positive rate

**Definition** - Number with false positive screening results as a percentage of number screened.

**Indicator** -prevalence round: indicator is < 9% and the expected indicator is < 6%  
 -incidence round: indicator is < 4% and the expected indicator is < 3%

False positive rates are shown in Table 2.6.

Table 2.6. False positive rate per 100 women screened by lead provider.

Lead provider	Quarterly false positive rate (n)		Cumulative false positive rate (n)	
	Prevalence	Incidence	Prevalence	Incidence
BSAN	7.5 (198)	4.0 (211)	7.2 (602)	3.7 (415)
BSM	6.6 (77)	2.0 (61)	5.2 (214)	2.2 (157)
BSCtoC	5.8 (59)	2.4 (74)	5.7 (196)	2.7 (170)
BSC	9.5 (88)	2.8 (63)	8.6 (245)	2.9 (143)
BSS	10.0 (186)	4.3 (172)	8.7 (597)	4.3 (401)
BSHC	8.2 (42)	1.6 (27)	10.8 (158)	2.3 (110)
TOTAL	8.0 (650)	3.2 (608)	7.4 (2,012)	3.2 (1,396)

The false positive rates with 95% confidence intervals for BSA for this quarter were:

Prevalence 8.0% (7.4% - 8.6%)

Incidence 3.2% (2.9% - 3.4%)

All lead providers except BreastScreen South and BreastScreen Central met the performance indicator for the false positive rate for prevalence screening in this quarter. All lead providers, except BreastScreen South met the incidence screening performance indicator for the false positive rate. BreastScreen HealthCare continues to reduce its false positive rate. These are considered very encouraging results.

## 2.7 Open surgical biopsy rate

**Definition** - Number of women having open biopsy as a percentage of women screened.

**Indicator** - < 1%

The open surgical biopsy rate is shown in Table 2.7.

Table 2.7. Number and rate of open surgical biopsy per 100 women screened by lead provider.

Lead Provider	Quarterly open surgical biopsy rate per 100 women screened (number of women)	Cumulative open surgical biopsy rate per 100 women screened (number of women)
BSAN	0.3 (24)	0.3 (57)
BSM	0.1 (6)	0.2 (17)
BSCtoC	0.05 (2)	0.2 (15)
BSC	0.3 (10)	0.3 (23)
BSS	0.2 (9)	0.2 (28)
BSHC	0.1 (2)	0.2 (13)
TOTAL	0.2 (53)	0.2 (153)

All lead providers met the indicator for the number of open surgical biopsies per 100 women screened.

## 2.8 Benign biopsy weight

**Definition** - Number with benign open biopsy where weight of benign lesion is less than 20 grams as a percentage of the number with benign open biopsy.

**Indicator** - 80% or more of open biopsies (benign result) should weigh < 20gm.

The number of women having benign open biopsy where the lesion weighed less than 20 gm is recorded in Table 2.8.

Table 2.8. Number and percent of benign open biopsies, which weigh <20gm by lead provider.

Lead Provider	Quarterly percent of benign biopsies weighing less than 20gm (n)	Cumulative percent of benign biopsies weighing less than 20gm (n)
BSAN	47.4 (9)	48.9 (22)
BSM	80.0 (4)	60.0 (6)
BSCtoC	100 (1)	*
BSC	71.4 (5)	64.3 (9)
BSS	37.5 (3)	45.8 (11)
BSHC	100 (2)	90.0 (9)
TOTAL	57.1 (24)	55.3 (57)

\* 80% of the benign open biopsies from BreastScreen Coast to Coast had a default weight recorded within the national monitoring data set therefore the record has not been reported.

It was recommended in Monitoring Report No. 9 that this indicator no longer be reported but we will await the outcome of the Interim National Quality Standards Review process before removing it from monitoring reports.

## 2.9 Needle biopsy rates

### Definition

- Number of women undergoing fine needle aspiration (FNA) as a percentage of the number screened.
- Number of women undergoing core biopsy as a percentage of number screened.

**Indicator** - None set

The number of women having needle biopsies for the quarter and the cumulative total for Round 2 is shown in Tables 2.9a and Table 2.9b.

Table 2.9a. Quarterly rate of needle biopsy per 100 women screened and numbers of women undergoing needle biopsy (n) by lead provider.

Lead Provider	Quarterly Totals				
	FNA only % (n)	Core needle only % (n)	Both* % (n)	Other % (n)	Total
BSAN	0.1 (9)	1.1 (87)	0.1 (10)	0.2 (12)	1.5 (118)
BSM	0.2 (8)	1.1 (44)	0.0 (1)	0.0 (2)	1.3 (55)
BSCtoC	0.1 (5)	1.1 (46)	0.0 (0)	0.0 (0)	1.2 (51)
BSC	0.1 (2)	1.4 (46)	0.0 (0)	0.0 (0)	1.5 (48)
BSS	0.7 (42)	1.6 (94)	0.1 (2)	0.0 (0)	2.3 (136)
BSHC	0.4 (8)	0.5 (10)	0.0 (0)	0.0 (0)	0.9 (20)
Total	0.3 (74)	1.2 (327)	0.0 (13)	0.1 (14)	1.6 (428)

Table 2.9b. Cumulative rate of needle biopsy per 100 women screened and numbers of women undergoing needle biopsy (n) by lead provider for Round 2.

Lead Provider	Cumulative Totals				
	FNA only % (n)	Core needle only % (n)	Both* % (n)	Other % (n)	Total % (n)
BSAN	0.1 (17)	1.2 (237)	0.1 (22)	0.2 (34)	1.6 (310)
BSM	0.2 (17)	1.0 (115)	0.0 (1)	0.0 (3)	1.2 (136)
BSCtoC	0.1 (9)	1.2 (116)	0.0 (0)	0.0 (0)	1.3 (125)
BSC	0.1 (10)	1.5 (115)	0.2 (18)	0.0 (0)	1.8 (143)
BSS	0.8 (130)	1.7 (278)	0.1 (21)	0.0 (0)	2.6 (429)
BSHC	0.3 (21)	0.6 (38)	0.0 (0)	0.0 (0)	0.9 (59)
TOTAL	0.3 (204)	1.3 (899)	0.1 (62)	0.1 (37)	1.7 (1,202)

\* Women who have both FNA and core needle procedures

BreastScreen Central has responded well to the BSAIMG recommendation that the combined use of FNA and core needle biopsy be reduced.

The number of women who had needle and open biopsy procedures as a percentage of the number of women referred to assessment for the quarter and cumulatively is shown in Table 2.9c.

Table 2.9c Number of women having biopsy procedures as a percentage of the women referred to assessment.

Lead provider	Number of women with biopsy procedures as a percentage of the number referred to assessment (number of women)	
	Quarterly total	Cumulative total
BSAN	26.7 (132)	27.6 (335)
BSM	31.1 (55)	30.0 (137)
BSCtoC	33.8 (52)	31.1 (134)
BSC	28.2 (49)	32.1 (148)
BSS	34.5 (137)	39.0 (430)
BSHC	26.3 (20)	21.1 (63)
Total	30.2 (445)	31.5 (1,247)

BreastScreen South had a higher quarterly and cumulative proportion of women who attend assessment and then proceed to either needle or open biopsy procedures.

## 2.10 Specificity of the Programme

**Definition** - Number with true negative screening results as a percentage of this number plus the number with false positive screening results.

**Indicator** - > 93%

Specificity results are recorded in Table 2.10.

Table 2.10. Specificity of the programme by lead provider.

Lead provider	Quarterly specificity (%)		Cumulative specificity (%)	
	Prevalence	Incidence	Prevalence	Incidence
BSAN	92.4	96.0	92.7	96.3
BSM	93.3	97.9	94.8	97.7
BSCtoC	94.2	97.6	94.2	97.3
BSC	90.4	97.2	91.3	97.1
BSS	89.9	95.6	91.2	95.7
BSHC	91.8	98.4	89.1	97.7
TOTAL	91.9	96.8	92.5	96.8

In Monitoring Report No 9 it was recommended that the performance indicator for specificity in incidence screening be set at >96%. This is consistent with the incidence screening performance indicator for the false positive rate. In this quarter all lead providers achieved specificity of >96% for incident screening.

