

BreastScreen Aotearoa
MONITORING REPORT No. 5

**Women screened
between 1 April and 30 June, 2000**

**BreastScreen Aotearoa Independent Monitoring Group
Report to the Health Funding Authority**

14 December 2000

Technical Report No. 27
Hugh Adam Cancer Epidemiology Unit
Department of Preventive and Social Medicine
Dunedin School of Medicine
University of Otago

The BreastScreen Aotearoa Independent Monitoring Group

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

Dr Brian Cox, Public Health Physician

Dr Ann Richardson, Public Health Physician

Dr Jeremy Nicoll, Medical Physicist

Dr Norman Fitzgerald, Pathologist

Assoc. Prof. John Collins, Surgeon

Mrs Christine Rimene, Maori Health Researcher

Dr Anthony Doyle, Radiologist

Mrs Barbara Robson, Consumer Representative

Ms Thelma Brown is employed full-time to provide technical support to the monitoring group.

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

The monitoring group received data for this report on August 28, 2000. The draft report was written in November 2000 and was sent to the Health Funding Authority on November 6, 2000 for comment. The report was finalised on 14 December, 2000.

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Executive Summary

The monitoring of BreastScreen Aotearoa serves two main functions. First, to measure the performance of lead providers and the programme. Performance is measured against indicators where they have been set and among providers where no targets exist. Second, to identify issues in the follow-up of women.

This report shows that improvements have been made in several performance parameters, and in the collection and reporting of data.

Progress

BSAIMG has been able to report results for all six lead providers for all the specified indicators (apart from indicators relating to treatment data, which are not yet included in the national monitoring data set). The records of BreastScreen Midland from January 1999 to 30 June 2000 were 97% complete and it has been possible to include cumulative data for this lead provider in this report.

All lead providers have met the targets for technical repeats, open surgical biopsy rate, and specificity in this quarter. During the period from the establishment of BreastScreen Aotearoa to 30 June 2000, all lead providers appear to have met the cancer detection targets for prevalence or incidence screens where appropriate. All lead providers met the assessment rate target and the false positive rate target for prevalence screening. All providers except BreastScreen HealthCare met the target of at least 95% of women receiving their screening results within 10 days.

Due to the delay between the end of a quarter and the release of the monitoring reports, resolution of issues identified in reports may not become apparent until up to two further reports have been issued by BSAIMG unless the lead providers have independently identified the issues of concern and taken remedial action.

Outstanding issues

There are some outstanding issues and areas of concern to BSAIMG.

Coverage for the programme overall was 8% in this quarter. If a lead provider takes more than two years to cover the eligible population, that lead provider is likely to encounter major difficulties with scheduling. These difficulties would arise because the lead provider would have to start the second screening round for women who were first screened two years earlier, at the same time as trying to complete the initial screening round. Delays in offering second round screening to women would not be acceptable, since women have been promised regular two-yearly mammograms as part of BreastScreen Aotearoa. Both high coverage and timely second round screening are important determinants of effective screening.

Although all lead providers have met the target for the rate of referral to assessment for prevalence screening, BreastScreen HealthCare, undertaking mainly incidence screening, continues to fail by a considerable margin to achieve the assessment rate target for incidence screening. Similarly this lead provider has failed to meet the false positive rate target for incidence screening. This problem was highlighted in Monitoring Reports 2, 3, and 4. The timing of the release of monitoring reports to lead providers means that some issues identified persist for some time before improvements can be seen in subsequent monitoring

reports. Report Number 2 was first provided to lead providers in draft form in March, 2000. Therefore, some resolution of this anomaly would be expected to appear in this report. However, referral to assessment continued to be high in this quarter, though, some improvement in the false positive rate and specificity for this provider occurred.

BSAIMG remains concerned about incomplete assessment records. BreastScreen Auckland and North, Breast Screen HealthCare, and BreastScreen Central have outstanding assessment records of duration 6 months or more, for more than 1% of women referred for assessment. Of particular concern, Breast Screen HealthCare and BreastScreen Central have assessment records outstanding for 6 months or more for, respectively, 5.1% and 4% of women referred for assessment.

