

BreastScreen Aotearoa
MONITORING REPORT No. 12

**Women screened
between 1 January and 30 June 2002**

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

19 December 2002

Technical Report No. 46
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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 performance indicators assessed by the monitoring group were specified by the Ministry of Health. The list of agreed performance indicators to be included in six-monthly 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 28 August 2002. The draft report was written in September and October 2002 and was sent to the Ministry of Health on 23 October 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

This brief foreword describes the process used by BSAIMG to produce these reports.

Data are sent monthly 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 the National Screening Unit (NSU). The NSU runs further checks, before encrypting the NHI numbers and forwarding the data to BSAIMG. These data are analysed and a draft six-month 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 report. At least one member of the NSU attends this meeting. Responses to lead provider comments are included in the final report, or if they are not to be included in the report, a response to every comment is forwarded from BSAIMG to NSU. Members of the NSU attend a meeting with the BSAIMG subgroup, before the full BSAIMG meeting, to discuss issues that arise from monitoring of BreastScreen Aotearoa by BSAIMG.

Executive Summary

This six-month report relates to women screened during 1 January to 30 June 2002, and also includes data on assessment and investigations carried out for these women following their screening mammograms. Treatment data for women diagnosed with breast cancer and DCIS at screening during 1 December 1998 to 30 September 2001 are also included in this report. Information on treatment is less recent because of the time it takes for treatment to occur and for the data to be collected.

In this six-month report, an 18-month cumulative total for coverage during the period 1 January 2001 to 30 June 2002 has also been provided. Some 95% confidence intervals have also been included, at the request of the NSU.

In the six months from 1 January to 30 June 2002, 50,348 women were screened in BreastScreen Aotearoa. This was 16.6% of the eligible women. To meet the performance indicator for coverage of 70% of women in each two-year screening round, 17.5% of women need to be screened every six months. Two lead providers, BreastScreen South and BreastScreen HealthCare, achieved the expected coverage and this is a very encouraging result. Coverage among Maori and Pacific women continued to be lower than for other women in most regions, and this needs to be investigated further by lead providers and the NSU of the Ministry of Health.

Most women screened in BreastScreen Aotearoa are now undergoing incidence screening, so they have already been screened once since the start of BreastScreen Aotearoa. As expected, the referral to assessment and false positive rates are lower for these women than for women screened for the first time. Incidence round specificity was over 96%, and false positive rates were less than 4% for all lead providers. These are excellent results, suggesting that false positive results are being kept to a minimum.

Among women screened from the start of BreastScreen Aotearoa until 30 September 2001, invasive cancer detection rates were higher than the expected indicator for all lead providers. Over 70% of the women diagnosed with breast cancer in BreastScreen Aotearoa had no nodal involvement. Compared with the stage distribution at diagnosis of breast cancer for women in New Zealand from 1979-88 (before the introduction of screening), there has been a shift to earlier stage at diagnosis for women diagnosed through BreastScreen Aotearoa. The stage distribution for cancers detected at prevalence screening in BreastScreen Aotearoa is similar to the stage distribution for prevalence screening in the Swedish Two-County Trial. These are encouraging results for BreastScreen Aotearoa.

The timeliness of reporting the results of screening to women also continues to improve. All lead providers achieved the indicator of 95% of women being notified of their screening results within ten days, and overall 97.5% of women screened received their results within ten working days.

The timeliness of offering assessment procedures, providing results from assessment, and providing treatment continues to need attention. In particular, the timeliness of offering open biopsies to those women who need them should be improved. Women diagnosed with breast cancer in the North Island face long delays before receiving radiotherapy, and for many women throughout New Zealand the time from receiving a diagnosis of breast cancer in BreastScreen Aotearoa and surgery is longer than three weeks. This requires urgent attention.

Recommendations

1. Attaining 70% or greater coverage of women aged 50-64 should continue to be a priority for BreastScreen Aotearoa, especially for Maori and Pacific women, where coverage is lower than for other women.
2. The National Screening Unit should continue to advocate for the introduction of a population register, because this would ensure that eligible women received invitations to participate in BreastScreen Aotearoa, and would be likely to increase coverage.
3. Consistency in the definition of technical recalls and technical repeats between lead providers is necessary. Of particular importance is the method by which films are rejected and how this process is recorded in the National Monitoring Data Set. It is recommended that the National Screening Unit and lead provider data managers investigate the definitions used for technical repeats and technical recalls ensuring consistency between lead providers, so that the technical recall and technical repeat rates provide accurate and useful information for lead providers.
4. Attention should be paid to timeliness indicators. It is encouraging to note that over 95% of women receive their results from screening within ten working days, but attention should be paid to other indicators, such as time to an appointment for assessment, time to open surgical biopsy, and time to primary treatment. The reasons for any delays between diagnosis and treatment should be investigated.
5. Women diagnosed with breast cancer in the North Island have long delays before radiotherapy. The National Screening Unit should advocate for increased radiotherapy services so that women do not have to wait for completion of treatment.
6. Lead providers differ in their process for staging, with some using pMX or pNX where others would use pM0 or pN0. It is recommended that the National Screening Unit and lead providers standardise the recording of nodal and metastatic status.

Data Summary

The following tasks were undertaken:

1. Investigate and preprocess duplicate records, to explain and minimise discrepancies between table totals.
2. Investigate missing data, and examine its influence on reported indicators.
3. Keep print screens for clarification if required.

The following issues were encountered:

Duplicate dates of birth (Nine women)

The date of birth corresponding to the lead provider with whom screening occurred in the reporting period, was used.

Ethnicities (389 women)

Three hundred and eighty nine women had more than one ethnicity recorded in the NMDS. The NMDS does not allow multiple ethnicity recordings per women by lead provider. If women transfer to another lead provider they may change their ethnicity and both will be recorded in the NMDS.

Multiple screens per woman: early rescreening

Small numbers of women had more than one screening episode in the reporting interval. Records of these women were treated as data artifacts in previous reports, and were excluded from the analysis. In this report, these records are taken at face value and included in the cross-tabulations. Their inclusion results in small discrepancies between grand totals across various tables, such as tabulations by age or screening unit, for the following reasons:

- (1) Some of these women (fewer than ten) changed age interval between screening episodes.
- (2) Some women (fewer than ten) were screened at a fixed unit, and later at a mobile unit, or vice versa.
- (3) Some women (fewer than ten) had their first (prevalent) screening episode, plus a later (incident) screening episode, during the reporting interval.

Data not recorded in mandatory data fields

The date of notification of screening results was not recorded for nineteen women. These women were excluded from the analysis in Section 5.1 (Time taken to provide results of screening).

Clarification of "working days" in Section Five

Weekdays (Monday to Friday) were regarded as working days. Time from a procedure on one day to results given on the same day, was defined as zero elapsed working days. Results being notified the day after a procedure was under taken constitute one elapsed working day.

Examples:

Results given on Monday, for a procedure on the previous Friday, constitute one elapsed working day.

Results given on Thursday, for a procedure on the previous Tuesday, constitute two elapsed working days.

Table 1. Summary of Lead Provider and BreastScreen Aotearoa results for indicators from 1 January 2001 to 30 June 2002.

Indicator	LEAD PROVIDERS						
	BSAN	BSM	BSCtoC	BSC	BSS	BSHC	BSA
Coverage (%) for 1 January 2001 to 30 June 2002 <i>- Indicator > 70% (>52.5% the period 1.1.01 to 30.6.02)</i>							
Overall	40.1	44.0	47.9	47.9	58.9	55.4	47.1
Maori	33.1	30.4	30.8	31.2	39.1	31.9	32.2
Pacific	25.4	30.0	34.0	17.2	43.6	27.4	25.4
Other	41.5	46.4	50.3	50.7	59.3	55.5	49.0
(not stated)	334	21	83	30	268	237	973
Technical recall (%) <i>- Indicator (Fixed < 0.5%; Mobile <3%)</i>							
Fixed	0.3	0.2	0.1	1.0	0.4	0.5	0.4
Mobile	2.0	4.2	5.0	5.9	1.0	1.0	3.3
Technical repeat (definition 2) (%) <i>Indicator <3%</i>							
Fixed	1.0	0.9	0.9	1.7	1.2	1.5	1.1
Mobile	0.3	0.6	1.7	0.3	0.4	0.2	0.6
Assessment (%) <i>Indicator – prevalence screen – indicator is <10%, expected value is <7%</i> <i>- incidence screen - indicator is <5%, expected value is <4%</i>							
Prevalence	8.9	6.5	6.8	9.7	9.3	9.3	8.5
Incidence	4.6	3.0	3.2	3.7	4.3	2.1	3.8
False positive rate (%) <i>Indicator – prevalence round indicator is <9%, expected value <6%</i> <i>-- incidence round, indicator is <4%, expected indicator <3%</i>							
Prevalence	7.6	5.7	5.7	8.9	8.6	8.5	7.5
Incidence	3.9	2.4	2.6	3.0	3.7	1.7	3.2
Open surgical biopsy rate (%) <i>Indicator <1%</i>							
	0.3	0.2	0.1	0.3	0.1	0.2	0.2
Benign biopsy weight (%) <i>Indicator 80% or more of benign open biopsies should weigh <20g</i>							
	53.9	52.2	*	78.8	57.9	87.5	61.3

....continued

Table 1 (continued).
Summary of Lead Provider and BreastScreen Aotearoa results for indicators from 1 January 2001 to 30 June 2002.

Indicator	LEAD PROVIDERS						
	BSAN	BSM	BSCtoC	BSC	BSS	BSHC	BSA
Needle biopsy rate (%)							
<i>Indicator – none; *Women who have both FNA and core needle procedures.</i>							
FNA only	0.2	0.2	0.1	0.1	0.7	0.3	0.3
Core needle only	1.1	1.2	1.3	1.5	1.5	0.5	1.2
Both*	0.1	0	0	0.1	0.1	0.1	0.1
Other	0.1	0	0	0	0	0	0
Total	1.6	1.4	1.4	1.8	2.3	0.9	1.7
Specificity (%)							
<i>Indicator >93%</i>							
Prevalence	92.3	94.2	94.2	91.0	91.4	91.4	92.4
Incidence	96.0	97.5	97.3	97.0	96.2	98.3	96.8
Detection rate of DCIS and invasive cancer (per thousand women screened)							
<i>Indicator – prevalence - ≥ 6 per 1000 women screened – incidence - ≥ 3 per 1000 women screened</i>							
Prevalence	11.2	6.5	9.4	7.4	5.9	6.6	8.4
Incidence	5.7	5.2	5.0	6.8	5.6	4.0	5.5
Time taken providing results of screening (%)							
<i>Indicator – at least 95% notified within 10 days</i>							
	96.8	97.6	98.5	98.4	99.1	95.0	97.7
Time taken from screening visit to first offer of an assessment appointment (%)							
<i>Indicator – at least 90% offered an assessment appointment within 14 working days of their final screening visit</i>							
	82.0	88.5	79.1	94.2	93.7	69.7	86.2
Time taken from assessment to final diagnostic biopsy (%)							
<i>Indicator 1 – at least 90% of women requiring needle biopsy procedure have that procedure completed within 7 days of their assessment</i>							
	82.6	79.3	93.9	95.1	84.1	89.7	85.8
<i>Indicator 2 – at least 90% of women requiring open biopsy procedure offered that procedure within 3 weeks of their assessment</i>							
	36.3	29.4	33.3	56.4	67.4	81.5	47.5
Time taken from final diagnostic biopsy to reporting assessment result (%)							
<i>Indicator – results reported to at least 90% of women within 7 days of final diagnostic biopsy</i>							
	82.4	76.2	87.6	84.5	96.5	88.8	86.6
Time taken from reporting assessment results to first date offered for primary treatment (%)							
<i>Indicator – at least 90% of women offered primary treatment within 3 weeks of the final diagnosis being reported to the women</i>							
	56.5	65.3	73.3	81.3	70.2	81.7	67.3

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.

The data provided in the national monitoring data set do 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 figures. 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).

1.2 Registration rate – ethnicity

See Section 1.1 above.

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.