Specificity for prevalence screening tends to be lower (partly because the radiologists do not have access to earlier mammograms for comparison), and this is seen in the results for this quarter. Some lead providers did not meet the prevalence screening indicator in this quarter or in the last two quarters (cumulative totals). Lead providers should monitor prevalence screening specificity and continue to use routine film review as part of their quality assurance procedures (see Recommendation 5).

### 3. Early detection of DCIS or breast cancer

#### 3.1 Detection rate of DCIS or breast cancer

Definition – number with diagnosed DCIS or breast cancer per 1000 women screened.

Indicator - prevalence round: indicator is  $\geq 6$  per 1000 women screened  
 - incidence round: indicator is  $\geq 3$  per 1000 women screened

The number of women recorded with a final diagnosis of DCIS or invasive breast cancer is recorded in Table 3.1.

Table 3.1. Detection rate of DCIS and invasive breast cancer by lead provider per 1000 women screened.

Lead provider	Quarterly cancer detection rate (n)		Cumulative cancer detection rate Round 2 (n)	
	Prevalence	Incidence	Prevalence	Incidence
BSAN	10.6 (28)	4.9 (26)	11.3 (95)	5.3 (59)
BSM	6.9 (8)	4.7 (14)	7.0 (29)	4.7 (33)
BSCtoC	6.9 (7)	2.3 (7)	7.0 (24)	3.8 (24)
BSC	9.7 (9)	4.4 (10)	8.1 (23)	8.3 (41)
BSS	5.4 (10)	6.0 (24)	6.1 (42)	5.8 (54)
BSHC	1.9 (1)	2.4 (4)	6.2 (9)	2.9 (14)
TOTAL	7.8 (63)	4.4 (85)	8.2 (222)	5.1 (225)

The detection rates with 95% confidence intervals for BSA for this quarter were:

Prevalence 7.8 per 1,000 women screened (5.9 - 9.7)

Incidence 4.4 per 1,000 women screened (3.5 – 5.3)

The breast cancer detection rate for BreastScreen HealthCare was below the expected indicator for incidence screening, both for the last quarter, and for the round 2 cumulative total. However, the number of cancers for the relatively short time period indicates this may have occurred by chance. All other lead providers met the cumulative performance indicators for prevalence and incidence screening.

The quarterly and cumulative referral to assessment, specificity, false positive rate and detection rate of DCIS and invasive breast cancer by prevalence and incidence screen are summarised in Table 3.1.1a, Table 3.1.1b, Table 3.1.1c and Table 3.1.1d.

Table 3.1.1a. Referral to assessment, specificity, false positive rate and detection rate for prevalence screening of DCIS and invasive cancer rate by lead provider for the quarter 1.7.01 – 30.9.01.

Lead provider	Referral to assessment per 100 women screened	Specificity (%)	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	9.0	92.4	7.5	10.6
BSM	7.9	93.3	6.6	6.9
BSCtoC	6.9	94.2	5.8	6.9
BSC	10.6	90.4	9.5	9.7
BSS	10.7	89.9	10.0	5.4
BSHC	8.4	91.8	8.2	1.9
TOTAL	9.1	91.9	8.0	7.8

Table 3.1.1b. Referral to assessment, specificity, false positive rate and detection rate for incidence screening of DCIS and invasive breast cancer by lead provider for the quarter 1.7.01 – 30.9.01.

Lead provider	Referral to assessment per 100 women screened	Specificity (%)	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	4.8	96.0	4.0	4.9
BSM	2.8	97.9	2.0	4.7
BSCtoC	2.7	97.6	2.4	2.3
BSC	3.4	97.2	2.8	4.4
BSS	5.0	95.6	4.3	6.0
BSHC	1.9	98.4	1.6	2.4
TOTAL	3.8	96.8	3.2	4.4

Table 3.1.1c. Referral to assessment, specificity, false positive rate and detection rate for prevalence screening of DCIS and invasive cancer rate by lead provider for the period 1.1.01 – 30.9.01.

Lead provider	Referral to assessment per 100 women screened	Specificity (%)	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	8.5	92.7	7.2	11.3
BSM	6.2	94.8	5.2	7.0
BSCtoC	6.7	94.2	5.7	7.0
BSC	9.6	91.3	8.6	8.1
BSS	9.4	91.2	8.7	6.1
BSHC	11.7	89.1	10.8	6.2
TOTAL	8.5	92.5	7.4	8.2

Table 3.1.1d. Referral to assessment, specificity, false positive rate and detection rate for incidence screening of DCIS and invasive breast cancer by lead provider for the period 1.1.01 – 30.9.01.

Lead provider	Referral to assessment per 100 women screened	Specificity (%)	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	4.4	96.3	3.7	5.3
BSM	2.8	97.7	2.2	4.7
BSCtoC	3.2	97.3	2.7	3.8
BSC	3.8	97.1	2.9	8.3
BSS	4.9	95.7	4.3	5.8
BSHC	2.6	97.7	2.3	2.9
TOTAL	3.8	96.8	3.2	5.1

All lead providers should continue to undertake regular film review as part of routine quality assurance. This should include assessment of inter-rater and intra-rater reliability, and the review of films where the final outcome is known (including routine review of the films of all women referred for assessment and women with interval cancers) (Recommendation 5).

The breast cancer detection rates for BreastScreen HealthCare were below the expected indicator for incidence screening. BreastScreen HealthCare has reduced its referral to assessment rate over the last six months. This has had a positive impact on specificity and the false positive rate, but it would be of concern if it has adversely affected the breast cancer detection rate. Because the rates are based on relatively small numbers of cancers, the cumulative results are more useful than quarterly results for this indicator but may still be due to chance. Cumulative breast cancer detection rates for BreastScreen HealthCare needs to be closely monitored in subsequent quarterly reports. BreastScreen HealthCare should continue to use routine film review, including assessment of inter-rater and intra-rater reliability, as part of routine quality assurance.

### 3.2 DCIS and invasive cancer

There is an inevitable delay in the recording of details about DCIS or invasive breast cancer diagnosed as a result of screening, due to the time required to arrange treatment and the subsequent recording of treatment data by lead providers. To make allowance for this delay cancer details recorded within this quarterly monitoring report have been provided for women screened up to the end of December 2000 (6 months prior to the start of this quarter).

The National Screening Unit has experienced considerable difficulty in obtaining the data specified in the Data Management Manual for the national monitoring data set. Four lead providers achieved 90% completion of cancer detail records from the commencement of screening to the end of December 2000. In view of the fundamental necessity of this data for the assessment of the effectiveness of BreastScreen Aotearoa the monitoring group will report the results for those lead providers with 90% or more of their treatment records completed. However, the effectiveness of the programme cannot be determined from the incomplete records available.

Table 3.2 shows the available data for each lead provider.

Table 3.2 Completion status of pTMN staging for women with DCIS and invasive breast cancer detected for the period 1.12.1998 - 31.12.2000.

Lead provider	Number of cancers with pTMN staging completed (total number of cancers)	Percentage
BSAN	341 (362)	94.2
BSM	125 (152)	82.2
BSC to C	133 (140)	95.0
BSC	62 (108)	57.4
BSS	232 (250)	92.8
BSHC	81 (90)	90.0
Total	974 (1,102)	88.4

Of the 1,102 women recorded with a diagnosis of DCIS or cancer from the commencement of BreastScreen Aotearoa to the 31 December 2000, 974, or 88.4%, have the UICC TNM Classification of the cancer stage, nodal status and the presence of distant metastatic disease recorded in the national monitoring data set.