Default values have been entered for benign biopsy weights, where the pathologists reporting the histology results have not provided lead providers with actual weights. The current review of the National Quality Standards being conducted by the HFA is reviewing the specifications for this indicator. BSAIMG recommends that the completeness and accuracy of the data collected be checked. Misleading results should not be entered into the national monitoring data set.

All lead providers except BreastScreen HealthCare met the target of 95% of women notified of their screening result within 10 working days of screening in this quarter and up to June 30, 2000. Delays in notification of screening results may create anxiety in women, which could potentially reduce programme acceptability and rescreening rates. Expected improvement is not yet seen in the monitoring reports, possibly due to the time available for corrective action between the release of the monitoring report and the provision of data to the HFA by lead providers for a subsequent report.

None of the lead providers have reached the target of 90% of women offered an assessment appointment within 14 working days of their final screening mammogram. This has been of concern in previous monitoring reports.

From the national monitoring data set, up to the end of June 2000, BreastScreen Central and BreastScreen Coast to Coast have now been able to meet the target for reporting the results of a final biopsy to women within a reasonable time (compared with no lead providers in the last quarter). The other four lead providers were unable to meet this indicator. Overall however, the programme was performing below the target set. BSAIMG have been advised that computer software validation rules for data entry of the relevant fields may have been a problem. If so, this needs to be rectified.

These results suggest that the assessment and reporting processes of many lead providers may not be sufficiently organised to meet the indicators, but that improvements have been made. It was recommended in previous reports that the administration of this reporting process needed to be reviewed and improvements made. This continues to be required for those lead providers who have failed to reach the indicators. The HFA will consider what is necessary for the indicators to be reached.

Table 1. Summary of lead provider and BreastScreen Aotearoa results against targets to 30 June, 2000.

Indicator	Lead Providers						
	ABS	HWL	MCH	HVH	BSS	BSHC	BSA
Coverage (%)							
<i>- Target > 70% in two years, equivalent to 52.5% in 18 months</i>							
Overall	37.4	39.9	42.7	40.1	51.1	56.3	42.7
Maori	32.8	25.7	23.1	22.1	22.3	19.9	26.8
Pacific	25.9	30.9	23.5	17.3	29.8	25.0	24.9
Other	36.9	41.8	42.5	38.9	43.7	55.9	41.5
(not stated)†	(1205)	(153)	(1142)	(871)	(4177)	(327)	(7875)
Technical recall (%)							
<i>- Target (Fixed < 0.5%; Mobile < 3%)</i>							
Fixed	0.03	0.3	0.3	0.8	0.4	0.2	0.3
Mobile	0.1	3.5	6.5	1.1	1.6	0.7	2.2
Technical repeat (definition 2) (%)							
<i>Target < 3%</i>							
Fixed	1.2	0.9	1.2	2.1	1.7	1.2	1.3
Mobile	0.2	0.9	1.3	0.5	0.5	0.1	0.6
Assessment (%)							
<i>Target - prevalence screen - target is <10%, expected target is <7%</i>							
<i>- incidence screen - target is <5%, expected target is <4%</i>							
	7.5	5.6	5.1	6.2	6.6	8.1	6.6
False positive rate (%)							
<i>Target - prevalence round, target is <9%, expected target <6%</i>							
<i>- incidence round, target is <4%, expected target <3%</i>							
	6.5	5.0	4.3	5.2	5.8	7.0	5.7
Open surgical biopsy rate (%)							
<i>Target < 1%</i>							
	0.3	0.2	0.3	0.2	0.2	0.7	0.3
Benign biopsy weight (%) #							
<i>Target 80% or more benign open biopsy should weigh <20g</i>							
	43.8	#	#	33.3	38.9	77.1	52.2

† number of women where ethnicity was not recorded

default values entered by some lead providers where actual weights unavailable

....continued

Table 1 (continued).

Summary of lead provider and BreastScreen Aotearoa results against targets to 30 June, 2000.