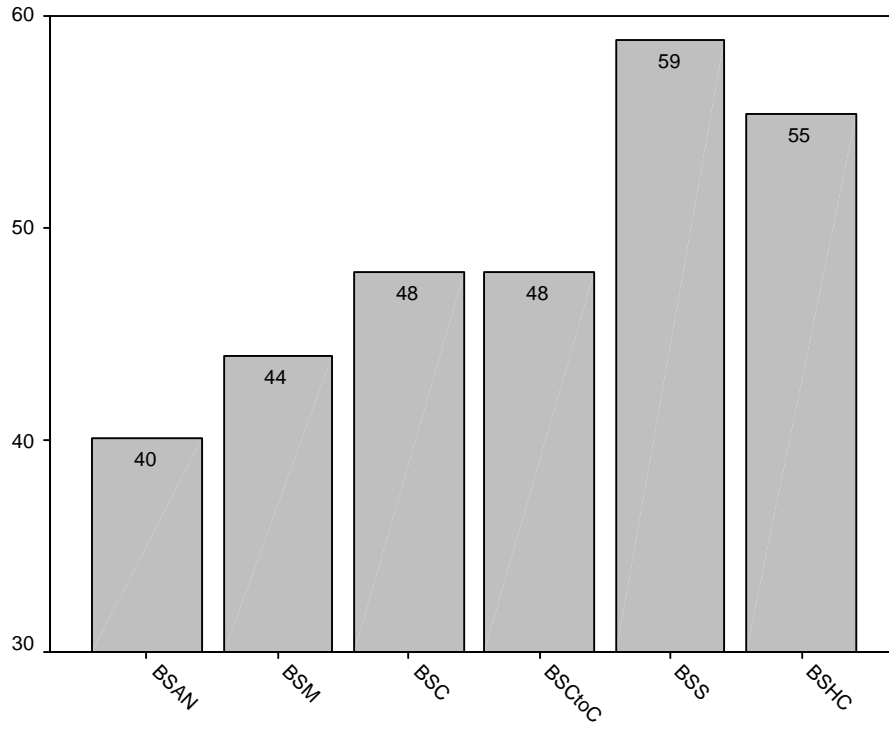
Table 1.3. Overall number of women screened and per cent coverage by lead provider.

Lead provider	Number screened 1.1.2002 – 30.6.2002		Rolling 24 month total (%) 1.7.2000 – 30.6.2002		Cumulative number screened 1.1.2001 – 30.6.2002	
	n	%	n	%	n	%
BSAN	15,142	14.4	48,896	47.0	42,112	40.1
BSM	7,252	15.0	28,628	59.6	21,293	44.0
BSCtoC	6,626	16.3	23,106	56.6	19,473	47.9
BSC	5,373	16.3	18,064	55.3	15,824	47.9
BSS	11,605	21.4	40,281	74.5	31,872	58.9
BSHC	4,350	19.5	15,191	68.4	12,380	55.4
Total	50,348	16.6	174,166	57.7	142,954	47.1

* All percentages calculated using the estimated population for the 2001/2002 screening round.

From the national monitoring data set, 50,348 women had a screening mammogram as part of BreastScreen Aotearoa for the six-month period up to June 30, 2002. Overall, approximately 47% of all women aged 50-64 years have been screened in the eighteen months since the commencement of Round 2. Assuming constant screening rates over 24 months, it would be expected that at least 17.5% of women should be screened in 6 months, and 52.5% of women should be screened in 18 months to reach the target of 70% screened in two years. BreastScreen South and BreastScreen HealthCare have exceeded the expected coverage rate for the six-month period and are the only lead providers on target to reach the 70% coverage indicator for the two-year period (Figure 1).

Figure 1 Coverage (%) by lead provider 1 January 2001-30 June 2002 (52.5% expected).



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 below for the six-month period (Table 1.4a) and for cumulative numbers of women screened (Table 1.4b).

Table 1.4.a. Age specific number of women screened and coverage by lead provider for the period 1.1.2002 – 30.6.2002.

Lead provider	Number screened 1.1.2002 – 30.6.2002 (per cent of projected population)							
	50-54		55-59		60-64		Total	
BSAN	6,080	14.2%	4,991	14.6%	4,074	15.2%	15,145	14.6%
BSM	2,508	13.5%	2,455	15.6%	2,289	16.7%	7,252	15.1%
BSCtoC	2,593	16.0%	2,143	16.3%	1,890	16.5%	6,626	16.2%
BSC	2,247	16.7%	1,724	16.1%	1,403	16.4%	5,374	16.5%
BSS	4,709	21.5%	3,686	21.1%	3,210	21.7%	11,605	21.5%
BSHC	1,628	18.1%	1,392	19.8%	1,334	21.5%	4,354	19.6%
Total	19,765	16.2%	16,391	16.7%	14,200	17.4%	50,356	16.7%

Assuming constant screening rates over 24 months, it would be expected that, on average, at least 17.5% of women in each five-year age group should be screened in each six-month period. For the six-month period, only BreastScreen South and BreastScreen HealthCare have achieved the expected coverage in each age group.

Table 1.4.b. Age specific number of women screened and cumulative Round 2 coverage (from 1.1.2001) by lead provider.

Lead provider	Cumulative number screened – Round 2. (per cent of projected population)							
	50-54		55-59		60-64		Total	
BSAN	16,819	39.3%	13,841	40.4%	11,453	42.6%	42,113	40.5%
BSM	7,846	42.1%	6,567	41.8%	6,880	50.1%	21,293	44.3%
BSCtoC	7,460	46.1%	6,318	48.1%	5,695	49.7%	19,473	47.7%
BSC	6,279	46.8%	5,291	49.6%	4,255	49.7%	15,825	48.4%
BSS	13,256	60.6%	9,982	57.3%	8,637	58.5%	31,875	58.9%
BSHC	4,757	53.0%	4,014	57.2%	3,613	58.1%	12,384	55.7%
Total	56,417	46.3%	46,013	46.8%	40,533	49.7%	142,963	47.4%

* Numbers differ from those in Table 1.3 due to some women attending for early rescreening and being present in two age categories.

Assuming constant screening rates over 24 months, it would be expected that at least 52.5% of women should be screened in 18 months to attain 70% coverage at 24 months. BreastScreen South and BreastScreen HealthCare have achieved the expected coverage in each age group during the 18 months since 1 January 2001.

1.5 Coverage - ethnicity

The number of women screened and coverage by ethnic group for the first six months of 2001 (Table 1.5a) and cumulative numbers (Table 1.5b) are shown below.

Table 1.5a. The number of women screened by ethnic group and per cent coverage for the period 1.1.2002 – 30.6.2002.

Lead provider	Number screened 1.1.2002 – 30.6.2002 (% of projected population)								
	Maori		Pacific		Other		Not stated	Total	
BSAN	1,245	14.1%	590	8.9%	13,187	14.7%	120	15,142	14.4%
BSM	763	10.9%	20	4.1%	6,460	15.8%	5	7,252	15.0%
BSCtoC	612	11.7%	48	14.2%	5,942	16.9%	24	6,626	16.3%
BSC	293	12.6%	99	6.6%	4,963	17.0%	18	5,373	16.3%
BSS	292	13.8%	60	16.4%	11,157	21.6%	96	11,605	21.4%
BSHC	116	12.2%	11	9.7%	4,188	19.7%	35	4,350	19.5%
Total	3,321	12.5%	828	8.8%	45,901	17.2%	298	50,348	16.6%

Assuming constant screening rates over 24 months, it would be expected that at least 17.5% of women should be screened in 6 months, to reach the target of 70% screened in two years. Coverage of Maori and Pacific women is lower than this in all lead provider regions. Coverage is considerably less than expected for Pacific women in the BreastScreen Auckland and North (8.9%), BreastScreen Midland (4.1%) and BreastScreen Central (6.6%) regions.

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

Lead provider	Cumulative number screened – Round 2 (per cent of projected population)								
	Maori		Pacific		Other		Not stated	Total	
BSAN	2,928	33.0%	1,688	25.4%	37,159	41.5%	337	42,112	40.1%
BSM	2,142	30.3%	145	30.0%	18,984	46.4%	22	21,293	44.0%
BSCtoC	1,609	30.8%	114	33.7%	17,667	50.3%	83	19,473	47.9%
BSC	726	31.2%	258	17.2%	14,810	50.7%	30	15,824	47.9%
BSS	825	39.1%	159	43.6%	30,620	59.3%	268	31,872	58.9%
BSHC	303	31.9%	31	27.4%	11,807	55.5%	239	12,380	55.4%
Total	8,533	32.2%	2,395	25.4%	131,047	49.0%	979	142,954	47.1%

Assuming constant screening rates over 24 months, it would be expected that at least 52.5% of women should be screened in 18 months to reach the target of 70% screened in two years. Overall, coverage for Pacific and Maori women is lower than that of “Other” women for all lead providers. Attaining 70% or greater coverage of women aged 50-64 should continue to be a priority for BreastScreen Aotearoa, especially for Maori and Pacific women, where coverage is lower than for other women (Recommendation 1).

Coverage is recognised as one of the most important determinants of a screening programme's ability to reduce breast cancer mortality. At present lead providers do not have access to registers of eligible women, which makes it difficult for them to ensure that all eligible women are invited for screening (although BreastScreen South and BreastScreen HealthCare, in partnership with local general practitioners, have made very effective use of general practice age-sex registers). It is encouraging to note that the Ministry of Health has implemented a "Population Register Project". With a population register, it would be possible to ensure that eligible women receive invitations to screening. It would also be possible to calculate participation rates among invited women. This information would make it easier to develop appropriate strategies to increase coverage, for instance if large numbers of women were declining invitations to screening, it would be possible to investigate ways of making the programme more acceptable to women. BSAIMG supports the recommendation of the independent review of BreastScreen Aotearoa¹ that the NSU should continue to advocate for the introduction of a population register (Recommendation 2).

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 for the period 1.1.2002 – 30.6.2002.

Lead Provider	1.1.2002 – 30.6.2002 (%)		Cumulative rate (%)	
	Fixed	Mobile	Fixed	Mobile
BSAN	84.0	97.6	84.2	94.8
BSM	88.8	79.6	88.3	80.9
BSCtoC	86.5	74.8	88.6	82.1
BSC	76.1	77.6	76.7	82.8
BSS	83.8	82.5	84.2	82.8
BSHC	78.5	89.5	76.3	82.1
Total	83.9	83.6	84.1	84.3

The proportion of women having four films at screening may be influenced by lead providers' choice of large or small films for screening.

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 recommended to be 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	6 months (1.1.2002 – 30.6.2002)		Cumulative rate (1.1.2001 – 30.6.2002)	
	Fixed	Mobile	Fixed	Mobile
BSAN	0.4%	1.0%	0.3%	2.0%
BSM	0.2%	4.1%	0.2%	4.2%
BSCtoC	0.1%	5.5%	0.1%	5.0%
BSC	1.0%	5.9%	1.0%	5.9%
BSS	0.5%	1.9%	0.4%	1.0%
BSHC	0.3%	0.7%	0.5%	1.0%
Total	0.4%	3.3%	0.4%	3.3%

The technical recall rate reflects the number of women who are recalled to either the fixed or mobile screening site for replacement or additional films. Recalls may be due to technical issues, which occur when the films are taken, or during processing of the films. Lead providers have indicated that they have regular quality assurance processes in place to review films and the reasons for technical recalls. It is important to keep technical recall rates low so that being recalled does not inconvenience women.

The recall rates at both the fixed and mobile screening sites continue to be higher than expected for BreastScreen Central. Although the rates have reduced from those reported in Monitoring Report no 11, the rates continue to be higher than expected. BreastScreen Midland and BreastScreen Coast to Coast also had higher than expected technical recall rates for their mobile screening sites during the six month reporting period 1/1/02-30/6/02, and in the 18 months since 1 January 2001.

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	6 month technical repeat rate (1.1.2002 – 30.6.2002)		Cumulative technical repeat rate (1.1.2001 – 30.6.2002)	
	Fixed	Mobile	Fixed	Mobile
BSAN	1.2%	0.1%	1.0%	0.3%
BSM	0.5%	0.6%	0.9%	0.6%
BSCtoC	0.9%	2.0%	0.9%	1.7%
BSC	1.5%	0.1%	1.7%	0.3%
BSS	1.1%	0.6%	1.2%	0.4%
BSHC	1.8%	0.1%	1.5%	0.2%
Total	1.1%	0.5%	1.1%	0.6%

All lead providers met this performance indicator for both six-month and cumulative results. These results seem inconsistent with the technical recall rates shown in Table 2.2. For instance, BreastScreen Central had a recall rate of 5.9 per 100 women screened on the mobile unit but only 0.1 per 100 films were repeated. If most women have 4 films taken initially, and 5.9 in every 100 women are recalled for technical reasons, assuming at least one extra film was taken for each woman recalled, we could expect approximately 5.9 technical repeats per 400 films, (or 1.5 per 100 films). The reported technical repeat rate is less than a tenth of this, which suggests that there may be problems with the definitions used for technical repeats. This issue was raised in Monitoring Report 11:

“It is difficult to interpret these results with respect to technical repeats and rejected films, however, as different definitions of “rejected films” are used. Some screening units do not reject films, even films regarded as technically sub-optimal that require extra films to be taken, in case the sub-optimal film may provide information for the reading radiologists. Thus, there may be a mismatch between the number of women recalled for technical reasons and the number of films rejected, and between the number of women recalled and the technical repeat rate.”

Consistency in the definition of technical recall and technical repeats between lead providers is necessary. Of particular importance is the method by which films are rejected and how this process is recorded in the National Monitoring Data Set. If the technical recall and technical repeat rates are to provide useful information for lead providers, these issues will need to be addressed. It is recommended that the NSU and lead provider data managers investigate the definitions used for technical repeats and technical recalls, ensuring consistency between lead providers in their application (Recommendation 3).

2.4 Assessment rate

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

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

The rates of referral to assessment are shown in Table 2.4 below by prevalence (those women attending for their first screen within BreastScreen Aotearoa) and incidence screens (women attending for subsequence screens within BreastScreen Aotearoa).