One of the most important ways to monitor the programme, and estimate its likely impact on breast cancer mortality, is to examine the stage distribution, size, and grade of tumours detected, and the absolute rate of advanced cancers detected. Only then can results from BreastScreen Aotearoa be compared with the results of randomised controlled trials of breast screening and overseas programmes. As the data are incomplete it is impossible to do this, since the information available is probably not representative of all the cancers detected. Interpretation of the information on stage

distribution, histological grade, or size of tumours detected will be difficult until complete information for a chronological period is available.

Details of the cancers recorded in the national monitoring data set are summarised below. The UICC/pTNM system shown below and used by lead providers classifies the DCIS and breast cancers detected:

- TX Primary tumour cannot be assessed
- T0 No evidence of primary tumour
- Tis Carcinoma in situ: intraductal carcinoma, lobular carcinoma in situ or Pagets disease of the nipple with no tumour
- T1 Tumour 2cm or less in greatest dimension
  - pT1a 0.5 cm or smaller
  - pT1b more than 0.5cm but not more than 1cm in greatest dimension
  - pT1c more than 1cm but not more than 2cm in greatest dimension
- T2 Tumour more than 2cm but not more than 5cm in greatest dimension
- T3 Tumour more than 5cm in greatest dimension
- T4 Tumour of any size with direct extension to chest wall or skin

Subcategories for the staging of pT4 tumours exist within the UICC/pTNM system. These are listed below but it is not necessary to record these subcategories in the national monitoring data set.

- T4a Extension to chest wall
- T4b Edema (including peau d'orange), ulceration of the skin of the breast, or satellite skin nodules confined to the same breast
- T4c Both (T4a and T4b)
- T4c Inflammatory carcinoma.

For the purposes of BSAIMG monitoring reports the number of invasive breast cancers has been calculated by combining pT0, pTX, pT1a, pT1b, pT1c, pT2, pT3 and pT4. PTis (non invasive DCIS) is not invasive breast cancer.

The pathological stage of disease of DCIS and cancers detected for which information was available is shown in Table 3.2.1.

Table 3.2.1 Reported primary tumour classification by pathological stage and lead provider for the period 1.12.98 – 31.12.00.

Pathological stage	BSAN	BSM	BSC to C	BSC	BSS	BSHC	Total (%)
<i>DCIS (per cent of all tumours)</i>							
pTis (DCIS)	96 (28.2)	*	20 (15.0)	*	49 (21.1)	12 (14.8)	177 (22.5)
<i>Invasive cancers (per cent of invasive cancers)</i>							
pTX**	1 (0.4)		1 (0.9)		0 (0)	0 (0)	2 (0.3)
pT0	0 (0)		3 (2.6)		1 (0.5)	0 (0)	4 (0.7)
pT1a	31 (12.7)		36 (31.8)		23 (12.6)	10 (14.5)	100 (16.4)
pT1b	72 (29.4)		9 (8.0)		48 (26.2)	25 (36.2)	154 (25.2)
pT1c	88 (35.9)		27 (23.9)		83 (45.4)	24 (34.8)	222 (36.4)
pT2	41 (16.7)		35 (31.0)		27 (14.8)	8 (11.6)	111 (18.2)
pT3	6 (2.5)		2 (1.8)		0 (0)	2 (2.9)	10 (1.6)
pT4	6 (2.5)		0 (0)		1 (0.5)	0 (0)	7 (1.2)
Total	245 (100)	*	113 (100)	*	183 (100)	69 (100)	610 (100)

\* less than 90% of staging data available.

\*\* Primary tumour can not be assessed.

Of the total 787 women with breast cancer and DCIS detected, 177 had a diagnosis of DCIS. Of the 610 women with invasive breast cancer recorded in the national monitoring data set 609 (99.8%) had the size of the invasive component recorded. It is necessary to obtain and record this information for all invasive tumours detected in the programme in order to assess the likely effectiveness of BreastScreen Aotearoa in reducing breast cancer mortality.

For women screened with DCIS or invasive breast cancer 22.5% had DCIS only and 77.5% had invasive breast cancer detected. Of the women known to have invasive breast cancer detected, 254 (41.6%) had tumours less than or equal to 10mm in size and 501 (82.1%) had tumours less than or equal to 20mm in size.

### 3.3 Invasive cancer

The number of women with invasive cancer recorded in the national monitoring data set as a proportion of the total number screened is recorded in Table 3.3.

**Definition** – number of women screened who are diagnosed with invasive breast cancer per 1000 women screened.

**Indicator**  $\geq 4.8$  per 1000 women screened

The invasive cancer detection rate per 1000 women screened is shown in Table 3.3.

Table 3.3.1 Invasive cancer detection rate by lead provider per 1000 women screened for the period 1.12.98 – 31.12.00.

Lead Provider	Cumulative invasive cancer detection rate per 1000 women (number with invasive cancer detected)
BSAN	5.7 (245)
BSM	*
BSCtoC	5.5 (113)
BSC	*
BSS	5.4 (183)
BSHC	4.7 (69)
TOTAL	5.4 (610)

\* less than 90% of staging data available.

BreastScreen Auckland and North, BreastScreen Coast to Coast, and BreastScreen South met the indicator for the invasive cancer detection rate for the period ending December 31, 2000. BreastScreen HealthCare, which is conducting mainly incidence screening, almost met the indicator.

Table 3.3.2 shows the nodal involvement of women with breast cancer recorded in the national monitoring data set.

The regional lymph nodes are classified as follows:

pNX	Regional lymph node metastasis cannot be assessed
pN0	No regional lymph node metastasis
pN1	Metastasis to one or more movable ipsilateral axillary nodes
pN1a	Only micro metastasis (none larger than 0.2cm)
pN1b	Metastasis to one or more lymph nodes, any of which is larger than 0.2cm
pN1bii	Metastasis in one to three lymph nodes, any of which is larger than 0.2cm and all less than 2cm in greatest dimension
pN1biii	Extension of tumour beyond the capsule of a lymph node metastasis less than 2cm in greatest dimension
pN1biv	Metastasis to a lymph node 2cm or more in greatest dimension
pN2	Metastasis to ipsilateral axillary lymph nodes that are fixed to one another or to other structures
pN3	Metastasis to one ore more ipilateral internal mammary

Table 3.3.2 Nodal status of women with invasive breast cancer by lead provider for the period 1.12.98 – 31.12.00.

Lead provider	pT	pNX (%)	pN0 (%)	pN1 (%)	pN2 (%)	Total (%)	
BSAN	1a	0	31	0	0	31 (12.7)	
	1b	2	61	9	0	72 (29.4)	
	1c	0	68	20	0	88 (35.9)	
	2	1	21	19	0	41 (16.7)	
	3	0	0	6	0	6 (2.4)	
	4	1	3	2	0	6 (2.4)	
	X**	1	0	0	0	1 (0.4)	
	Total		5 (2.0)	184 (75.1)	56 (22.9)	0 (0)	245 (100)
BSM	*	*	*	*	*	*	
BSCtoC	0	0	3	0	0	3 (2.7)	
	1a	0	30	6	0	36 (31.9)	
	1b	0	8	1	0	9 (8.0)	
	1c	0	20	7	0	27 (23.9)	
	2	0	22	12	1	35 (31.0)	
	3	0	1	1	0	2 (1.8)	
	X**	0	0	1	0	1 (0.9)	
	Total		0 (0)	84 (74.3)	28 (24.8)	1 (0.9)	113 (100)
BSC	*	*	*	*	*	*	
BSS	0	0	0	1	0	1 (0.5)	
	1a	1	21	1	0	23 (12.6)	
	1b	1	40	7	0	48 (26.2)	
	1c	1	64	17	1	83 (45.4)	
	2	0	11	16	0	27 (14.8)	
	4	0	0	0	1	1 (0.5)	
	Total		3 (1.6)	136 (74.3)	42 (23.0)	2 (1.1)	183 (100)
	BSHC	1a	1	7	2	0	10 (14.5)
1b		0	23	2	0	25 (36.2)	
1c		0	18	6	0	24 (34.8)	
2		0	5	3	0	8 (11.6)	
3		0	1	1	0	2 (2.9)	
Total			1 (1.4)	54 (78.3)	14 (20.3)	0 (0)	69 (100)
Total		9 (1.5)	464 (76.1)	134 (22.0)	3 (0.5)	610 (100)	

\* less than 90% of staging data available.