Indicator	Lead Providers						
	ABS	HWL	MCH	HVH	BSS	BSHC	BSA
Needle biopsy rate (%)							
<i>Target – none</i>							
FNA	0.2	0.4	0.1	0.2	1.0	0.6	0.4
Core needle	2.4	1.2	1.3	0.6	1.8	0.8	1.6
Both	0.2	0.01	0	1.4	0.1	0.03	0.2
Total	2.8	1.61	1.4	2.2	2.9	1.43	2.2
Specificity (%)							
<i>Target >93%</i>							
	93.5	95.0	95.7	94.7	94.1	92.9	94.2
Cancer detection rate (per thousand women screened)							
<i>Target - prevalence - ≥6 per 1000 women screened</i>							
<i>- incidence - ≥3 per 1000 women screened</i>							
	8.1	5.5	6.7	6.2	6.6	5.6	6.8
Time taken providing results of screening (%)							
<i>Target – at least 95% notified within 10 days</i>							
	96.9	99.1	98.8	97.9	97.7	65.6	94.6
Time taken from screening visit to first offer of an assessment appointment (%)							
<i>Target – at least 90% offered an assessment appointment within 14 working days of their final screening visit</i>							
	61.9	84.4	85.7	87.6	76.2	29.8	68.8
Time taken from assessment to final diagnostic biopsy (%)							
<i>Target 1 – at least 90% of women requiring needle biopsy procedure have that procedure completed within 7 days of their assessment</i>							
	100	78.1	94.3	94.9	87.1	96.5	93.0
<i>Target 2 – at least 90% of women requiring open biopsy procedure offered that procedure within 3 weeks of their assessment</i>							
	53.6	18.0	30.2	62.5	62.8	88.8	56.0
Time taken from final diagnostic biopsy to reporting assessment result (%)							
<i>Target – results reported to at least 90% of women within 7 days of final diagnostic biopsy</i>							
	73.3	57.5	82.6	86.3	51.1	57.6	67.7
Time taken from reporting assessment results to first date offered for primary treatment (%)							
<i>Target – at least 90% of women offered primary treatment within 3 weeks of the final diagnosis being reported to the women</i>							
	*	*	*	*	*	*	*

* Invalid or insufficient data available for reporting - treatment data are not yet recorded as part of the national dataset.

National Monitoring Data Set and service issues encountered

Data for the national monitoring data set is supplied to the NZHIS by lead providers. Some validation checks are then performed before the data is sent to the HFA for supply to the BSAIMG. Therefore, not all data issues of the national monitoring data set that arise originate at the level of the lead provider or their subcontractors.

Missing data.

The HFA advised that the August 2000 transfer of the national monitoring data set contained 97% of all BreastScreen Midland's records from January 1999 to 30 June 2000. This cumulative data is now available for this lead provider and has been included in this report.

Outstanding data.

Assessment records of the national monitoring data set continue to be incomplete. Currently assessment results are only forwarded to BSAIMG when the assessment process is complete, however, indication of the decision to refer for assessment is forwarded. Until the assessment process has been completed and the assessment results included, the screening record for that woman is incomplete. Reasons for incomplete assessment vary, but possible reasons include:

- extended assessment (where a woman is not given a definitive diagnosis after assessment, but is asked to return for further assessment after a specified interval, commonly 6 or 12 months but it may be longer).
- women exiting the programme.
- women failing to attend a scheduled assessment appointment.
- failure of the lead provider to notify a woman after a recommendation for assessment is made.
- failure of a lead provider to provide an assessment appointment to a woman after a recommendation for assessment.
- data entry problems.

Unfortunately, BSAIMG has no means of determining from the national monitoring data set why the result is incomplete. BSAIMG has requested information on the status of all women with incomplete assessment records. It is important that the current status of *all* women with assessment records outstanding is determined. A woman with an abnormality detected by mammography is potentially at high risk of breast cancer, and the programme must ensure that these women have been offered appropriate investigation and treatment if necessary.

Information provided to BSAIMG in response to our request for information on the current status of all women with assessment records outstanding, shows that most women have received appropriate investigation. Nevertheless, missing data or inadequate data for some women means that BSAIMG is still not reassured about the status of all these women.