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

Lead provider	Six-month assessment rate (1.1.2002 – 30.6.2002)				Cumulative assessment rate (1.1.2001 – 30.6.2002)			
	Prevalence		Incidence		Prevalence		Incidence	
BSAN	376	8.9%	497	4.6%	1,342	8.9%	1,248	4.6%
BSM	116	6.5%	170	3.1%	459	6.5%	429	3.0%
BSCtoC	132	7.3%	158	3.3%	418	6.8%	424	3.2%
BSC	154	9.6%	140	3.7%	515	9.7%	388	3.7%
BSS	257	8.7%	329	3.8%	1,030	9.3%	902	4.3%
BSHC	39	5.8%	65	1.8%	225	9.3%	211	2.1%
Total	1,074	8.2%	1,359	3.6%	3,989	8.5%	3,602	3.8%

The referral rates with 95% confidence intervals for BreastScreen Aotearoa for this six-month period were:

Prevalence screens 8.2 (7.7 – 8.7)

Incidence screens 3.6 (3.4 – 3.8)

If the population of screened women were a random sample from an infinite population, then there would be a 95% chance of the referral to assessment parameter falling within the confidence interval.

All lead providers met the performance indicator for referral to assessment for prevalence screening and BreastScreen Midland and BreastScreen HealthCare also achieved the expected value. For incidence screening all lead providers met the performance indicator.

Cumulative prevalence screen results for the 18 months from 1 January 2001 were consistent with these six-month results, as all lead providers met the performance indicator and two lead providers, BreastScreen Midland and BreastScreen Coast to Coast also achieved the expected assessment rate. All lead providers met the performance indicator for incidence screening.

Variation in the rate of referral to assessment for incidence screening may be influenced by the availability and use of previous films, whether consensus or independent third reading of films is used when discrepancies between the two blind readings occur.

2.5 Outstanding assessment records of the national monitoring data set

The National Screening Unit advised BSAIMG that there were 68 assessment records outstanding in this six-month period. Of these 68 women, nineteen have since completed assessment and the records have been sent to NZHIS for inclusion in the national monitoring data set. Of the remaining records, seventeen records remain incomplete, one record was undergoing NHI maintenance, eighteen women are on extended assessment, eight have exited the programme, and four women have chosen to go to private providers. One woman did not require assessment and was returned to routine re-screening.

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 value is < 6%
-incidence round: indicator is < 4% and the expected value is < 3%

The false positive rate measures the proportion of women who are recalled to assessment, but after assessment are found not to have cancer. False positive rates are shown in Table 2.6.

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

Lead provider	Six-month false positive rate (1.1.2002 – 30.6.2002)		Cumulative false positive rate (1.1.2001 – 30.6.2002)	
	Prevalence	Incidence	Prevalence	Incidence
BSAN	7.3%	3.8%	7.6%	3.9%
BSM	5.9%	2.4%	5.7%	2.4%
BSCtoC	5.4%	2.6%	5.7%	2.6%
BSC	9.2%	3.2%	8.9%	3.0%
BSS	7.9%	3.2%	8.6%	3.7%
BSHC	5.2%	1.3%	8.5%	1.7%
Total	7.1%	3.0%	7.5%	3.2%

The false positive rates with 95% confidence intervals for BreastScreen Aotearoa for this six-month period were:

Prevalence screens 7.1% (6.7 – 7.5)

Incidence screens 3.0% (2.8 – 3.2)

If the population of screened women were a random sample from an infinite population, then there would be a 95% chance of the false positive parameter falling within the confidence interval.

During this six-month period, all except one lead provider (BreastScreen Central) met the performance indicator for prevalence screening. This may be related to small numbers however, and the cumulative false positive rate for prevalence screening for this lead provider was less than 9%. All lead providers met the performance indicator for incidence screening.

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	Six-month open surgical biopsy rate per 100 women screened		Cumulative open surgical biopsy rate per 100 women screened	
BSAN	24	0.2%	113	0.3%
BSM	9	0.1%	34	0.2%
BSCtoC	7	0.1%	27	0.1%
BSC	19	0.4%	55	0.3%
BSS	13	0.1%	43	0.1%
BSHC	6	0.1%	27	0.2%
Total	78	0.2%	299	0.2%

Note – an unknown number of open surgical biopsies are not recorded in the National Monitoring Data Set.

All lead providers met this target.

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 < 20g.

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

Table 2.8. Number and per cent of benign open biopsies, which weigh <20g by lead provider.

Lead Provider	Six-month per cent of benign biopsies weighing less than 20g		Cumulative per cent of benign biopsies weighing less than 20g	
BSAN	12	66.7%	48	53.9%
BSM	3	42.9%	12	52.2%
BSCtoC	*	*	*	*
BSC	13	92.9%	26	78.8%
BSS	10	83.3%	22	57.9%
BSHC	2	66.7%	14	87.5%
Total	40	74.1%	122	61.3%

* 80% of the benign open biopsies had a default weight recorded within the national monitoring data set so results for BreastScreen Coast to Coast have not been reported.

** An unknown number of open surgical biopsies are not recorded in the National Monitoring Data Set.

BreastScreen Central and BreastScreen South met the target in the six-month reporting period while BreastScreen HealthCare met the target for the cumulative per cent for the 1.01.2001 – 30.6.2002 time period.

It was recommended in Monitoring Report no. 9 that this indicator no longer be reported but we await the conclusions of the review of the Interim National Quality Standards.

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 this six-month period and the cumulative total for Round 2 is shown in Tables 2.9a and 2.9b.

Table 2.9a. Numbers of women undergoing needle biopsy (n) and rate of needle biopsy per 100 women screened by lead provider for the period 1.1.2002 – 30.6.2002.

Lead Provider	Six-month totals (1.1.2002 – 30.6.2002)									
	FNA only		Core needle only		Both*		Other		Total	
BSAN	29	0.2	144	1.0	22	0.1	22	0.1	217	1.4
BSM	10	0.1	85	1.2	5	0.1	0	0	100	1.4
BSCtoC	13	0.2	93	1.4	1	0	0	0	107	1.6
BSC	8	0.1	91	1.7	0	0	0	0	99	1.9
BSS	76	0.7	137	1.2	5	0	0	0	218	1.9
BSHC	9	0.2	16	0.4	6	0.1	0	0	31	0.7
Total	145	0.3	566	1.1	39	0.1	22	0	772	1.5

* Women who have both FNA and core needle procedures.

** The above table is derived from data, which is inconsistent with the data used in the production of Table 5.4. Some women, for whom no biopsy type is recorded, have a date of notification of a biopsy result recorded. This data inconsistency may represent an unknown number of needle biopsies not being recorded in the National Monitoring Data Set.

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

Lead Provider	Cumulative totals (1.1.2001 – 30.6.2002)									
	FNA only		Core needle only		Both*		Other		Total	
BSAN	67	0.2	477	1.1	61	0.1	63	0.1	668	1.6
BSM	34	0.2	247	1.2	10	0	4	0	295	1.4
BSCtoC	26	0.1	252	1.3	1	0	0	0	279	1.4
BSC	21	0.1	245	1.5	19	0.1	0	0	285	1.8
BSS	238	0.7	473	1.5	31	0.1	0	0	742	2.3
BSHC	35	0.3	64	0.5	8	0.1	0	0	107	0.9
TOTAL	421	0.3	1,758	1.2	130	0.1	67	0	2,376	1.7

* Women who have both FNA and core needle procedures.

** The above table is derived from data, which is inconsistent with the data used in the production of Table 5.4. Some women, for whom no biopsy type is recorded, have a date of notification of a biopsy result recorded. This data inconsistency may represent an unknown number of needle biopsies not being recorded in the National Monitoring Data Set.

The number of women who had needle and open biopsy procedures as a percentage of the number of women referred to assessment for this six-month period and cumulatively is shown in Table 2.9c. It should be noted that the totals in Table 2.9c differ from the totals in Tables 2.9a and 2.9b, because this table includes all biopsy procedures (needle and open biopsies).

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			
	Six-month total (1.1.2002 – 30.6.2002)		Cumulative total (1.1.2001 – 30.6.2002)	
	Number	Percentage	Number	Percentage
BSAN	231	26.5%	722	27.9%
BSM	102	35.7%	299	33.7%
BSCtoC	110	37.9%	291	34.6%
BSC	99	33.7%	290	32.1%
BSS	221	37.7%	746	38.7%
BSHC	33	31.7%	116	26.6%
Total	796	32.7%	2,464	32.5%

Note: The above table is derived from data, which is inconsistent with the data used in the production of Table 5.4. Some women, for whom no biopsy type is recorded, have a date of notification of a biopsy result recorded. This data inconsistency may represent an unknown number of needle or open surgical biopsies not being recorded in the National Monitoring Data Set.

The cumulative percentage of women proceeding to biopsy (needle and/or open biopsy) following assessment continues to be highest for BreastScreen South.

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 is the proportion of women without breast cancer at screening that have a negative screen result. This is estimated by expressing the number of women who have a negative screen result as a proportion of all women screened less the number with cancer detected at the time of screening. Although false negative results are included in both the numerator and the denominator, the number of false negatives is so small in comparison to the number of true negatives that a reasonable estimate of specificity can be made. One minus the specificity is the proportion of women without breast cancer at screening who have a positive result. Positive results require further investigation to determine whether or not cancer is present. The estimated specificity for each lead provider is shown in Table 2.10.

Table 2.10. Specificity of the programme by lead provider.

Lead provider	Six-month specificity 1.1.2002 – 30.6.2002		Specificity during Round 2 1.1.2001 – 30.6.2002	
	Prevalence	Incidence	Prevalence	Incidence
BSAN	92.6%	96.2%	92.3%	96.0%
BSM	94.1%	97.5%	94.2%	97.5%
BSCtoC	94.5%	97.4%	94.2%	97.3%
BSC	90.8%	96.8%	91.0%	97.0%
BSS	92.0%	96.8%	91.4%	96.2%
BSHC	94.8%	98.7%	91.4%	98.3%
Total	92.8%	97.0%	92.4%	96.8%

In Monitoring Report no. 9 it was recommended that the performance indicator for specificity in incidence screening be set at greater than 96%. This is consistent with the incidence screening performance indicator for the false positive rate. In this six-month period all lead providers achieved specificities of greater than 96% for incident screening.

Specificity for prevalence screening tends to be lower, partly because radiologists do not have access to earlier mammograms for comparison, and this is seen in the results for this six-month reporting period. BreastScreen Auckland and North, BreastScreen Central and BreastScreen South did not meet the indicator for prevalence screening in this reporting period (although all three were close to meeting the indicator of greater than 93%).

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 ≥ 6 per 1000 women screened
 - incidence round: indicator is ≥ 3 per 1000 women screened

The number of women 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	Six-month cancer detection rate (1.1.2002 – 30.6.2002)				Cumulative cancer detection rate (1.1.2001 – 30.6.2002)			
	Prevalence		Incidence		Prevalence		Incidence	
	No.	Rate per 1000	No.	Rate per 1000	No.	Rate per 1000	No.	Rate per 1000
BSAN	50	11.8	59	5.4	169	11.2	154	5.7
BSM	9	5.1	32	5.8	46	6.5	74	5.2
BSCtoC	29	16.1	29	6.0	58	9.4	66	5.0
BSC	7	4.4	19	5.0	39	7.4	72	6.8
BSS	19	6.4	45	5.2	66	5.9	117	5.6
BSHC	3	4.4	17	4.6	16	6.6	40	4.0
Total	117	9.0	201	5.4	394	8.4	523	5.5

The detection rates with 95% confidence intervals for BreastScreen Aotearoa for this six-month period were:

Prevalence 9.0 per 1,000 women screened (8.5 – 9.5)

Incidence 5.4 per 1,000 women screened (5.2 – 5.6)

If the population of screened women were a random sample from an infinite population, then there would be a 95% chance of the cancer detection parameter falling within the confidence interval.

All lead providers met the performance indicator for incidence screening, both in this six-month reporting period, and in the eighteen months from 1 January 2001. Some lead providers did not meet the performance indicator for prevalence screening during this six-month reporting period (BreastScreen Midland, BreastScreen Central, and BreastScreen HealthCare), but the relatively low frequency with which DCIS and breast cancer are diagnosed over a six-month period may, by chance, result in a cancer detection rate below the performance indicator.

The six-month 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 of DCIS and invasive cancer rate for prevalence screening by lead provider for the period 1.1.02 – 30.6.02.

Lead provider	Referral to assessment per 100 women screened	Specificity	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	8.9%	92.6%	7.3%	11.8
BSM	6.5%	94.1%	5.9%	5.1
BSCtoC	7.3%	94.5%	5.4%	16.1
BSC	9.6%	90.8%	9.2%	4.4
BSS	8.7%	92.0%	7.9%	6.4
BSHC	5.8%	94.8%	5.2%	4.4
Total	8.2%	92.8%	7.1%	9.0

For prevalence screening in this six-month reporting period, the false positive rate for BreastScreen Central was higher than expected, and the specificity was lower than expected. Specificity was also lower than expected for this lead provider during the 18 months from 1 January 2001 (Table 3.1.1c). These characteristics of service performance should be reviewed by BreastScreen Central.