\*\* Primary tumour can not be assessed.

For the four lead providers with treatment data reported, over 74% of the women with invasive breast cancer detected had no nodal involvement.

Distant metastasis (M) is classified as follows:

- MX Presence of distant metastasis cannot be assessed
- M0 No distant metastasis
- M1 Distant metastasis (including metastases to one or more ipsilateral supraclavicular nodes)

Table 3.3.3 shows the presence of distant metastatic disease for women with invasive breast cancer.

Table 3.3.3 Distant metastatic disease for women with invasive breast cancer by lead provider for the period 1.12.98 – 31.12.00.

Lead provider	pMX n (%)	pM0 n (%)	pM1 n (%)	Total n (%)
BSAN	184 (75.1)	55 (22.4)	6 (2.5)	245 (100)
BSM	*	*	*	
BSCtoC	6 (5.3)	107 (94.7)	0 (0)	113 (100)
BSC	*	*	*	
BSS	1 (0.5)	182 (99.5)	0	183 (100)
BSHC	0 (0)	69 (100)	0	69 (100)
Total	191 (31.3)	413 (67.7)	6 (1.0)	610 (100)

\* less than 90% of staging data available.

Of the 610 women with invasive breast cancer detected, six women had metastatic disease.

The histological grade of the breast cancer detected is shown for women for whom TNM stage was available in Table 3.3.4. Histological grade has been classified using the modified Bloom and Richardson grading system.

Table 3.3.4 Grade of invasive breast cancer by lead provider for the period 1.12.98 – 31.12.00.

Lead provider	Grade 1	Grade 2	Grade 3	No grading	Total
BSAN	72 (29.5)	134 (54.9)	33 (13.5)	5 (2.0)	244 (100)
BSM	*	*	*		
BSCtoC	47 (41.6)	38 (33.6)	14 (12.4)	14 (12.4)	113 (100)
BSC	*	*	*		
BSS	82 (44.8)	59 (32.2)	22 (12.0)	20 (10.9)	183 (100)
BSHC	32 (46.4)	23 (33.3)	8 (11.6)	6 (8.7)	69 (100)
Total	233 (38.3)	254 (41.7)	77 (12.6)	45 (7.4)	609 (100)

\* less than 90% of staging data available.

“No grading” is a valid value within the national monitoring data set. The European Guidelines recommend that all histological subtypes of cancers are graded. This requires some commitment and strict adherence to a recommended protocol.<sup>2</sup>

### 3.4 Nodal involvement

**Definition** – number with invasive breast cancer detected which involve axillary nodes as a percentage of the number with diagnosed invasive cancer.

**Indicator** - At least 70% of women with invasive breast cancers detected by the programme should be node negative.

For those women with breast cancer for which nodal status was recorded in the national monitoring data set, the percentage that were node negative is shown in Table 3.4.

Table 3.4. Percentage of women with invasive breast cancer who did not have nodal involvement for the period 1.12.98 – 31.12.00.

Lead Provider	Cumulative percentage with no nodal involvement (number with invasive cancer detected)
BSAN	76.7 (184)
BSM	*
BSCtoC	75.2 (85)
BSC	*
BSS	76.7 (138)
BSHC	79.4 (54)
TOTAL	76.7 (461)

\* less than 90% of staging data available.

Note: the five women with breast cancer who had pT0 cancers have been included in the denominator. pNX (regional lymph nodes can not be assessed) have not been included.

For the women with breast cancer details recorded, all lead providers meet this indicator. This is an encouraging result, and it is consistent with the desirable level set for screening programmes in the European Union of >70% of cancers detected at initial screening being node-negative.

### 3.5 Ductal carcinoma in situ

**Definition** – number with DCIS as a percentage of the number with diagnosed cancer.

**Indicator** 10 – 25% of all cancers detected by the programme.

The number and percentage of women with DCIS detected is shown in Table 3.5.

Table 3.5. Women with ductal carcinoma in situ as a percentage of women detected with cancer by lead provider for the period 1.12.1998 – 31.12.2000.

Lead Provider	Cumulative percentage of ductal carcinoma in situ (number with DCIS detected)
BSAN	28.2 (96)
BSM	*
BSCtoC	15.0 (20)
BSC	*
BSS	21.1 (49)
BSHC	14.8 (12)
TOTAL	22.5 (177)

\* less than 90% of staging data available.

All lead providers met this important performance indicator of 10-25% of cancers detected being DCIS. This is an encouraging result for BreastScreen Aotearoa.

## 4. Summary of treatment

Four lead providers recorded more than 90% of the cancer and treatment detail in the national monitoring data set for women screened to the end of December 2000. This is an improvement on previous monitoring reports. Of the 1102 women with breast cancer and DCIS detected to 31 December 2000, 787 had staging details of their cancer and DCIS recorded. Of these 787 women, 739 had the last surgical treatment procedure recorded within the national monitoring data set.

### 4.1 Surgery

The last surgical treatment procedure on the breast containing the primary tumour is shown in Table 4.1.

Table 4.1 Last surgical treatment procedure on the breast containing the primary tumour by lead provider for the period 1.12.98 – 31.12.00.

Lead provider	Excision biopsy n (%)	Wide local excision n (%)	Sector resection n (%)	Mastectomy n (%)	Other n (%)	Total n (%)
BSAN	3 (0.9)	82 (25.6)	102 (31.9)	129 (40.3)	4 (1.3)	320 (100)
BSM	*	*	*	*	*	*
BSC to C	6 (4.5)	45 (33.8)	0 (0)	81 (60.9)	1 (0.8)	133 (100)
BSC	*	*	*	*	*	*
BSS	24 (10.4)	97 (42.0)	9 (3.9)	100 (43.3)	1 (0.4)	231 (100)
BSHC	0 (0)	34 (61.8)	1 (1.8)	19 (34.6)	1 (1.8)	55 (100)
TOTAL	33 (4.5)	258 (34.9)	112 (15.2)	329 (44.5)	7 (0.9)	739 (100)

\* less than 90% of staging data available.

The treatment options available were influenced by the stage of cancer detected, which varied between lead providers (see Table 3.2.1).

The four women with no evidence of primary tumour (pT0) recorded all had surgical treatment. The pTNM stage of these women may have been inaccurately recorded in the national monitoring data set or the tumour may have been removed during investigative biopsy. However, two of these women had wide local excision and two women had mastectomy suggesting that the stage may not have been accurately recorded in the national monitoring data set. One woman, who had wide local excision, did not have axillary sampling or dissection. The other woman had level one axillary sampling. The two women who had mastectomy also had axillary dissection to level one and two with nine and twenty-four nodes examined respectively. The woman with twenty-four nodes examined had two positive nodes.

## **4.2 Axillary dissection**

Axillary dissection is usually performed as part of surgical treatment for invasive breast cancer in order to stage the disease and assist in subsequent planning of adjuvant therapy and to reduce the risk of loco-regional recurrence. The following details the levels of axillary dissection procedures:

- Level 1 is up to the lateral border of the pectoralis minor;
- Level 2 is up to the medial border of the pectoralis minor;
- Level 3 is up to the apex of the axilla.

Table 4.2 records the details of axillary sampling and dissection for women with invasive breast cancer and DCIS.