BSAIMG recommends that the HFA urgently take action to obtain the appropriate data. For women who were referred for assessment and whose assessment record is incomplete, if on inquiry no assessment has occurred, BSAIMG recommends that they be recalled for immediate assessment. The HFA continues to investigate the reporting process for women with incomplete records.

BSAIMG recommends that a mechanism be instituted for reporting incomplete assessment results (including the reason for the record to be incomplete) to BSAIMG.

Duplicate NHI numbers.

The HFA provided BSAIMG with a list of women who had transferred between regions from January 1999 to 30 June 2000 with details from and to which lead provider they had transferred. BSAIMG have excluded these women from the registration, screening and assessment tables in this report, as assignation of these results to one lead provider may not be appropriate. This problem will continue, and the numbers of women involved will increase if the databases for the six different lead providers remain separate. A single national database for BreastScreen Aotearoa should avoid this problem. Failing this, in future BSAIMG may need to assign a single lead provider to women who transfer, for the purposes of the monitoring reports. BSAIMG recommends that the HFA consider the option of developing a single national breast screening database.

The national monitoring data set also included a list of duplicate entries in the registration data file. The duplicate entries were deleted by BSAIMG. BSAIMG have been advised that a duplicate entry probably occurs when a woman registered with one lead provider moves (after registration, but before being screened) and is screened through another provider.

As for previous monitoring reports, BSAIMG also deleted duplicate entries from the screening detail file of the national monitoring data set. These records contained identical NHI numbers but different lead provider codes. In the registration file of the national monitoring data set, some entries recorded by NHI number had more than one source of identification recorded, or more than one date of birth, or more than one domicile code registered with more than one lead provider. These duplicate entries were also excluded from the data set used for this report.

BSAIMG recommends that lead providers and the HFA investigate these duplicate NHI numbers. It could be potentially hazardous for two women to have the same NHI number. Reliance on the NHI number for the identification of women by service providers for assessment could result in the wrong woman being investigated for breast cancer, while the affected woman remained untreated. However, the same issue arises for anybody receiving diagnosis or treatment in the health service and it is not specific to the breast screening programme. Women screened by one lead provider, but assessed by another lead provider can also appear as duplicate entries. This is a limitation of a system, which is not truly a national database, but the combination of six separate lead provider databases. There is potential for women to be placed at risk if BSAIMG is unable to track their results following an assessment performed by a different lead provider from the screening lead provider. BSAIMG is aware that considerable effort is required by the National Cervical Screening Programme to avoid duplicate NHI numbers in the national cervical screening register.

Screening episode and round number.

The data field for screening episode is the field that BSAIMG intends to use to calculate results for incident and prevalent screens. The HFA advised that BreastScreen Midland data include incorrect screening episode numbers for women who were screened in the Waikato pilot breast cancer screening programme. The issue is scheduled to be resolved by late December 2000 with the corrected data available to BSAIMG in the February 2001 data transfer.

Ethnic affiliation.

No specific ethnic affiliation was recorded for 1,180 (5.2%) of the screening records for this quarter. The cumulative number of women with no specific ethnicity stated, was 7,875 or

6.5% of all women screened. BSAIMG continues to recommend that all lead providers encourage women to assign ethnicity appropriately wherever possible.

Type of screening unit.

All lead providers recorded screening site in the national monitoring data set for this quarter. However, earlier recording of the type of screening unit for BreastScreen South has not yet been corrected in the national monitoring data set so that the cumulative records for indicators that use the type of screening unit have not been listed in this report.

Technical repeat and recall rates.

The HFA continue to work with lead providers to develop a consistent understanding of definitions associated with these data items.

Referral to assessment.

All lead providers have a referral to assessment rate recorded for the quarter. Cumulative records for each lead provider are also available.