Table 3.1.1b. Referral to assessment, specificity, false positive rate and detection rate of DCIS and invasive breast cancer for incidence screening by lead provider for the period 1.1.02 – 30.6.02.

Lead provider	Referral to assessment per 100 women screened	Specificity (%)	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	4.6%	96.2%	3.8%	5.4
BSM	3.1%	97.5%	2.4%	5.8
BSCtoC	3.3%	97.4%	2.6%	6.0
BSC	3.7%	96.8%	3.2%	5.0
BSS	3.8%	96.8%	3.2%	5.2
BSHC	1.8%	98.7%	1.3%	4.6
Total	3.6%	97.0%	3.0%	5.4

During the six-month reporting period, all lead providers met the performance indicators for referral to assessment, false positive rates, specificity, and breast cancer detection, for incidence screening.

Table 3.1.1c. Referral to assessment, specificity, false positive rate and detection rate of DCIS and invasive cancer for prevalence screening by lead provider for the period 1.1.01 – 30.6.02.

Lead provider	Referral to assessment per 100 women screened	Specificity	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	8.9%	92.3%	7.6%	11.2
BSM	6.5%	94.2%	5.7%	6.5
BSCtoC	6.8%	94.2%	5.7%	9.4
BSC	9.7%	91.0%	8.9%	7.4
BSS	9.3%	91.4%	8.6%	5.9
BSHC	9.3%	91.4%	8.5%	6.6
Total	8.5%	92.4%	7.5%	8.4

Table 3.1.1d. Referral to assessment, specificity, false positive rate and detection rate of DCIS and invasive breast cancer for incidence screening by lead provider for the period 1.1.01 – 30.6.02.

Lead provider	Referral to assessment per 100 women screened	Specificity	False positive rate per 100 women screened	Detection rate per 1000 women screened
BSAN	4.6%	96.0%	3.9%	5.7
BSM	3.0%	97.5%	2.4%	5.2
BSCtoC	3.2%	97.3%	2.6%	5.0
BSC	3.7%	97.0%	3.0%	6.8
BSS	4.3%	96.2%	3.7%	5.6
BSHC	2.1%	98.3%	1.7%	4.0
Total	3.8%	96.8%	3.2%	5.5

During the eighteen months from 1 January 2001, all lead providers met the performance indicators for referral to assessment, false positive rates, specificity, and breast cancer detection, for incidence screening.

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 six-month monitoring period have been provided for women screened up to the end of September 2001 (three months prior to the start of this reporting period).

All lead providers achieved 90% completion of cancer detail records from the commencement of screening to the end of September 2001.

Table 3.2.1 shows the available data for each lead provider.

Table 3.2.1 Availability of treatment data.

Lead provider	BSAN	BSM	BSC to C	BSC	BSS	BSHC	TOTAL
DCIS and invasive breast cancer detected	519	217	189	174	346	114	1,559
Less:							
Data entered - not sent to NMDS	1	0	2	2	1	0	6
Data collected – not entered	0	0	0	0	0	2	2
Waiting for treatment data	0	0	3	5	9	3	20
NHI merge	0	0	0	2	0	2	4
Unable to obtain data from treatment provider	0	2	0	0	0	0	2
Women who did not consent to data collection	2	0	0	3	15	0	20
Women who did no consent to treatment	3	0	0	2	0	0	5
Woman to attend treatment overseas	0	0	0	0	1	0	1
Women with a final diagnosis of cancer, but for who no further details beyond assessment are available (%)	6 (1.2)	2 (1.0)	5 (2.6)	14 (8.0)	26 (7.5)	7 (6.1)	60 (3.8)
Total number of available records	513	215	184	160	320	107	1,499

Of the 1,559 women recorded with a diagnosis of DCIS or cancer from the commencement of BreastScreen Aotearoa to the 30 September 2001, there were 60 women with a final diagnosis of cancer, but for whom no further details beyond assessment were available.

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.

This report provides information on the primary tumour classification (pT classification) and nodal status of tumours detected in BreastScreen Aotearoa. The UICC TNM staging of tumours detected in BreastScreen Aotearoa is also reported in this BSAIMG monitoring report (Table 3.3.5).

Details of the cancers recorded in the national monitoring data set are summarised below. The 1997 UICC pT system for classifying primary tumours is:

TX	Primary tumour cannot be assessed
T0	No evidence of primary tumour
Tis	Carcinoma in situ: intraductal carcinoma, lobular carcinoma in situ or Paget's 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 classification of pT4 tumours exist within the UICC pT system. These are listed below but it is not necessary to record these subcategories in the national monitoring data set because pT4 tumours are rarely detected at screening.

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 pT1a, pT1b, pT1c, pT2, pT3 and pT4. PTis (DCIS) is not invasive breast cancer.

The pT classification of the primary tumour for DCIS and cancers detected for which information was available is shown in Table 3.2.2.

Table 3.2.2 Numbers of women and percentage of reported primary tumours and their classifications by lead provider for the period 1.12.98 – 30.9.01.

Primary tumour (pT) classification	BSAN	BSM	BSC to C	BSC	BSS	BSHC	Total (%)
<i>DCIS (per cent of all tumours)</i>							
pTis (DCIS)	138 (26.9)	39 (18.1)	30 (16.3)	22 (13.8)	63 (19.7)	19 (17.8)	311 (20.7)
<i>Invasive cancers (per cent of invasive cancers)</i>							
pTX*	3 (0.8)	0	0	0	0	0	3 (0.3)
pT0	0	9 (5.1)	0	0	0	0	9 (0.8)
pT1a	49 (13.1)	14 (8.0)	20 (13.0)	13 (9.4)	34 (13.2)	10 (11.4)	140 (11.8)
pT1b	107 (28.5)	40 (22.7)	37 (24.0)	45 (32.6)	65 (25.3)	33 (37.5)	327 (27.5)
pT1c	137 (36.5)	82 (46.6)	61 (39.6)	65 (47.1)	117 (45.5)	32 (36.4)	494 (41.6)
pT2	66 (17.6)	30 (17.0)	34 (22.1)	15 (10.9)	39 (15.2)	11 (12.5)	195 (16.4)
pT3	6 (1.6)	1 (0.6)	1 (0.6)	0	1 (0.4)	2 (2.3)	11 (0.9)
pT4	7 (1.9)	0	1 (0.6)	0	1 (0.4)	0	9 (0.8)
Total invasive	375 (31.6)	176 (14.8)	154 (13.0)	138 (11.6)	257 (21.6)	88 (7.4)	1,188 (100)
<i>Total DCIS and invasive</i>							
DCIS and invasive	513	215	184	160	320	107	1,499

* Primary tumour cannot be assessed.

There were 1,559 women diagnosed with invasive breast cancer and DCIS in BreastScreen Aotearoa between December 1998 and 30 September 2001. Of these 1,559 women, 1,499 had pT classifications recorded in the national monitoring data set (Table 3.2.1). Of these 1,499 women, 311 were diagnosed with DCIS and 1,188 were diagnosed with invasive breast cancer.

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 3.3.1.

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

Indicator ≥4.8 per 1000 women screened

The invasive cancer detection rate per 1000 women screened is shown in Table 3.3.1.

Table 3.3.1 Invasive cancer detection rate by lead provider per 1000 women screened for the period 1.12.98 – 30.9.01.

Lead Provider	Cumulative invasive cancer detection rate per 1000 women	
	Number with invasive cancer detected	Rate per 1000 women screened
BSAN	375	7.3
BSM	176	5.7
BSCtoC	154	6.4
BSC	138	7.7
BSS	257	6.2
BSHC	88	5.2
Total	1,188	6.5

* Includes pTX (primary tumour cannot be assessed).

All lead providers met the performance indicator for invasive cancer detection. As expected, BreastScreen Midland and BreastScreen HealthCare (which incorporated the two pilot screening areas) had lower invasive cancer detection rates because they were performing mainly incidence screening during this period.

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 ipsilateral internal mammary

Table 3.3.2 Nodal status of women with invasive breast cancer by lead provider for the period 1.12.98 – 30.09.01.

Lead provider	Classification								
	pNX		pN0		pN1		pN2		Total
BSAN	12	3.2%	270	72.0%	93	24.8%	0	0	375
BSM	13	7.4%	124	70.5%	39	22.2%	0	0	176
BSCtoC	2	1.3%	108	70.1%	41	26.6%	3	1.9%	154
BSC	2	1.4%	105	76.0%	31	22.5%	0	0	138
BSS	5	1.9%	191	74.3%	58	22.6%	3	1.2%	257
BSHC	2	2.3%	69	78.4%	17	19.3%	0	0	88
Total	36	3.0%	867	73%	279	23.5%	6	0.5%	1,188

* Includes pTX (primary tumour cannot be assessed).

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 for the period 1.12.98 – 30.9.01.

Lead provider	Classification						
	pMX		pM0		pM1		Total
BSAN	312	83.2%	58	15.5%	5	1.3%	375
BSM	58	33.0%	117	66.5%	1	0.6%	176
BSCtoC	0	0	153	99.4%	1	0.6%	154
BSC	134	97.1%	4	2.9%	0	0	138
BSS	1	0.4%	256	99.6%	0	0	257
BSHC	0	0	88	100%	0	0	88
Total	505	42.5%	676	56.9%	7	0.6%	1,188

* Includes pTX (primary tumour cannot be assessed).

Of the 1,188 women with invasive breast cancer detected, seven had metastatic disease. It is clear from Table 3.3.3, that lead providers differ in their process for staging, with some using MX where others would use M0. It is important that lead providers standardise the reporting of nodal and metastatic status (Recommendation 6).

The histological grade of the breast cancer detected is shown in Table 3.3.4 for women for whom pT classification was available. 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 – 30.9.01.

Lead Provider	Classification										
	Grade 0*		Grade 1		Grade 2		Grade 3		No grading		Total
BSAN	10	2.7%	106	28.3%	209	55.7%	49	13.1%	6	1.0%	375
BSM	10	5.7%	69	39.2%	78	44.3%	19	10.8%	0	0	176
BSCtoC	16	10.4%	57	37.0%	57	37%	24	15.6%	0	0	154
BSC	16	11.6%	56	40.6%	51	37%	15	10.9%	0	0	138
BSS	22	8.6%	123	47.9%	77	30.0%	35	13.6%	0	0	257
BSHC	9	10.2%	39	44.3%	31	35.2%	9	10.2%	0	0	88
Total	83	7.0%	450	37.9%	503	42.3%	151	12.7%	6	4.0%	1,188

* No pathological grade given.

** Includes pTX (primary tumour can not be assessed).

“No grading” is a valid value within the national monitoring data set. The European Guidelines recommend that all histological subtypes of cancers be graded. This requires adherence to a recommended protocol².

Overall, 45% of invasive cancers detected were tumours of grade 0 or 1.

The UICC TNM stage of breast cancers detected in BreastScreen Aotearoa is shown in Table 3.3.5. Fifty-two percent of the tumours were classified as Stage 1.

Table 3.3.5 UICC Stage by lead provider 1 December 1998 to 30 September 2001*.

Lead provider	Stage 0**		Stage I		Stage IIA		Stage IIB		Stage IIIA		Stage IIIB		Stage IV	
BSAN	138	27.5%	233	46.4%	83	16.5%	32	6.4%	6	1.2%	5	1.0%	5	1.0%
BSM	39	19.3%	108	53.5%	40	19.8%	13	6.4%	1	0.5%	0	0.0%	1	0.5%
BSCtoC	30	16.6%	89	49.2%	45	24.9%	13	7.2%	2	1.1%	1	0.6%	1	0.6%
BSC	22	13.9%	97	61.4%	32	20.3%	7	4.4%	0	0.0%	0	0.0%	0	0.0%
BSS	63	20.0%	173	54.9%	54	17.1%	22	7.0%	2	0.6%	1	0.3%	0	0.0%
BSHC	19	18.3%	60	57.7%	19	18.3%	5	4.8%	1	1.0%	0	0.0%	0	0.0%
TOTAL	311	21.3%	760	52.0%	273	18.7%	92	6.3%	12	0.8%	7	0.5%	7	0.5%

* This table reports UICC stage for 1,462 tumours (37 tumours were excluded from the total of 1,499 breast cancers detected, because insufficient data was available for staging).