Table 4.2 Axillary sampling and dissection by pT staging and lead provider for the period 1.12.98 – 31.12.00

Lead provider	pT	Axillary sampling (%)	Axillary dissection level 1 (%)	Axillary dissection level 1 & 2 (%)	Axillary dissection level 1, 2 & 3 (%)	No axillary dissection (%)	Not recorded ***(%)	Total (%)
BSAN	1a	1	1	27	0	0	2	31
	1b	9	2	58	0	2	1	72
	1c	4	6	73	4	0	1	88
	2	0	2	35	2	1	1	41
	3	0	1	5	0	0	0	6
	4	0	0	3	1	1	1	6
	X**	0	0	0	0	0	1	1
	in-situ	6	2	6	0	68	14	96
Total	20 (5.9)	14 (4.1)	207 (60.7)	7 (2.1)	72 (21.1)	21 (6.1)	341 (100)	
BSM	*	*	*	*	*			*
BSCtoC	0	1	0	1	0	1	0	3
	1a	4	1	28	0	3	0	36
	1b	0	0	7	0	2	0	9
	1c	0	2	22	2	1	0	27
	2	2	2	30	1	0	0	35
	3	0	0	1	1	0	0	2
	X**	0	0	1	0	0	0	1
	in-situ	3	3	3	0	11	0	20
Total	10 (7.5)	8 (6.0)	93 (69.9)	4 (3.0)	18 (13.5)	0 (0)	133 (100)	
BSC	*	*	*	*	*			*
BSS	0	0	0	1	0	0	0	1
	1a	4	3	15	0	1	0	23
	1b	5	3	37	0	2	1	48
	1c	7	3	69	3	1	0	83
	2	1	1	24	1	0	0	27
	4	1	0	0	0	0	0	1
	in-situ	7	5	6	0	31	0	49
	Total	25 (10.8)	15 (6.5)	152 (65.5)	4 (1.7)	35 (15.1)	1 (0.4)	232 (100)
BSHC	1a	1	0	6	1	1	1	10
	1b	0	1	15	0	0	9	25
	1c	0	0	16	0	0	8	24
	2	0	0	6	0	0	2	8
	3	0	0	1	0	0	1	2
	in-situ	1	2	1	0	3	5	12
	Total	2 (2.5)	3 (3.7)	45 (55.6)	1 (1.2)	4 (4.9)	26(32.1)	81 (100)
Total	57 (7.2)	40 (5.1)	497 (63.2)	16 (2.0)	129 (16.4)	48 (6.1)	787 (100)	

\* Less than 90% of staging data available.

\*\* Primary tumour can not be assessed.

\*\*\* Not recorded in the National monitoring data set

Of the 177 women with DCIS, 113 (63.8%) did not have axillary sampling or dissection performed. The desirable level in the European Guidelines for the proportion of women with DCIS where no axillary dissection was carried out is > 95%.<sup>2</sup> A higher proportion of women had axillary dissection through BreastScreen Auckland and North and BreastScreen HealthCare than screened by BreastScreen Coast to Coast and BreastScreen South.

### 4.3 Breast Reconstruction

Table 4.3 shows the number of women who chose breast reconstruction.

Table 4.3 Breast reconstruction by lead provider for the period 1.12.1998 – 31.12.2000.

Lead provider	Immediate	Decision delayed	No reconstruction	Not stated	Total
BSAN	26 (8.1)	7 (2.2)	285 (89.1)	2 (0.6)	320 (100)
BSM	*	*	*	*	*
BSC to C	6 (4.5)	4 (3.0)	123 (92.5)	0 (0)	133 (100)
BSC	*	*	*	*	*
BSS	18 (7.8)	1 (0.4)	212 (91.8)	0 (0)	231 (100)
BSHC	3 (5.5)	0 (0)	52 (94.5)	0 (0)	55 (100)
Total	53 (7.2)	12 (1.6)	672 (90.9)	2 (0.3)	739 (100)

\* less than 90% of staging data available.

Fifty-three women (7.2%) chose immediate breast reconstruction and 12 women (1.6%) delayed the decision about breast reconstruction.

### 4.4 Radiotherapy

Information about radiotherapy was recorded for 689 women. Of these women, 361 women were offered radiotherapy and 352 accepted the offer. The following forms of treatment were recorded in the national monitoring data set:

- 197 women had breast/chest radiation only;
- 114 women had breast/chest radiation and a radiation boost;
- 25 women had breast/chest radiation and radiation to the regional nodes;
- 15 women had breast/chest and regional nodes radiation and a regional boost
- 1 woman had radiation to regional nodes only.

#### 4.5 Endocrine manipulation

Table 4.5 shows the number of women who underwent endocrine manipulation.

Table 4.5 Endocrine manipulation by lead provider for the period 1.12.1998 – 31.12.2000.

Lead provider	SERM**	Progesto gen	Aromatose inhibitor	Other ***	None	Total
BSAN	104 (33.0)	0 (0)	0 (0)	0 (0)	211 (67.0)	315 (100)
BSM	*	*	*	*	*	*
BSC to C	82 (62.6)	0 (0)	0 (0)	0 (0)	49 (37.4)	131 (100)
BSC	*	*	*	*	*	*
BSS	106 (46.1)	0 (0)	1 (0.4)	1 (0.4)	122 (53.4)	230 (100)
BSHC	21 (42.0)	0 (0)	0 (0)	0 (0)	29 (58.0)	50 (100)
Total	313 (43.1)	0 (0)	1 (0.1)	1 (0.1)	411 (56.6)	726 (100)

\* less than 90% of staging data available.

\*\* Selective estrogen receptor modulator, for example, tamoxifen.

\*\*\* Other – type unspecified.

Forty-three percent of women had selective estrogen receptor modulation therapy.

#### 4.6 Chemotherapy

Of the 696 women with information about chemotherapy recorded, 641 (92.1%) were not offered chemotherapy. Of the 55 women offered chemotherapy 36 (65.5%) women accepted.

## 5. Provision of an appropriate and acceptable service

### 5.1 Time taken providing results of screening.

**Definition** - Date of providing results to women minus date of final screening visit.

**Indicator** - 95% notified within 10 working days.

From the national monitoring data set, the time taken to provide the results of screening to women for each lead provider is shown in Table 5.1.

Table 5.1. Time taken to provide results of screening to women for each lead provider.

Lead Provider	Quarterly % notified within 10 working days* (number of women)	Cumulative % notified within 10 working days Round 2* (number of women)
BSAN	97.9 (7,760)	98.0 (19,187)
BSM	98.6 (4,085)	98.2 (10,932)
BSCtoC	98.2 (4,029)	98.6 (9,609)
BSC	99.0 (3,144)	99.2 (7,701)
BSS	99.4 (5,801)	99.4 (16,136)
BSHC	94.9 (2,096)	92.9 (5,888)
TOTAL	98.3 (26,915)	98.1 (69,453)

\* A five-day working week is used to calculate this indicator.

In this quarter BreastScreen HealthCare continued to increase the percentage of women receiving timely screening results. 98% of women screened in BreastScreen Aotearoa received their results within 10 days.

## 5.2 Time taken from screening visit to first offer of an assessment appointment.

**Definition** - Date of first available appointment offered for assessment minus date of final screening visit.

**Indicator** – At least 90% of women offered an assessment appointment within 14 working days of their final screening mammogram.

The time taken from screening visit to first offer of an assessment appointment is shown in Table 5.2.

Table 5.2. Time taken from screening visit to first offer of an assessment appointment for the women screened by each lead provider.

Lead Provider	Quarterly % offered assessment within 14 working days* (number of women)	Cumulative % offered assessment within 14 working days Round 2* (number of women)
BSAN	84.2 (416)	88.4 (1,072)
BSM	87.0 (154)	87.1 (398)
BSCtoC	67.5 (104)	81.2 (350)
BSC	93.1 (162)	93.5 (431)
BSS	94.0 (373)	95.1 (1,048)
BSHC	67.1 (51)	66.4 (198)
Total	85.6 (1,260)	88.3 (3,497)

\* A five-day working week is used to calculate this indicator.

BreastScreen Central and BreastScreen South have achieved this timeliness indicator. It is important that an appointment for assessment is offered as soon as possible after screening for women who require assessment. Efforts to improve the timeliness of the offer of assessment in BreastScreen Coast to Coast and BreastScreen HealthCare should continue (Recommendation 3).

### 5.3 Time taken from assessment to final diagnostic biopsy.

#### Definition

- Date of needle biopsy minus date of first level assessment.
- Date first offered for open surgical biopsy minus date of first level assessment.