Recommendations regarding service issues encountered

1. Coverage.

Coverage for BreastScreen Auckland and North, BreastScreen Coast to Coast, and BreastScreen Central was below the 9% needed to achieve the target of 70% over two years. Lead providers should calculate their coverage using projected populations for 1999/2000 from the 1996 Census (see Appendix B) and compare it to the percentages supplied in Table 1.3.1. Any lead providers who are behind in their coverage should make every effort to increase their screening rates. At present there is a window of opportunity where lead providers are still some months from the commencement of the second screening round. This window should be used to screen as many women as possible, in order to avoid the potential difficulties of trying to complete a screening round at the same time as beginning the second screening round. Delays in offering second round screening to women would not be acceptable, since women have been promised regular two-yearly mammograms as part of BreastScreen Aotearoa.

2. Ethnic coverage.

If lower screening coverage of Maori and Pacific women recorded in this report persists, the invitation process may need to be reviewed to establish whether it is due to a lack of, or ineffective, invitation for these women. Some preliminary investigation of reasons for the lower coverage of Maori and Pacific women is required.

3. Technical Recall Rate.

Investigation of the reasons for the high technical recall rate for BreastScreen Coast to Coast at their mobile site is required.

4. Referral to assessment rate.

Epidemiological measures of the quality of the assessment process should produce an appropriate combination of referral to assessment rate, cancer detection rate, sensitivity, specificity and false positive rate. Four of these measures of performance are calculated for the six lead providers in this report (sensitivity cannot be estimated this early in the programme). BreastScreen HealthCare, which is mainly undertaking incidence screening, continues to have relatively high rates of referral to assessment, in combination with relatively low specificity and a high false positive rate for a provider. The reasons for the relatively high rate of referral need to be investigated to determine its cause and efforts to reduce the referral rate should be made. If the relatively high rate of referral is

due to a particular practice of a radiologist then some retraining with subsequent re-evaluation of performance should be undertaken. Changes in this indicator, resulting from the effect of measures undertaken to resolve this anomaly, are expected in the next report.

5. *Extended assessment.*

The incomplete assessment records in the national monitoring data set raise concern that some women may be undergoing extended assessment. Sometimes this is called early recall, deferred assessment, periodic mammographic follow-up or other similar terms. This is where a clear decision about whether a woman should be referred for assessment is deferred, and instead, the woman is asked to return for another mammogram after an interval of some months (the interval varies) or to return to assessment clinic for further investigation. This is not considered by the monitoring group, or we believe internationally, to be best practice. This view was confirmed by an international expert at the recent 4th Leura International Breast Cancer Conference in Australia.

No national protocol yet exists for this practice and considerable variation in its application is likely. It is clear from the information provided to us by the HFA from lead provider analysis of incomplete assessment records, that extended assessment is occurring. Some women in this group may develop clinical cancer while no decision of screening is reached, while for many asymptomatic women considerable anxiety from an abnormal result would not be alleviated. The current review of the National Quality Standards is expected to result in a policy for the HFA on the issue of extended assessment.

Under current data collection processes, the assessment records of these women may not become part of the national monitoring data set until their assessment has been completed and this may be up to two years after the date of screening. As a consequence, BSAIMG is unable to monitor the practice of extended assessment. This needs to be made transparent in the national monitoring data set.

In this quarter, BreastScreen Auckland and North, BreastScreen Healthcare, and BreastScreen Central have outstanding assessment records of duration six months or more, for more than 1% of women referred for assessment. Of particular concern, BreastScreen Central has assessment records outstanding for six months or more for 4% of women referred for assessment and BreastScreen HealthCare has assessment records outstanding for six months or more for 5.1% of women referred for assessment. It is recommended that BreastScreen Central and BreastScreen HealthCare urgently complete these assessment records.

6. *Open surgical biopsy*

It is recommended that BreastScreen HealthCare evaluate its core needle and open biopsy rates.

7. *Needle biopsy rate.*

Explanation of the different use of needle biopsy procedures by BreastScreen Central should be requested by the HFA from this provider. If FNA is considered to produce uncertain results then core biopsy should be used as an alternative rather than an additional procedure.

8. *Inter-rater and intra-rater reliability of radiological reporting.*

It is recommended that inter-rater and intra-rater reliability should be routinely calculated for all radiologists who read screening films for lead providers.