** Stage 0 = DCIS.

Figure 2 Stage distribution of breast cancer diagnosed in BreastScreen Aotearoa 1999-2001, compared with the stage distribution of breast cancer diagnosed in New Zealand women aged 50-64 during 1979-1988 (before the establishment of screening)

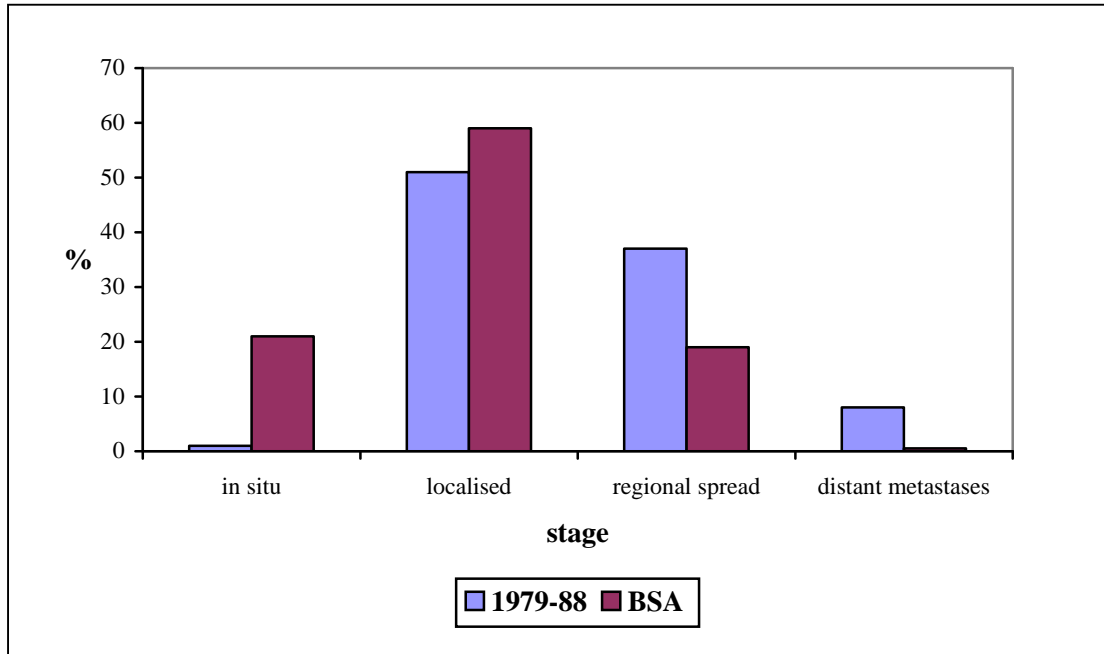


Figure 2 shows the level of spread for breast cancers detected in BreastScreen Aotearoa compared with breast cancers diagnosed in women aged 50-64 years during the 1979-88 time period. The favourable shift in the level of spread seen in Figure 2 is mainly due to the increased detection of DCIS in the screening programme.

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. Number and percentage of women with invasive breast cancer who did not have nodal involvement for the period 1.12.98 – 30.9.01.

Lead Provider	Cumulative number and percentage with no nodal involvement (number with invasive cancer detected)	
BSAN	270	74.4%
BSM	124	76.1%
BSCtoC	108	71.1%
BSC	105	77.2%
BSS	191	75.8%
BSHC	69	80.2%
TOTAL	867	75.3%

* Cancers classified as pNX (regional lymph nodes not assessed) have not been included.

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

Figure 3 *Nodal status of invasive breast cancers detected at first screening in BreastScreen Aotearoa compared with first screening in the Swedish Two-County trial.*

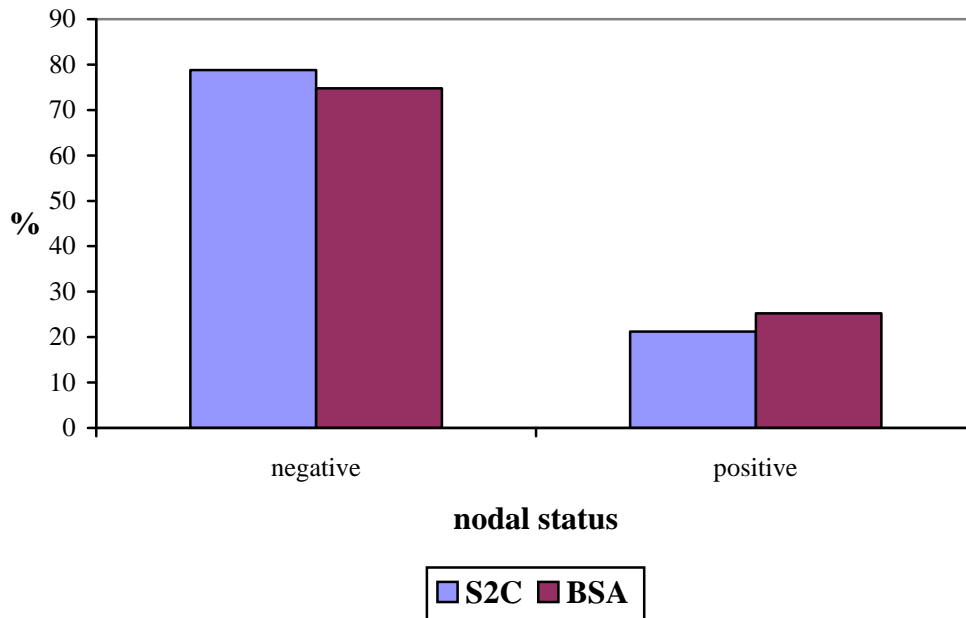


Figure 3 shows the proportion of invasive breast cancers detected with positive and negative lymph nodes in BreastScreen Aotearoa compared with the Swedish Two-County trial. Similar results were obtained, though a slightly higher proportion of cancers were node positive in BreastScreen Aotearoa.

3.5 Ductal carcinoma in situ

Definition – number of women with DCIS as a percentage of the number of women diagnosed with 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 – 30.9.2001.

Lead Provider	Number and percentage of cancers that were ductal carcinoma in situ only	
BSAN	138	26.9%
BSM	39	18.1%
BSCtoC	30	16.3%
BSC	22	13.8%
BSS	63	19.7%
BSHC	19	17.8%
TOTAL	311	20.7%

Five lead providers met this performance indicator of 10 - 25% of cancers detected being DCIS. This is an encouraging result for BreastScreen Aotearoa. For BreastScreen Auckland and North 26.9% of cancers detected were DCIS. In the latest European Guidelines² the performance indicator is that 10 - 20% of cancers detected should be DCIS and results outside of this range may indicate a difference in pathological reporting.

4. Summary of treatment

The National Screening Unit is developing treatment indicators. Achieving them will be important to minimise mortality from breast cancer, improve the quality of life of patients, minimise anxiety, minimise complications, minimise recurrences and maximise the likelihood of a good cosmetic result after surgery.

Of the 1,559 women with breast cancer and DCIS detected to 30 September 2001, 1,499 had the pT classification of their cancer and DCIS recorded. Of these women, 1,473 had the last surgical treatment procedure recorded within the national monitoring data set, (includes three women for whom surgical treatment was not recommended and one woman who declined treatment). Twenty-six women did not have their last surgical treatment recorded.

4.1 Surgery

The number of women receiving different last surgical treatment procedures, on the breast containing the primary tumour, is shown in Table 4.1.1.

The treatment options available will be influenced by the stage of cancer detected, and also by each woman's choice. The number of women receiving mastectomy by pT classification is shown in Table 4.1.2. The proportion of women in BreastScreen Coast to Coast is particularly high. This reasons for this need to be determined.

Table 4.1.1 Number of women receiving last surgical treatment procedures on the breast containing the primary tumour by lead provider for the period 1.12.98 – 30.9.01.

Lead provider	Type	None recommended	None – patient declined	Excision Biopsy n (%)	Wide local excision n (%)	Sector Resection n (%)	Mastectomy n (%)	Other n (%)	Not stated (Blank)	Total n (%)
BSAN	Invasive	0 (0)	0 (0)	0 (0)	68 (18.1)	148 (39.5)	148 (39.5)	4 (1.1)	7 (1.9)	375 (100)
	DCIS	0 (0)	0 (0)	3 (2.2)	60 (43.5)	25 (18.1)	38 (27.5)	0 (0)	12 (8.7)	138 (100)
	Total	0 (0)	0 (0)	3 (0.6)	128 (25.0)	173 (33.7)	186 (36.3)	4 (0.8)	19 (3.7)	513 (100)
BSM	Invasive	3 (1.7)	1 (1)	7 (4.0)	97 (55.1)	14 (8.0)	54 (30.7)	0 (0)	0 (0)	175 (100)*
	DCIS	0 (0)	0 (0)	1 (2.6)	21 (53.8)	3 (7.7)	12 (30.8)	2 (5.1)	0 (0)	39 (100)
	Total	3 (1.4)	1 (0.5)	8 (3.7)	118 (54.9)	17 (7.9)	66 (30.7)	2 (0.9)	0 (0)	214 (100)*
BSCtoC	Invasive	0 (0)	0 (0)	2 (1.3)	54 (35.1)	1 (0.6)	95 (61.7)	1 (0.6)	1 (0.6)	154 (100)
	DCIS	0 (0)	0 (0)	3 (10.0)	12 (40.0)	1 (3.3)	11 (36.7)	0 (0)	3 (10.0)	30 (100)
	Total	0 (0)	0 (0)	5 (2.7)	66 (35.9)	2 (1.1)	106 (57.6)	1 (0.5)	4 (2.2)	184 (100)
BSC	Invasive	0 (0)	0 (0)	3 (2.2)	80 (58.0)	2 (1.4)	51 (37.0)	1 (0.7)	1 (0.7)	138 (100)
	DCIS	0 (0)	0 (0)	2 (9.1)	9 (40.9)	0 (0)	11 (50.0)	0 (0)	0 (0)	22 (100)
	Total	0 (0)	0 (0)	5 (3.1)	89 (55.6)	2 (1.3)	62 (38.8)	1 (0.6)	1 (0.6)	160 (100)
BSS	Invasive	0 (0)	0 (0)	13 (5.1)	117 (45.5)	9 (3.5)	116 (45.1)	1 (0.4)	1 (0.4)	257 (100)
	DCIS	0 (0)	0 (0)	16 (25.4)	20 (31.7)	2 (3.2)	25 (39.7)	0 (0)	0 (0)	63 (100)
	Total	0 (0)	0 (0)	29 (9.1)	137 (42.8)	11 (3.4)	141 (44.1)	1 (0.3)	1 (0.3)	320 (100)
BSHC	Invasive	0 (0)	0 (0)	0 (0)	50 (56.8)	1 (1.1)	35 (39.8)	1 (1.1)	1 (1.1)	88 (100)
	DCIS	0 (0)	0 (0)	0 (0)	12 (63.2)	0 (0)	7 (36.8)	0 (0)	0 (0)	19 (100)
	Total	0 (0)	0 (0)	0 (0)	62 (57.9)	1 (0.9)	42 (39.3)	1 (0.9)	1 (0.9)	107 (100)
Total invasive		3 (0.3)	1 (0.1)	25 (2.1)	466 (39.2)	175 (14.7)	499 (42.0)	8 (0.7)	11 (0.9)	1,187 (100)
Total DCIS		0 (0)	0 (0)	25 (8.0)	134 (43.1)	31 (10.0)	104 (33.4)	2 (0.6)	15 (4.8)	311 (100)
Grand total		3 (0.2)	1 (0.1)	50 (3.3)	600 (40.0)	206 (13.7)	603 (40.2)	10 (0.7)	26 (1.7)	1,499 (100)

Table 4.1.2 The number and proportion of women receiving mastectomy by pT classification and lead provider for the period 1.12.98-30.9.01.

pT	BSAN		BSM		BSC to C		BSC		BSS		BSHC		Total	
pT0	0	0	3	4.5%	0	0	0	0	0	0	0	0	3	0.5%
pT1a	14	7.5%	3	4.5%	8	7.5%	7	11.3%	10	7.1%	4	9.5%	46	7.6%
pT1b	29	15.6%	10	15.2%	19	17.9%	9	14.5%	26	18.4%	14	33.3%	107	17.7%
pT1c	48	25.8%	27	40.9%	39	36.8%	24	38.7%	51	36.2%	11	26.2%	200	33.2%
pT2	48	25.8%	10	15.2%	27	25.5%	11	17.7%	27	19.1%	5	11.9%	128	21.2%
pT3	5	2.7%	1	1.5%	1	0.9%	0	0	1	0.7%	1	2.4%	9	1.5%
pT4	4	2.2%	0	0	1	0.9%	0	0	1	0.7%	0	0	6	1.0%
DCIS	38	20.4%	12	18.2%	11	10.4%	11	17.7%	25	17.7%	7	16.7%	104	17.2%
Total	186	100%	66	100%	106	100%	62	100%	141	100%	42	100%	603	100%

Depending on the lead provider, between 10% and 20% of all mastectomies were for DCIS. Overall, from the records of national monitoring data set, 33% of women with DCIS had mastectomy.

Depending on the lead provider, between 10% and 20% of all mastectomies were for DCIS. Overall, from the records of national monitoring data set, 33% of women with DCIS had mastectomy.

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 4.2.1 records the details of axillary sampling and dissection for women with invasive breast cancer.