#### Indicator

- At least 90% of women requiring needle biopsy procedure have that procedure completed within 7 days of their assessment.
- At least 90% of women requiring open biopsy procedure are offered that procedure within 3 weeks of their assessment.

The timeliness of completing needle biopsies and offering appointments for open surgical biopsies is shown in Table 5.3.

Table 5.3. Percentage and numbers of women (n) receiving biopsy within 7 days of the date of first level of assessment for needle biopsy and 3 weeks for open surgical biopsy.

Lead Provider	Quarterly		Cumulative Round 2	
	Percentage for which needle biopsy completed within 7 days of assessment (n)	Percentage for which open biopsy offered within 3 weeks of assessment (n)	Percentage for which needle biopsy completed within 7 days of assessment (n)	Percentage for which open biopsy offered within 3 weeks of assessment (n)
BSAN	91.5 (108)	50.0 (12)	84.5 (261)	45.6 (26)
BSM	87.3 (48)	16.7 (1)	86.0 (117)	35.3 (6)
BSCtoC	92.2 (47)	50.0 (1)	94.4 (117)	46.7 (7)
BSC	97.9 (47)	50.0 (5)	94.4 (134)	65.2 (15)
BSS	83.9 (115)	55.6 (5)	85.3 (365)	64.3 (18)
BSHC	100.0 (18)	50.0 (1)	93.2 (55)	69.2 (9)
Total	89.7 (383)	47.2 (25)	87.6 (1,049)	52.9 (81)

Provision of timely needle biopsies is occurring for most women, but there is a problem in offering timely open biopsies. This should be investigated by lead providers and the NSU and remedied (Recommendation 6).

#### 5.4 Time taken from final diagnostic biopsy to reporting assessment results.

**Definition** - Date of reporting final biopsy results to woman minus date of final diagnostic biopsy.

**Indicator** - Results reported to at least 90% of women within 7 days of final diagnostic biopsy.

For all lead providers, the percentage of women receiving results within 7 days of their final diagnostic biopsy is shown in Table 5.4.

Table 5.4. Time taken from final diagnostic biopsy to reporting assessment results for women of each lead provider.

Lead Provider	Quarterly % results within 7 days (number of women)	Cumulative % results within 7 days Round 2 (number of women)
BSAN	83.6 (143)	82.6 (370)
BSM	89.3 (50)	83.6 (117)
BSCtoC	92.3 (48)	88.7 (118)
BSC	85.7 (42)	85.7 (126)
BSS	97.1 (134)	94.6 (406)
BSHC	88.9 (16)	87.3 (55)
Total	89.5 (433)	87.6 (1,192)

It is important to report the results of final biopsies as early as possible because women who have had biopsies are likely to be very anxious while awaiting the results. Most women are receiving these results in a timely fashion, with all lead providers either achieving or almost achieving the performance indicator.

**5.5 Time taken from reporting assessment results to first date offered for primary treatment.**

**Definition** - Date first offered primary treatment minus date of reporting final biopsy results to woman.

**Indicator** – At least 90% of women offered primary treatment within 3 weeks of the final diagnosis being reported to the woman.

Table 5.5 shows the time from reporting assessment results to the first date women were offered primary treatment.

Table 5.5. Time from reporting assessment results to first date offered primary treatment for women of each lead provider.

Lead Provider	Cumulative % women offered primary treatment within 3 weeks 1.12.1998 – 31.12.2000 (n)
BSAN	57.2 (183)
BSM	*
BSCtoC	71.4 (95)
BSC	*
BSS	67.1 (155)
BSHC	81.0 (47)
Total	64.7 (480)

\* less than 90% of staging data available.

The timeliness of the offer of treatment continues to need considerable improvement. Appropriate information and radiology and histology material requested by clinicians to determine treatment options should be made available so that it does not delay the offer of primary treatment. The Ministry of Health and the DHB's should continue to address delays in the provision of treatment such as radiotherapy as the offer of treatment should not be influenced by delays in treatment availability (Recommendation 7).

## References

1. Wilson JMG, Jungner G. Principles and Practice of Screening for Disease. WHO Public Health Papers 1968; No. 34.
2. European Commission (2001). *European guidelines for quality assurance in mammography screening*. (3<sup>rd</sup> ed.) N Perry et al (Eds.) Luxemburg: European Communities.

## **Appendix A**

The BreastScreen Aotearoa Independent Monitoring Group (BSAIMG) provides information routinely to the Ministry of Health (MOH) and lead providers in the form of quarterly and annual reports. Reports include information about the key parameters of BreastScreen Aotearoa, as outlined below. Each report also will make comment on any problems with data collection, the consistency and interpretation of the data, and will make recommendations for improving collection processes.

The reports will assess the data of BreastScreen Aotearoa, and of individual providers, with respect to the National Monitoring Indicator Set (NMIS). The reports will also indicate when revision of the NMIS is required, and the MOH will be informed of these new requirements, together with a justification for any change to the NMIS.

National averages will be stated within each individual lead provider report to enable performance comparisons. Recommendations to lead providers and the MOH will also be included when action is required to improve or maintain the performance of BreastScreen Aotearoa.

Information to be included routinely in quarterly reports is identified with an asterisk. Other information will be provided six-monthly or annually but some results cannot be provided until the end of a screening round. The BSAIMG will also report on other issues of importance as and when they arise.

## **A2.0 KEY PARAMETERS**

These parameters relate to the screening pathway, from registration of eligible women, screening, and assessment, to diagnosis and treatment. Within each stage of the screening pathway certain parameters will be measured. These parameters have been chosen because they can be used as indicators of the acceptability, effectiveness, and efficiency of BSA.

### **A2.1 IDENTIFICATION AND INVITATION**

Identification and invitation of eligible women are essential components of a national breast cancer screening programme. Irrespective of the quality of the other aspects of the programme, a programme that fails to identify and invite a high proportion of the eligible population will also fail to have the desired impact on breast cancer morbidity and mortality. Current identification and invitation processes do not allow the BSAIMG to accurately assess these aspects of the national programme.

#### **A2.1.1 Registration rate \***

This rate will be measured by dividing the number of registered women (from provider records) as a percentage of the number of eligible women according to projected population numbers. Registration rates, with 95% confidence intervals, will be calculated for each provider area, and for the whole country, by age group. The target registration rate is 85% by the end of the prevalence round, and the performance of BSA against this target will be reported after the end of the prevalence screening round.

#### **A2.1.2 Coverage rate \***

Coverage will be measured by dividing the number of women screened (from provider records) by the number of eligible women according to projected population numbers. Coverage rates will be calculated for each provider area, and for the whole country (if data is available from Health Benefits Ltd for private sector screening of women), by age group. Coverage rates for BSA and for the private sector will also be calculated separately. The target is >70% of women aged 50-64 years in BSA. The performance of BSA with respect to this target will be measured at the end of the prevalence screening round.

### **A2.2 SCREENING TEST**

The validity of the screening test will be examined by calculating its sensitivity and specificity. The screening test is the point of entry for a woman with breast cancer. If her cancer is missed, she cannot benefit from early detection. Because the test is not perfect, some women will have false positive or false negative tests. These should be kept to a minimum in order to avoid unnecessary anxiety and investigations, or false reassurance.

### **A2.2.1 Radiation dose/Optical density**

The mean absorbed dose to glandular tissue (MGD) for a test object (routinely collected as part of equipment calibration and maintenance) will be obtained from provider records and reported in each annual report. Optical density, a measure of film density and mammographic quality will be obtained from provider records and reported in each annual report.

### **A2.2.2 Number of films taken \***

The number of films taken for each woman screened will be obtained from provider records. This will be compared against the target of a minimum of 80% of women having 4 or fewer films. Numbers of films per woman will be calculated by provider, and for mobile versus fixed screening centres.