Because of its relatively high referral rate, low specificity, and high false positive rate for a provider carrying out mostly incidence screening, it was recommended in the previous monitoring report that BreastScreen HealthCare undertake a review of film reading. BSAIMG is aware that film reading is a complex task, and that it is difficult to increase specificity while maintaining high sensitivity, but recommended that BreastScreen HealthCare carry out a review, with the aim of increasing specificity while maintaining appropriate sensitivity.

BSAIMG now recommends that the HFA seek confirmation from BreastScreen HealthCare that an appropriate review of film reading, including measurement of inter- and intra-rater reliability, has been undertaken.

9. *Timeliness of reporting screening results.*

As indicated in Monitoring Report Number 3, BreastScreen HealthCare needs to improve the timeliness of the reporting of screening results to women. Due to the standard delay between the release of monitoring reports and the provision of data for subsequent reports improvements in this indicator may not be apparent until monitoring report number 6 is produced.

10. *Timeliness of first offer of an assessment appointment.*

As recommended in previous reports, the HFA should seek explanation from those lead providers who are unable to meet the target as to why there is ongoing difficulty in ensuring women are offered an assessment appointment within 14 working days of their final screening visit as recorded in the national monitoring data set.

11. *Timeliness of open biopsy.*

All lead providers recorded delays beyond the target in offering women an open biopsy procedure within three weeks of their assessment for this quarter. BreastScreen Midland and BreastScreen Central were significantly below the target, which is of concern. It was recommended in Monitoring Report Number 3 that the organisation and availability of these diagnostic services needed to be investigated by all lead providers and improved immediately. Improvement in this indicator will be expected by BSAIMG in the next monitoring report.

From the cumulative record of the national monitoring data set, none of the lead providers have been able to offer 90% or more of the women who need it an open surgical biopsy within three weeks of their assessment appointment. The HFA should seek explanation from lead providers as to why it appears from the national monitoring data set that there is ongoing difficulty in ensuring women are offered an open surgical biopsy within an appropriate timeframe.

12. *Time taken from final diagnostic biopsy to reporting assessment results.*

As recommended in Monitoring Report Number 4, considerable improvement needs to be made in timeliness of reporting or accuracy of dates entered in the database by some lead providers for this target to be met.

Recommendations regarding data issues encountered

1. *Correction of the historical record for some data fields.*

Some fields of the national monitoring data set have not been correctly entered in the past, for example, ethnicity and screening site. Whilst these may have been changed in the lead provider systems they are not recorded in the national monitoring data set.

2. *Validation procedures for some fields.*

Some of the fields used to calculate technical recall and technical repeat rates need to be validated. The definitions of these indicators are currently being ratified by the HFA. A sample of records where technical repeats or technical recalls have occurred should be reviewed to see whether the information has been appropriately captured in the national monitoring data set.

3. *Outstanding assessment results.*

If the problem of incomplete assessment records is not addressed, there is a danger that the number of incomplete assessment records may become too great to be easily corrected. This could jeopardise the ability of the BSAIMG to monitor many aspects of the assessment process. BSAIMG has identified records of women for whom assessment records of the national monitoring data set were incomplete. When the case records of these women are checked to determine what their outcome of assessment has been or whether they are part of an extended assessment process this information needs to be incorporated into the national monitoring data set. BSAIMG understands that this is being conducted by the HFA. For women who were referred for assessment and whose assessment record is incomplete, if on inquiry no assessment has occurred, BSAIMG recommends that they be recalled for immediate assessment.

BSAIMG recommends that a mechanism be instituted for reporting incomplete assessment results (including the reason for the record to be incomplete) to BSAIMG.

4. *Benign biopsy weight.*

The completeness and accuracy of the data collected needs to be checked. It is important to monitor biopsy weights, to ensure that women are not undergoing disfiguring surgery resulting from unnecessarily large biopsies. Lead providers should make every effort to obtain the required information from pathologists. The current review of the National Quality Standards being conducted by the HFA is reviewing the specifications for this indicator. Pathologists reporting histology results for BreastScreen Aotearoa should be aware of the requirement for specimen weights to be reported. Misleading results, for this or any other field should not be entered into the national monitoring data set.