Table 4.2.1 Axillary sampling and dissection for women with invasive breast cancer by lead provider

Lead provider	No axillary dissection		Axillary sampling		Axillary dissection level 1		Axillary dissection level 1 & 2		Axillary dissection level 1, 2 & 3		Not stated (Blank)		Total	
	n	%	n	%	n	%			n	%	n	%	n	%
BSAN	8	2.1	40	10.7	12	3.2	292	77.9	16	4.3	7	1.9	375	100
BSM	19	10.8	8	4.5	13	7.4	104	59.1	32	18.2	0	0	176	100
BSCtoC	8	5.2	9	5.8	8	5.2	119	77.3	9	5.8	1	0.6	154	100
BSC	3	2.2	2	1.4	12	8.7	118	85.5	2	1.4	1	0.7	138	100
BSS	6	2.3	23	8.9	18	7.0	202	78.6	7	2.7	1	0.4	257	100
BSHC	2	2.3	1	1.1	1	1.1	82	93.2	1	1.1	1	1.1	88	100
Total	46	3.9	129	7.0	64	5.4	917	77.2	67	5.6	11	0.9	1,188	100

Of the 311 women with DCIS, 231(74%) did not have axillary sampling or dissection performed. Since the previous monitoring report (Report 11) there have been 48 women diagnosed with DCIS. Of these women, 37 (77%) did not have axillary procedures. The reason why women with DCIS had axillary dissection performed, may be partly explained by the classification by some lead providers of DCIS with microinvasion as DCIS instead of invasive breast cancer. The desirable level in the European Guidelines for the proportion of women with DCIS where no axillary dissection was carried out is greater than 95%².

It is very important axillary dissection is avoided, where possible, in women with DCIS, because axillary dissection carries the risk of lymphoedema, which can cause significant psychological and physical distress³. Even in women with invasive cancer, where assessment of nodal status is important for staging, concern about the risk of lymphoedema associated with axillary dissection has spurred the search for alternatives such as sentinel node biopsy³.

Table 4.2.2 records the range of nodes taken by axillary procedure and the average number of nodes taken within each category by lead provider.

Table 4.2.2 The average and the range of the number of nodes taken by axillary sampling and dissection for women with invasive breast cancer, by lead provider, for the period 1.12.98 – 30.9.01.

Lead provider		Axillary sampling	Axillary dissection Level 1	Axillary dissection Level 1 & 2	Axillary dissection Level 1, 2 & 3
BSAN	Range	1-8	1-21	2-29	4-36
	Average	4.0	11.9	14.0	15.9
BSM	Range	1-12	2-18	3-34	7-31
	Average	6.0	10.2	15.4	15.5
BSC to C	Range	2-17	4-10	4-28	8-34
	Average	8.3	7.3	14.3	20.0
BSC	Range	1-3	5-28	2-24	12-30
	Average	2.0	12.4	11.5	21.0
BSS	Range	1-17	2-33	1-51	3-21
	Average	7.1	10.3	15.0	15.1
BSHC	Range	7-7	6-6	7-39	25-25
	Average	7.0	6.0	16.0	25.0

The number of nodes taken and the level of axillary procedures varied considerably between lead providers. Lead providers need to ensure that the level of axillary dissection and the number of nodes sampled is accurately recorded within the national monitoring data set. Some lead providers, as part of ongoing research trials, may use sentinel node biopsy.

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 – 30.9.2001.

Lead provider	Type	Immediate n (%)	Decision delayed n (%)	No reconstruction n (%)	Total n (%)
BSAN	Invasive	24 (6.5%)	9 (2.5%)	334 (91%)	367 (100%)
	DCIS	14 (11.3%)	2 (1.6%)	108 (87.1%)	124 (100%)
	Total	38 (7.7%)	11 (2.2%)	442 (90%)	491 (100%)
BSM	Invasive	13 (7.4%)	0	162 (92.6%)	175 (100%)
	DCIS	5 (12.8%)	0	34 (87.2%)	39 (100%)
	Total	18 (8.4%)	0	196 (91.6%)	214 (100%)
BSCtoC	Invasive	6 (3.9%)	5 (3.3%)	142 (92.8%)	153 (100%)
	DCIS	2 (7.4%)	2 (7.4%)	23 (85.2%)	27 (100%)
	Total	8 (4.4%)	7 (3.9%)	165 (91.7%)	180 (100%)
BSC	Invasive	4 (2.9%)	0	133 (97.1%)	137 (100%)
	DCIS	6 (27.3%)	0	16 (72.7%)	22 (100%)
	Total	10 (6.3%)	0	149 (93.7%)	159 (100%)
BSS	Invasive	17 (6.6%)	0 (0.3%)	239 (93.4%)	256 (100%)
	DCIS	4 (6.3%)	1 (1.6%)	58 (92.1%)	63 (100%)
	Total	21 (6.6%)	1 (0.3%)	297 (93.1%)	319 (100%)
BSHC	Invasive	3 (3.4%)	1 (1.1%)	83 (95.4%)	87 (100%)
	DCIS	2 (10.5%)	0	17 (89.5%)	19 (100%)
	Total	5 (4.7%)	1 (0.9%)	100 (94.3%)	106 (100%)
Total invasive		67 (5.7%)	15 (1.3%)	1,093 (93%)	1,175 (100%)
Total DCIS		33 (11.2%)	5 (1.7%)	256 (87.1%)	294 (100%)
Grand total		100 (6.8%)	20 (1.4%)	1,349 (91.8%)	1,469 (100%)

One hundred women (7%) chose immediate breast reconstruction and 20 (1%) women delayed their decision about breast reconstruction.

4.4 Radiotherapy

Data was available for 766 women who were screened between 1.12.1998 and 30.9.2001, diagnosed with breast cancer, and offered radiotherapy.

10 women did not accept the offer of radiotherapy.

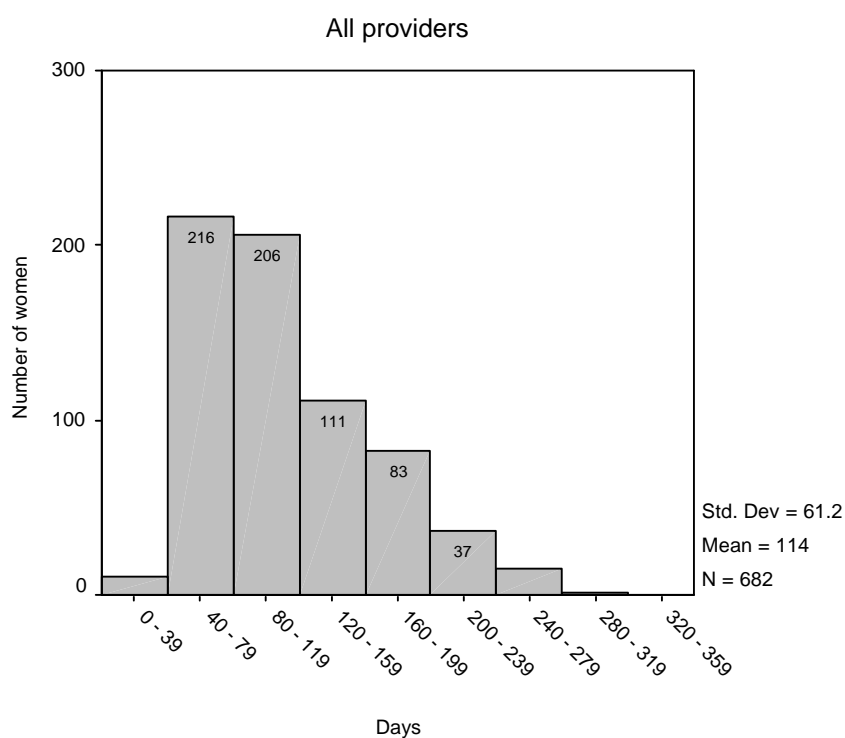
Of the majority who accepted, the most common forms of treatment were:

- 428 (57%) had breast/chest radiation only
- 238 (31%) had breast/chest radiation and a radiation boost
- 50 (7%) had breast/chest and regional nodes radiation
- 29 (5%) had breast/chest and regional nodes radiation and a radiation boost.

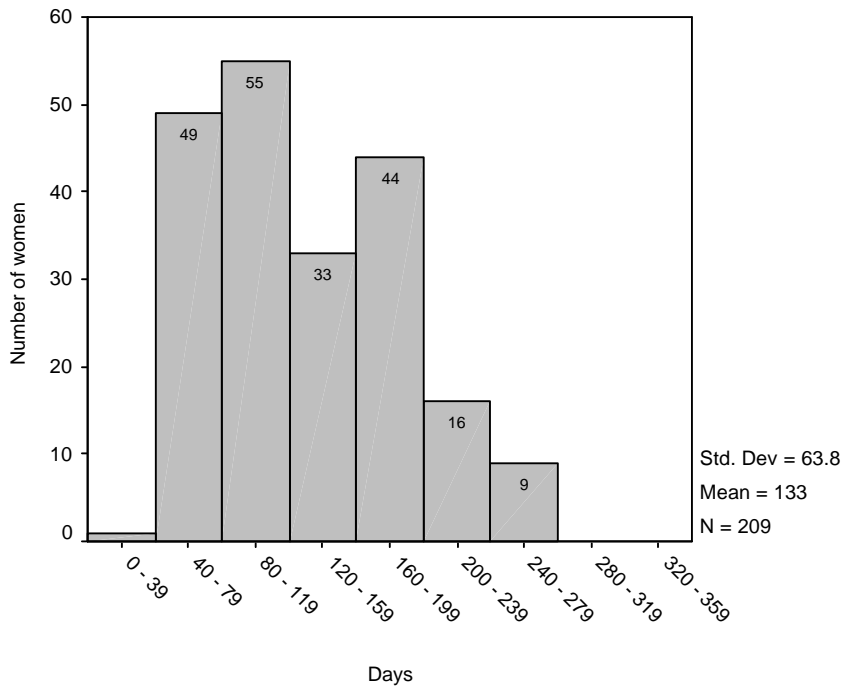
Time between diagnosis and radiotherapy was available in the data for 755 women. The charts below summarize this data by lead provider.

The charts below show the time from final diagnosis to first radiotherapy for women detected with breast cancer in the screening programme (Figure 4).

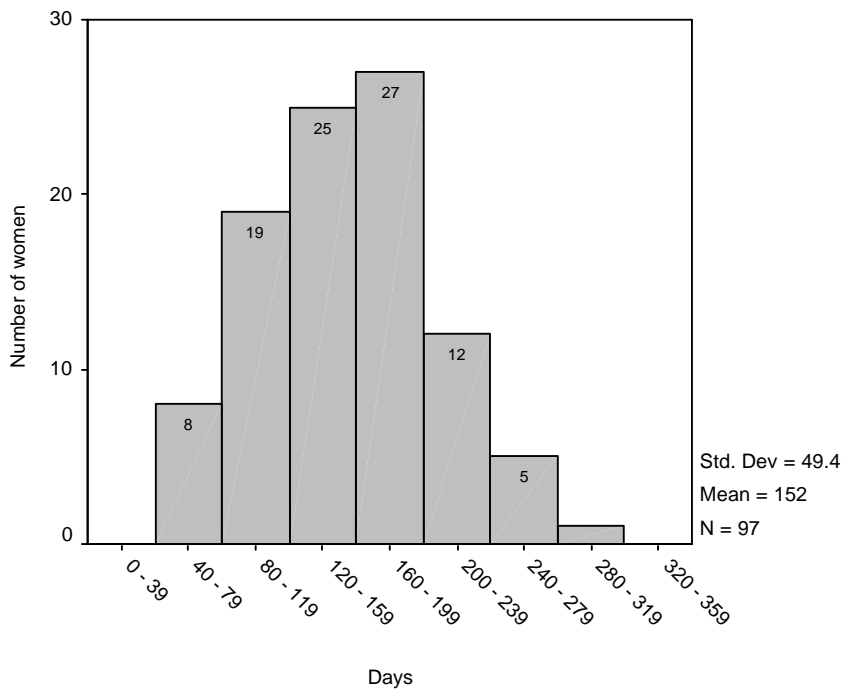
Figure 4 Time from final diagnosis to first radiotherapy for each lead provider and overall.