### **A2.2.3 Technical recall rate \***

The number of women recalled for extra films for technical reasons (from provider records) will be divided by the number of women screened (from provider records). Technical recall rates will be calculated according to screening round, by provider, and for mobile versus fixed screening centres. Targets are <3% for mobile units and <0.5% for fixed units.

### **A2.2.4 Technical repeat rate \***

The number of technical repeat films will be divided by the total number of films taken (from provider records). Technical repeat rates will be calculated according to screening round, by provider, and for mobile versus fixed screening centres. The target is <3%.

### **A2.2.5 Sensitivity (estimate)**

Sensitivity will be estimated by dividing the number of women with screen-detected breast cancer by the sum of this number and the number of women with interval cancers in the year following a negative screen. The target is 90%. Sensitivity will be estimated for each screening round by age group and by region and provider.

### **A2.2.6 Specificity (actual)**

Specificity will be calculated after a complete screening round, by dividing the number of women with true negative screening tests by the sum of this number and the number of women with false positive tests. In order to measure the number of women with true negative tests, it will be important to measure the number of women with false negative tests (interval cancers). This information will have to be obtained from provider records (negative tests) and also from the Cancer Registry of the NZHIS (women diagnosed with interval cancers following a negative test). Specificity will be calculated by age group and by region and provider. The target is >93%.

### **A2.2.7 Specificity (approximate)\***

Specificity can be estimated before the second screening round by dividing all negative tests (including false negatives) by the sum of all negatives and false positives. This is an adequate estimate of specificity (although false negatives have been included in the numerator and the denominator) because the number of false negatives is very small in relation to the number of true negatives. This information will be obtained from provider records. Specificity will be estimated by age group and by provider. The target is >93%.

### **A2.2.8 Positive predictive value (PPV)**

The number of women with breast cancer diagnosed through the screening programme will be divided by the sum of this number and the number of women with false positive screening tests (i.e.: the number of women with screen-detected cancer as a percentage of all women referred for assessment). This information will be obtained from provider records. The positive predictive value will be calculated by screening round, by age group, and by region and provider, and will be reported in each annual report. The target PPV is  $\geq 9\%$ .

## **A2.3 ASSESSMENT**

Women with positive screening tests will be referred for assessment. The number referred will be determined by the underlying prevalence of breast cancer in the population and by the sensitivity and specificity of the screening test. Ideally the assessment process will determine which women with positive screening tests actually have breast cancer and require treatment, while minimising unnecessary anxiety and investigations in the other women.

### **A2.3.1 Assessment rate \***

The assessment rate will be calculated by dividing the number of women referred for assessment by the total number of women screened. Assessment rates will be calculated by screening round, by age group, and by provider. Targets for the prevalence screening round are <7% (expected) and <10% (minimum). Targets for the incidence screening rounds are <4% (expected) and <5% (minimum). These targets will not be measured until after the end of each screening round.

### **A2.3.2 False positive rate of mammograms \***

The false positive rate will be calculated by dividing the number of women with false positive screening results (women referred for assessment but who do not have breast cancer diagnosed as a result) divided by the total number of women screened. This information will be obtained from provider records. The false positive rate will be calculated by age group, and by provider. Targets for the prevalence screening round are <6% (expected) and <9% (minimum). Targets for the incidence screening rounds are <3% (expected) and <4% (minimum). These targets will not be measured until after the end of each screening round

### **A2.3.3 Needle biopsy rate \***

The needle biopsy rate will be calculated by dividing the number of women undergoing FNA divided by the number of women screened. This information will be obtained from provider records. The needle biopsy rate will be calculated by age group, and by provider. No target has been set for the needle biopsy rate.

### **A2.3.4 Benign biopsy weight**

The weight of benign biopsy is measured to ensure 80% weigh less than 20g. The rate is calculated by the number of benign biopsies, which weigh less than 20g as a percentage of the number of benign open biopsies.

### **A2.3.5 Open surgical biopsy rate \***

The open surgical biopsy rate will be calculated by dividing the number of women undergoing open surgical biopsy divided by the number of women screened. This information will be obtained from provider records. The open surgical biopsy rate will be calculated by age group, and by provider. The target for the open surgical biopsy rate is 1% or less.

### **A2.3.6 Benign biopsy rate \***

The benign biopsy rate will be calculated by dividing the number of women with benign open surgical biopsy divided by the number of women screened. This information will be obtained from provider records. The benign biopsy rate will be calculated by age group, and by provider. The targets are <10 per 1,000 women screened in the prevalence round and <5 per 1,000 women screened in the incidence rounds. The performance of BSA with respect to these targets will be summarised in the annual reports.

## **A2.4 DIAGNOSIS**

The number of women diagnosed with breast cancer as a result of BSA will be partly determined by the underlying prevalence of breast cancer in the eligible population, but also by the quality of the screening and assessment procedures. After diagnosis, the size and node status of cancers detected can be used as an indicator of the effectiveness of BSA.

### **A2.4.1 Pre-operative diagnosis rate**

This will be calculated by dividing the number of women whose breast cancers were diagnosed by needle biopsy by the total number of women with breast cancer diagnosed through the screening programme. This information will be obtained from provider records. The target is  $\geq 70\%$ . The pre-operative diagnosis rate will be calculated by age group, and by region and provider, and will be reported annually.

#### **A2.4.2 Cancer detection rate \***

The cancer detection rate will be calculated by dividing the number of women with breast cancer diagnosed through the screening programme by the number of women screened. This information will be obtained from provider records. The cancer detection rate and 95% confidence interval will be calculated by age group, and by region and provider. The targets are  $\geq 6$  per 1,000 women screened in the prevalence round and  $\geq 3$  per 1,000 women screened in the incidence rounds. The performance of the programme with respect to these targets will be reported in the annual reports.

In the prevalent round the cancer detection rate is expected to be at least three times the expected breast cancer incidence rate in the absence of screening. In the incident round it is expected to be at least 1.5 times the expected breast cancer incidence rate in the absence of screening. The expected incidence rate in the absence of screening will be estimated based on historical data from the Cancer Registry, taking into account relevant demographic trends.

#### **A2.4.3 Invasive cancer rate**

This will be calculated by dividing the number of women with invasive breast cancer detected through the screening programme by the number of women screened. This information will be obtained from provider records. The invasive cancer rate and 95% confidence interval will be calculated by age group, and by region and provider, and reported six-monthly. The target is 4.8 per 1,000 women screened.

#### **A2.4.4 Small invasive cancer detection rate**

As above, but for cancers  $\leq 10$ mm. The target is 1.2 per 1,000 women screened per incident round.

#### **A2.4.5 Proportion of women diagnosed with nodal involvement**

The proportion of women with nodal involvement will be calculated by dividing the number of women with breast cancer involving axillary nodes diagnosed through the screening programme by the total number of women diagnosed with breast cancer diagnosed through the screening programme. This information will be obtained from provider records. The proportion will be calculated by age group, and by region and provider, and will be reported six-monthly. The target is that at least 70% of women with cancers detected by BSA should be node negative (i.e. less than 30% node positive).

#### **A2.4.6 Proportion of DCIS**

As above, but for DCIS. The target is that 10-25% of all cancers detected by BSA should be DCIS.

#### **A2.4.7 Interval cancer rate**

The interval cancer rate will be calculated by dividing the number of women with breast cancer detected within 12 months of a negative screen by the total number of women with negative screening tests during that screening round. This information will be obtained from the providers and from the Cancer Registry. The interval cancer rate, and 95% confidence interval, will be calculated by screening round and by region, and reported annually. The targets are <0.6 per 1,000 women screened within 1 calendar year of a negative screen, and <1.2 per 1,000 women screened between the 1<sup>st</sup> and 2<sup>nd</sup> year of a negative screen.

#### **A2.4.8 Proportion of women with cancers detected by the programme**

The proportion of women with cancers detected by the programme will be calculated by dividing the number of women with breast cancer diagnosed through the programme by the total number of women in the eligible age-range diagnosed with breast cancer in a given period. This information will be obtained from the providers and from the Cancer Registry. The proportion will be calculated by screening round, by age, and by region, and reported annually.