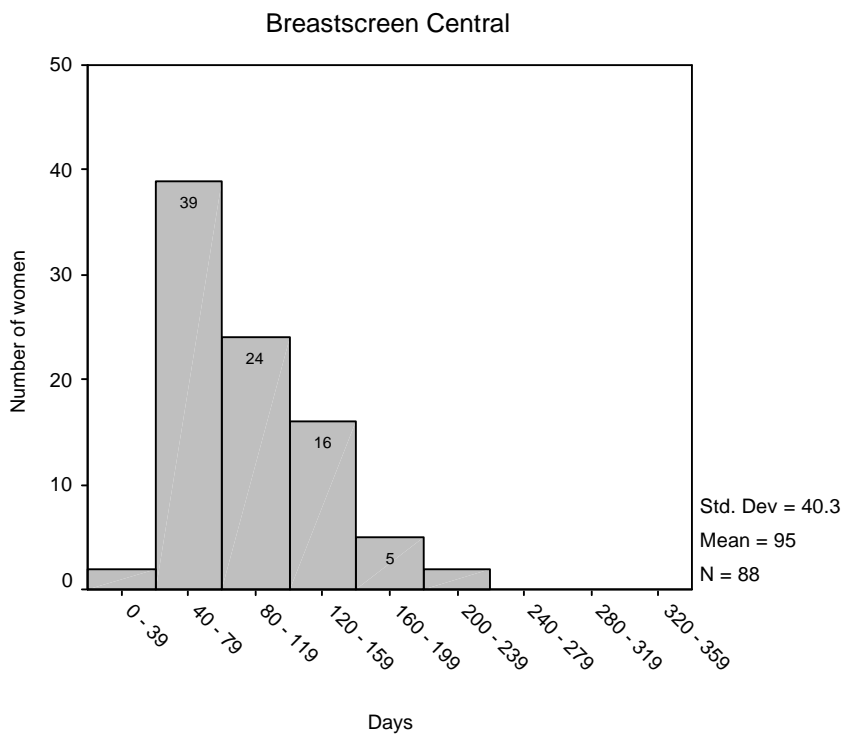
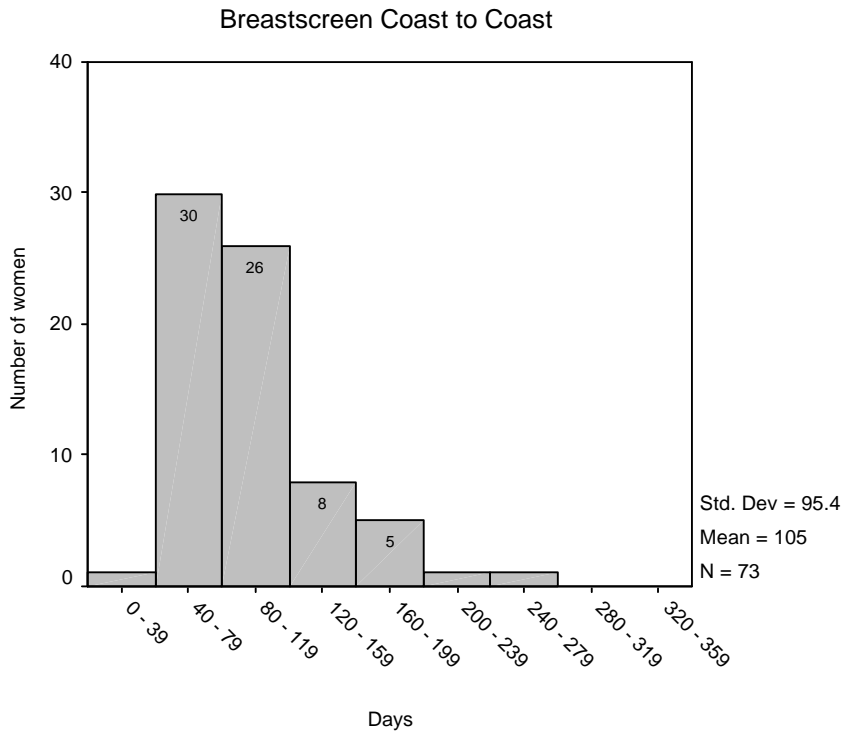


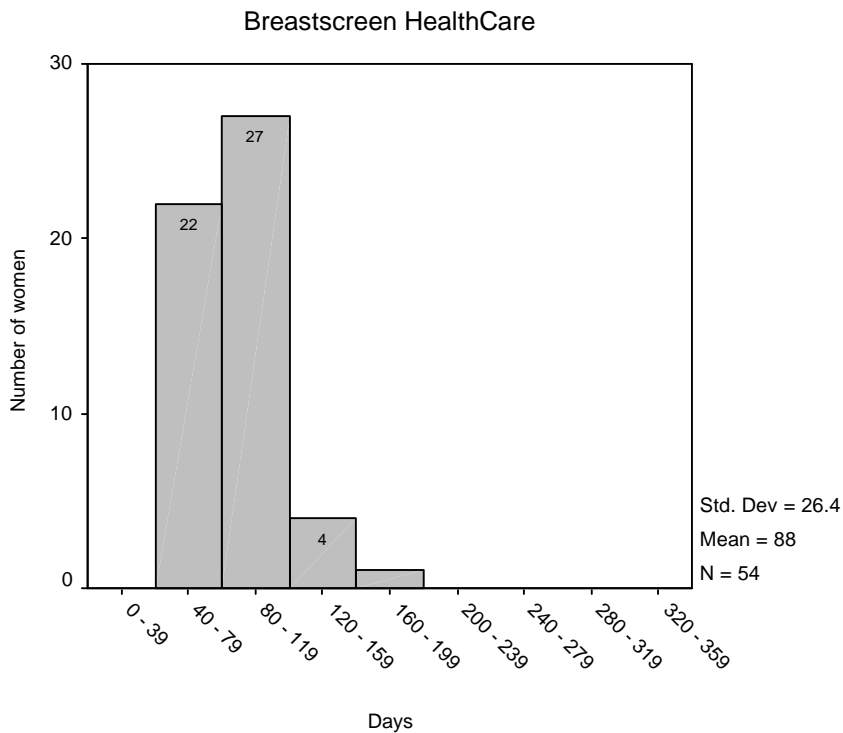
Breastscreen Auckland and North



Breastscreen Midland



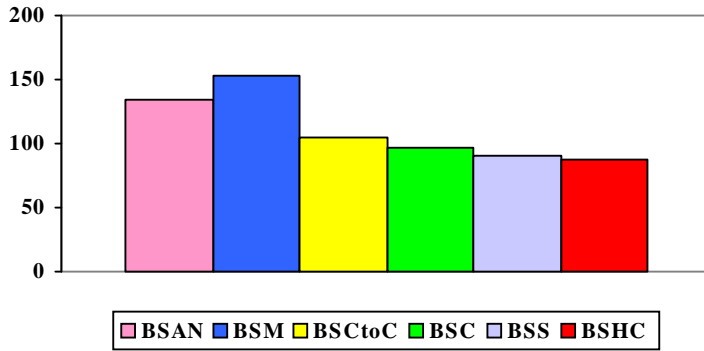




The distribution of waiting time for radiotherapy varies by lead provider. The most frequent waiting period was 40-79 days, however, for BreastScreen Midland the most frequent waiting period was 120-159 days (Figure 4).

Women diagnosed with breast cancer in the North Island have longer waits before radiotherapy than women in the lower North Island and South Island (Figure 5). The NSU should advocate for increased radiotherapy services so that women do not have to wait for treatment (Recommendation 5).

Figure 5 Mean wait for radiotherapy (days) by lead provider.



4.5 Endocrine manipulation

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

Table 4.5 Endocrine manipulation for women with invasive breast cancer by lead provider for the period 1.12.1998 – 30.9.2001.

Lead provider	SERM* n (%)	Chemical or radiation oophorectomy n (%)	Progestogen n (%)	Aromatase inhibitor n (%)	Other** n (%)	None n (%)	Unknown*** n (%)	Total n (%)
BSAN	166 (44.3)	0 (0)	0 (0)	5 (1.3)	1 (0.3)	189 (50.4)	14 (3.7)	375 (100)
BSM	107 (60.8)	0 (0)	0 (0)	2 (1.1)	6 (3.4)	32 (18.2)	29 (16.5)	176 (100)
BSCtoC	109 (70.8)	0 (0)	0 (0)	0 (0)	0 (0)	42 (27.3)	3 (1.9)	154 (100)
BSC	90 (65.2)	1 (0.7)	1 (0.7)	0 (0)	0 (0)	45 (32.6)	1 (0.7)	138 (100)
BSS	158 (61.5)	0 (0)	0 (0)	1 (0.4)	1 (0.4)	97 (37.7)	0 (0)	257 (100)
BSHC	40 (45.5)	1 (1.10)	0 (0)	0 (0)	1 (1.1)	42 (47.7)	4 (4.5)	88 (100)
Total	670 (56.4)	2 (1.1)	1 (0.1)	8 (0.7)	9 (0.8)	447 (37.6)	51 (4.3)	1,188 (100)

* Selective estrogen receptor modulator, for example, tamoxifen.

** Other – type unspecified.

*** Unknown – data not available.

Details on endocrine therapy were recorded for 1,137 of the 1,188 women who were diagnosed with invasive breast cancer at screening during the period 1.12.1998 to 30.9.2001. Almost half of these women received SERM (selective oestrogen receptor modulation) therapy. Almost half of the women did not receive any endocrine therapy. The use of SERM was lowest for women whose breast cancer was detected through BreastScreen Auckland and North and highest for those detected through BreastScreen Midland.

4.6 Chemotherapy

Information about chemotherapy was available in the database for 1,383 of the 1,559 women diagnosed with breast cancer following screens between 1.12.1998 and 30.9.2001. Of the 179 women offered chemotherapy, 137 (77%) 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	Number and per cent notified within 10 working days in the six-months (1.1.02 – 30.6.02)*		Cumulative number and per cent notified within 10 working days (1.1.01 – 30.6.02)*	
BSAN	14,412	95.2%	40,744	96.8%
BSM	7,071	97.5%	20,788	97.6%
BSCtoC	6,556	98.9%	19,184	98.5%
BSC	5,309	98.8%	15,565	98.4%
BSS	11,517	99.2%	31,600	99.1%
BSHC	4,249	97.6%	11,768	95.0%
TOTAL	49,114	97.5%	139,649	97.7%

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

As in the previous monitoring report, all lead providers met the performance target. It is encouraging that all lead providers achieved the indicator and that overall 97.5% of women screened received their results within ten working 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	Number and per cent offered assessment within 14 working days in six-months. (1.1.02 – 30.6.02)*		Cumulative number and per cent offered assessment within 14 working days (1.1.01 – 30.6.02)*	
BSAN	689	78.9%	2,124	82.0%
BSM	254	88.8%	786	88.5%
BSCtoC	236	81.4%	666	79.1%
BSC	281	95.6%	851	94.2%
BSS	559	95.4%	1,809	93.7%
BSHC	81	77.9%	304	69.7%
Total	2,100	86.3%	6,540	86.2%

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

BreastScreen Central and BreastScreen South were the only lead providers to have achieved this timeliness indicator during the period. Also, these two lead providers are the only lead providers to have thus far achieved the indicator of performance overall for Round 2. It is important that an appointment for assessment is offered as soon as possible after screening for women who require assessment (Recommendation 4).

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 seven days of their assessment.
- At least 90% of women requiring open biopsy procedure are offered that procedure within three 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 seven days of the date of first level of assessment for needle biopsy and three weeks for open surgical biopsy.

Lead Provider	Six month period (1.1.2002 – 30.6.2002)				Cumulative (1.1.01 – 30.6.02)			
	Percentage for which needle biopsy completed within seven days of assessment		Percentage for which open biopsy offered within three weeks of assessment		Percentage for which needle biopsy completed within seven days of assessment		Percentage for which open biopsy offered within three weeks of assessment	
BSAN	176	81.1%	5	20.8%	552	82.6%	41	36.3%
BSM	80	80.0%	3	33.3%	234	79.3%	10	29.4%
BSCtoC	99	92.5%	1	14.3%	262	93.9%	9	33.3%
BSC	94	94.9%	8	42.1%	271	95.1%	31	56.4%
BSS	188	86.2%	10	76.9%	624	84.1%	29	67.4%
BSHC	26	83.9%	5	83.3%	96	89.7%	22	81.5%
Total	663	85.9%	32	41.0%	2039	85.8%	142	47.5%

Note: The indicator used was stated in the Data Management Manual and differs from that stated in the INQS section 7.4.1.

The provision of timely open biopsy procedures continues to be an issue that requires attention. This should be investigated by lead providers and the NSU and remedied (Recommendation 4).

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 seven days of final diagnostic biopsy.

For all lead providers, the percentage of women receiving results within seven 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	Number and per cent of results within seven days for six months (1.1.02 – 30.6.02)		Cumulative number and per cent results within seven days (1.1.01 – 30.6.02)	
BSAN	269	83.0%	801	82.4%
BSM	76	73.8%	230	76.2%
BSCtoC	93	84.5%	255	87.6%
BSC	84	84.8%	245	84.5%
BSS	220	99.5%	720	96.5%
BSHC	29	87.9%	103	88.8%
Total	771	86.6%	2,354	86.6%

Note: The above table is derived from data, which is inconsistent with the data used in the production of Tables 2.9a and 2.9b. Some women, for whom no biopsy type is recorded, have a date of notification of a biopsy result recorded in the National Monitoring Data Set.

The timeliness of reporting assessment results has improved since the first BSAIMG monitoring reports. Most lead providers are now approaching the performance indicator of 90%, and one, BreastScreen South, continues to achieve and surpass 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 three 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.

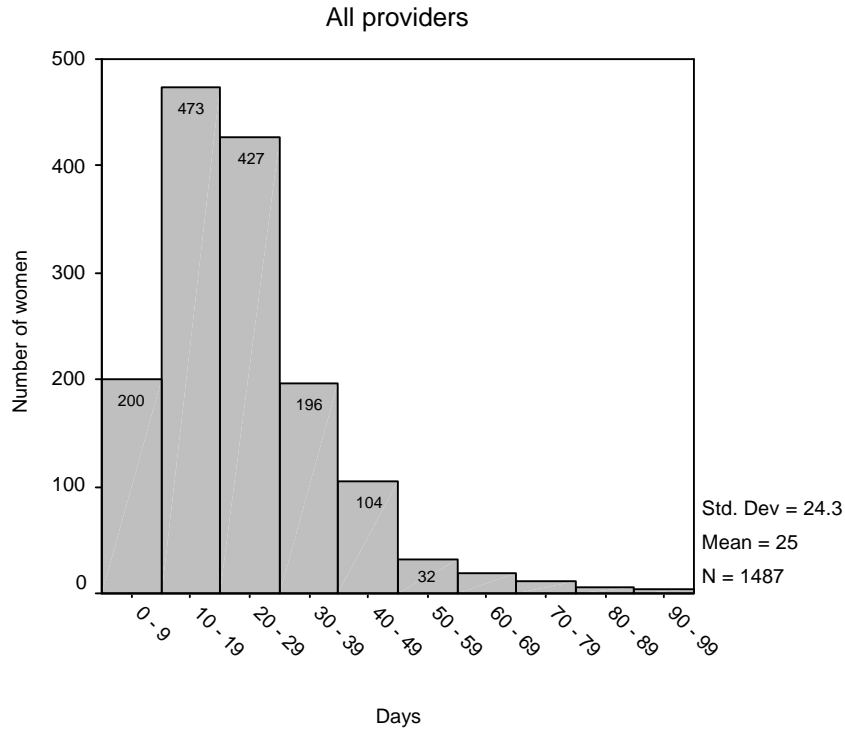
Lead Provider	Cumulative number and per cent of women offered primary treatment within three weeks 1.12.1998 – 30.9.2001	
BSAN	279	56.5%
BSM	141	65.3%
BSCtoC	132	73.3%
BSC	130	81.3%
BSS	224	70.2%
BSHC	89	81.7%
Total	995	67.3%

Note Lead providers have advised that they are unable to collect the date first offered primary treatment and that the date recorded is usually the date of primary treatment.

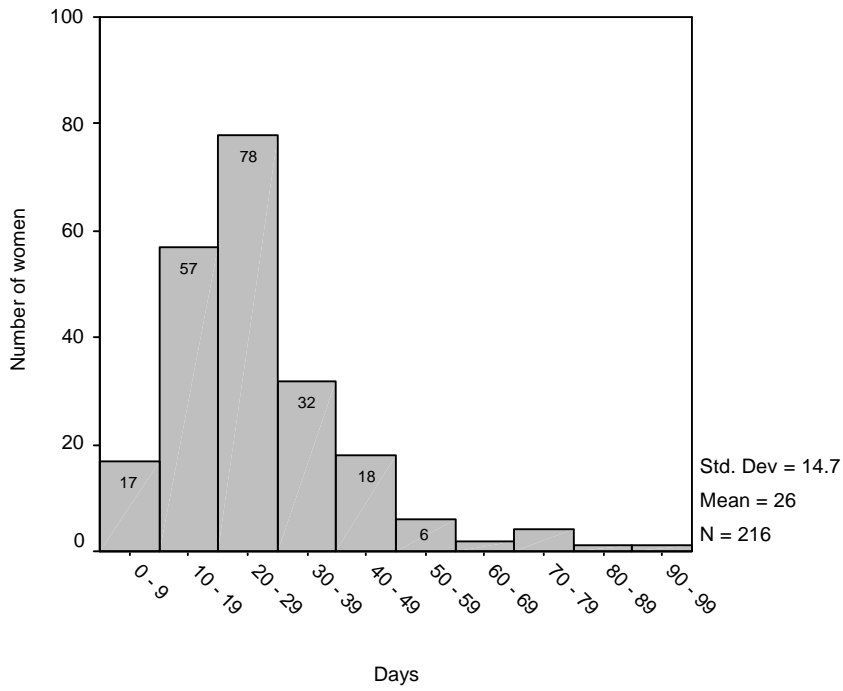
No lead provider met this performance indicator during the reporting period, and this continues to require attention (Recommendation 4). It is important to note that the first date of treatment may be out of the control of lead providers, and will be determined by the woman's choice about when she wishes to have surgery, and capacity of the local DHB, and private treatment providers. However, the reasons for these delays should be investigated to ensure that women do not need to wait longer than three weeks unless by choice.

Waiting times for surgery are shown in the charts (Figure 6) below, for BreastScreen Aotearoa overall, and each lead provider.

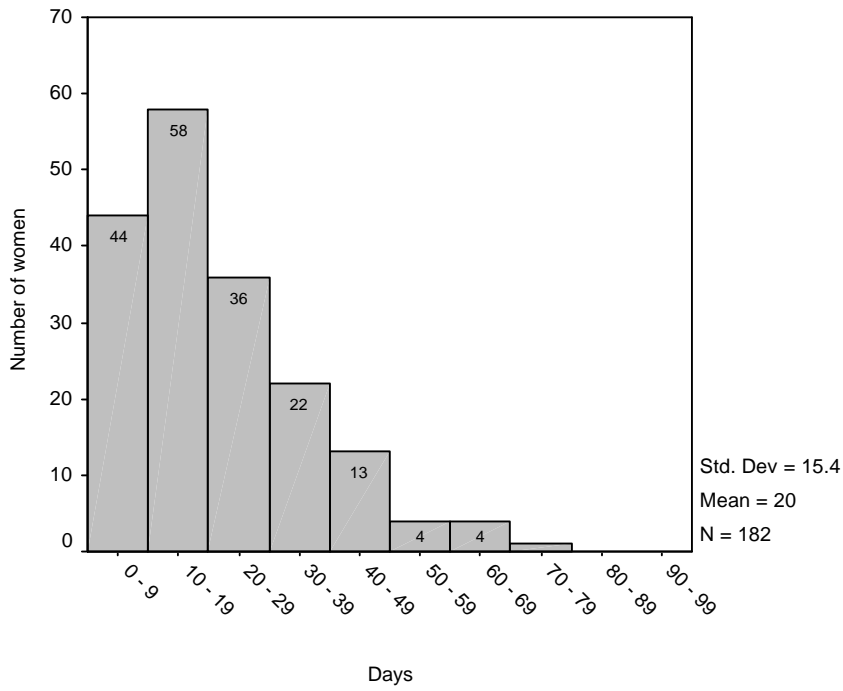
Figure 6 Waiting times for surgery for breast cancer for each lead provider and overall.



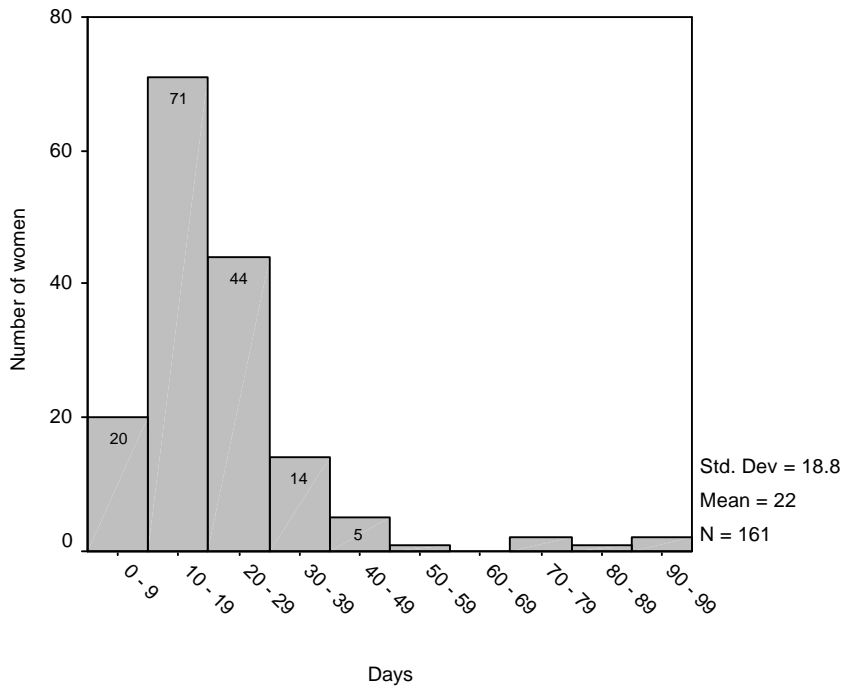
BreastScreen Midland



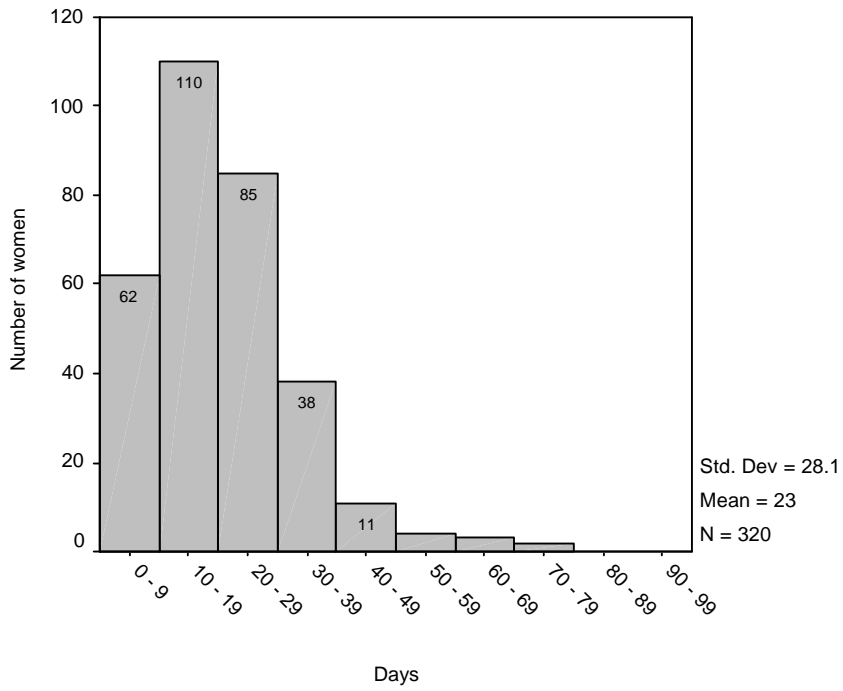
BreastScreen Coast to Coast



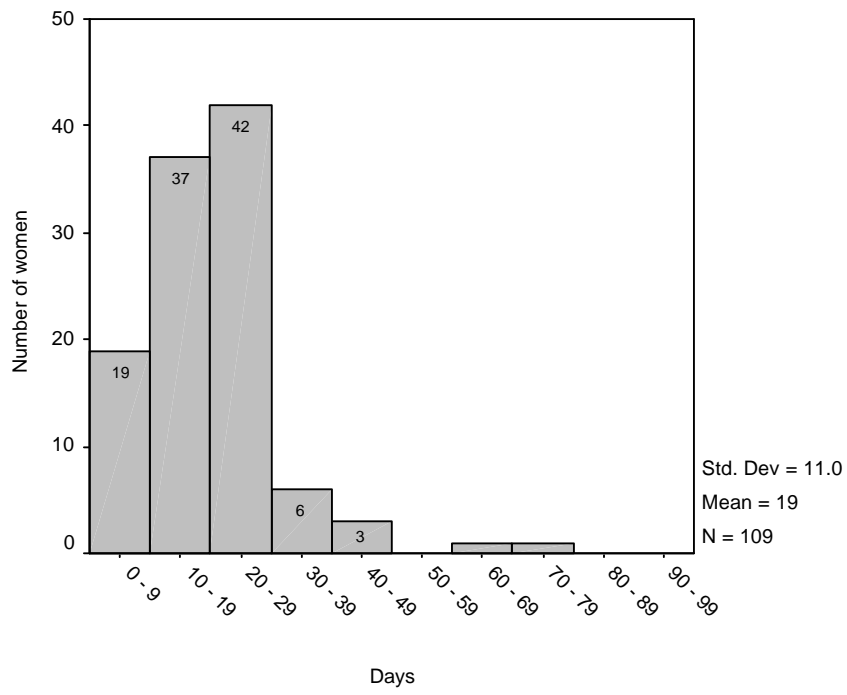
BreastScreen Central



BreastScreen South



BreastScreen HealthCare



References

1. Chamberlain J. BreastScreen Aotearoa: an independent review. May 2002.
2. European Commission. European guidelines for quality assurance in mammography screening (third edition). Luxemburg: European Communities, 2001.
3. Cohen SR, Payne DK, Tunkel RS. Lymphedema: strategies for management. *Cancer* 2001; 92: 980-7.

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 six-month 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 six-month reports is identified with an asterisk. Other information will be provided 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 ≥ 6 per 1,000 women screened in the prevalence round and ≥ 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 ≤ 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 1st and 2nd 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 every six months.

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 SIX MONTH REPORT PROCESS

- A3.1** BSAIMG receives cleaned data in agreed format from NZHIS within one month of end of six-month period.
- A3.2** BSAIMG drafts six-month report as agreed proforma within two months of end of six-month period.
- 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 six-month 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 six-month 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** Six-month and annual reports will include women screened and assessed in that six-month period who have a screening and final diagnosis recorded. Reports may include details of a previous screening period’s assessment data – if this occurs it will state which screening period 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).

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

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

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

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.

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

The priority for multiple ethnic group reporting is shown below:

Table 4 Multiple ethnic group reporting priority list.

Ethnic group	Priority for multiple ethnic group reporting
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.