### **A2.5 TIMELINESS**

The following relate to the requirement for the programme to ensure prompt and appropriate treatment for women who take part in the National Breast Cancer Screening Programme. The information will be collected from the providers, and where appropriate, from NZHIS. The dates of screening, providing results of screening, assessment, providing assessment results, date of biopsy, providing biopsy result, date of final diagnostic biopsy, result of final biopsy, and date first offered for primary treatment will be collected. The time taken for the following indicators will be calculated according to screening round and by region. The indicators will be reported quarterly.

#### **A2.5.1 Time to recall after a negative screen**

Eligible women should be offered mammograms at two-yearly intervals. The percentage of eligible women recalled within 24 months of their previous screen will be measured.

#### **A2.5.2 Time taken to provide results of screening \***

The target is for 95% of women to be notified within 10 working days of the screening examination.

#### **A2.5.3 Time taken from screening visit to first assessment appointment \***

The target is for 90% of women to be offered their assessment appointment within 14 working days of their final mammogram.

**A2.5.4 Time taken from final assessment to final diagnostic biopsy \***

The target is for 90% of women requiring needle biopsy to have that procedure completed within 7 days of their assessment, and for 90% of women requiring open surgical biopsy to be offered that procedure within 3 weeks of their assessment.

**A2.5.5 Time taken from final diagnostic biopsy to reporting assessment results \***

The target is that 90% of women should have received their results within 7 days of their final diagnostic biopsy.

**A2.5.6 Time taken from reporting assessment results to first date offered for primary treatment\***

The target is that 90% of women are offered primary treatment within 3 weeks of the final diagnosis being reported to them.

### **A3.0 QUARTERLY REPORT PROCESS**

- A3.1** BSAIMG receives cleaned data in agreed format from NZHIS within one month of quarter end.
- A3.2** BSAIMG drafts quarterly report as agreed proforma within two months of quarter end.
- A3.3** BSAIMG discusses the draft with lead providers (own report) before it is finalised. Subsequently it was decided by the National Screening Unit (NSU) that communication between lead providers and BSAIMG would occur via the NSU. Lead providers send feedback about quarterly reports to the NSU and the feedback is collated and NSU feedback added, as in A3.4 below.
- A3.4** MOH and lead providers' review draft reports and feed back (via the NSU) within one month of receiving reports.
- A3.5** BSAIMG assesses feedback and finalises its report.
- A3.6** BSAIMG electronically transfers final quarterly report to the MOH within two weeks of receiving feedback. If a serious issue becomes apparent it will be discussed with the MOH prior to this transfer.
- A3.7** MOH circulates reports to each lead provider (own report).
- A3.8** BSAIMG forwards a copy of the report directly to the MOH Screening Advisory Group chair.

## **A4.0 DATA**

- A4.1** Lead providers have responsibility to collect data in such a way as to ensure that an accurate timely and consistent set of health data is available for comparative purposes (Chapter 1, DMM p1.5).
- A4.2** Lead providers have responsibility to adhere to the minimum standards for the collection and management of data as set out in Chapter 2, Minimum Standards, BreastScreen Aotearoa, and DMM.
- A4.3** The funder, lead providers, and BSAIMG are to adhere to the guiding principles of data collection and management described in the document “NZHIS Guide to Data Requirements”.
- A4.4** BSAIMG will utilise the same title, definition, numbering and lettering for indicators as outlined in the DMM.
- A4.5** All quantitative information will be provided directly to BSAIMG by NZHIS as agent for the NSU.
- A4.6** BSAIMG will utilise projected population figures for calculation of the registration rate and population coverage.
- A4.7** Quarterly and annual reports will include women screened and assessed in that quarter who have a screening and final diagnosis recorded. Reports may include details of a previous screening quarter’s assessment data – if this occurs it will state which screening quarter the assessment data relates to.
- A4.8** Round reports will include all women screened and assessed in a defined 24-month period.

## Appendix B

### Population Projections BreastScreen Aotearoa (2001/2002)

#### Population denominator data

The eligible populations in these reports have been calculated from projected resident populations in each lead provider district, provided by Statistics New Zealand. The projections are based on the New Zealand Census 1996, assuming medium fertility, medium mortality, medium inter-ethnic mobility and medium migration. The populations have been calculated as the mean of the projected populations for the years 2001 and 2002.

Table 1. Population projections BreastScreen Aotearoa (2001/2002).

<b>Population Projections BreastScreen Aotearoa (2001/2002)</b>	
<b>BreastScreen Auckland &amp; North</b>	104,002
<b>BreastScreen Midland</b>	48,051
<b>BreastScreen Coast to Coast</b>	40,792
<b>BreastScreen Central</b>	32,664
<b>BreastScreen South</b>	54,074
<b>BreastScreen HealthCare</b>	22,215
<b>TOTAL</b>	<b>301,798</b>
<b>70% coverage over two years</b>	<b>211,259</b>

Table 2. Population projections (2001/2002) by age group.

<b>Population Projections (2001/2002) - Summary by age group</b>				
	<b>50-54</b>	<b>55-59</b>	<b>60-64</b>	<b>Total</b>
<b>BreastScreen Auckland &amp; North</b>	42,824	34,287	26,891	104,002
<b>BreastScreen Midland</b>	18,629	15,692	13,730	48,051
<b>BreastScreen Coast to Coast</b>	16,181	13,146	11,465	40,792
<b>BreastScreen Central</b>	13,430	10,675	8,559	32,664
<b>BreastScreen South</b>	21,878	17,432	14,764	54,074
<b>BreastScreen HealthCare</b>	8,983	7,015	6,217	22,215
<b>Total</b>	<b>121,925</b>	<b>98,247</b>	<b>81,626</b>	<b>301,798</b>

## Ethnic group denominators

The denominators for each ethnic group are also taken from the census and calculated from projected resident populations in each lead provider district, provided by Statistics New Zealand. Statistics New Zealand utilise a confidentiality assurance technique of randomly rounding census statistics to base three. This enables the greatest amount of census data to be released without compromising the privacy of individual responses. As a consequence the ethnicity denominator in Table 3 differs from the overall coverage denominator in Table 1.

In the census it is possible to choose more than one ethnic group. Where more than one category has been chosen, priority is given to certain ethnic groups for the purposes of classification by the New Zealand Health Information Service (NZHIS). Thus, if a woman chooses more than one category and one of these is Maori, she is counted as Maori.

Table 3. Population projections (2001/2002) by ethnicity.

<b>Population Projections (2001/2002) - Summary by ethnicity</b>				
	<b>Maori</b>	<b>Pacific</b>	<b>Other</b>	<b>Total</b>
<b>BreastScreen Auckland &amp; North</b>	8,860	6,655	89,485	10,5000
<b>BreastScreen Midland</b>	7,060	483	40,875	48,418
<b>BreastScreen Coast to Coast</b>	5,220	338	35,095	40,653
<b>BreastScreen Central</b>	2,330	1,498	29,225	33,053
<b>BreastScreen South</b>	2,110	365	51,645	54,120
<b>BreastScreen HealthCare</b>	950	113	21,265	22,328
<b>Total</b>	26,530	9,452	267,590	<b>303,572</b>

The priority for multiple ethnic group reporting is shown below:

Table 4 Multiple ethnic group reporting priority list.

<b>Ethnic group</b>	<b>Priority for multiple ethnic group reporting</b>
European not further defined	20
NZ European / Pakeha	21
Other European	19
Maori	1
Pacific Island not further defined	9
Samoan	7
Cook Island Maori	6
Tongan	5
Niuean	4
Toleauan	2
Fijian	3
Other Pacific	8
Asian not further defined	14
South East Asian	10
Chinese	12
Indian	11
Other Asian	13
Middle Eastern	17
Latin American / Hispanic	15
African	16
Other	18
Not stated	99

Source: New Zealand Health Information Service. Data Dictionary Appendix  
Revision 4.3. Wellington: NZHIS, 1997.