1. Data Summary

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

ABS = BreastScreen Auckland and North

HWL = BreastScreen Midland

MCH = BreastScreen Coast to Coast

HVH = BreastScreen Central

BSS = BreastScreen South

BSHC = BreastScreen HealthCare

1.1 Registration rate - overall

Registration is completed when a woman has completed a registration and informed consent form. The registration rate was 7.7% in this quarter with an overall registration rate of 47.8% to June 30, 2000. The date of registration is not recorded and, therefore, BSAIMG is only able to calculate total registrations in the national monitoring data set. Numbers of registrations for the quarter are then calculated by the difference in total registrations between periods. If lead providers were to screen women at the rate required to reach 70% coverage, at least 9% of the eligible women in any region should be registered and screened in each quarter (section 1.3). BreastScreen Auckland and North, BreastScreen Coast to Coast, BreastScreen Central, and BreastScreen HealthCare have registered fewer than 9% of the eligible women in their region in this quarter. BreastScreen Midland and BreastScreen South recorded over 11.5% registration for the quarter. Registrations have dropped for all lead providers in this quarter compared to the previous quarter. It is of particular concern that registrations have dropped even for those lead providers who, previously failed to reach 9%.

The numbers of women registered by BreastScreen Aotearoa are shown in Table 1.1.

Table 1.1. Overall registration rates by lead provider.

Lead provider	Quarterly number registered (% of projected population)		Cumulative number registered (% of projected population)	
ABS	4,909	(5.1)	38,314	(39.7)
HWL	5,236	(11.6)	27,382	(60.4)
MCH	2,321	(6.0)	17,268	(45.0)
HVH	2,014	(6.4)	12,979	(41.4)
BSS	5,789	(11.5)	27,371	(54.2)
BSHC	1,424	(6.7)	12,068	(56.5)
TOTAL	21,693	(7.7)	135,382	(47.8)

1.2 Registration rate – ethnicity

Of the 135,382 women registered with the programme, 7,965 were Maori, 2,447 were Pacific women, 116,476 were of other ethnicity and for 8,534 ethnicity was not stated (Table 1.2). This represented 32.6%, 28.7% and 46.5% of the Maori, Pacific Island and other ethnic groups (includes those of solely European descent), respectively. The proportion of women for whom ethnicity was not stated at registration decreased for BreastScreen Midland for this quarter compared to the previous quarter. Therefore, no total for the not stated category is provided and the figure for BreastScreen Midland has been omitted. The registration rate varied by lead provider from 1.7% for BreastScreen Auckland and North to 9.4% for BreastScreen South.

Table 1.2. Registration rates by ethnicity for each lead provider.

Lead provider	Quarterly number registered (% of projected population)				Cumulative number registered (% of projected population)			
	Maori	Pacific	Other	Not stated	Maori	Pacific	Other	Not stated
ABS	374 (4.6)	300 (5.0)	4,179 (5.1)	81	2,892 (35.3)	1,766 (29.2)	32,426 (39.4)	1,230
HWL*	637 (9.8)	44 (10.2)	5,058 (13.2)		2,785 (42.7)	227 (52.4)	23,784 (62.0)	586
MCH	202 (4.2)	9 (3.1)	2,040 (6.1)	71	1,165 (24.2)	72 (24.6)	14,872 (44.6)	1,159
HVH	84 (3.9)	32 (2.4)	1,674 (6.0)	226	497 (23.2)	245 (18.4)	11,321 (40.6)	916
BSS	131 (7.0)	37 (11.4)	5,078 (10.5)	544	451 (24.2)	110 (33.8)	22,536 (46.6)	4,274
BSHC	23 (2.6)	2 (1.9)	1,368 (6.7)	31	175 (20.2)	27 (25.0)	11,537 (56.6)	329
TOTAL	1,451 (5.9)	424 (5.0)	19,397 (7.7)		7,965 (32.6)	2,447 (28.7)	116,476 (46.5)	8,494

* BreastScreen Midland cumulative figure decreased and quarterly figure was negative.

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.

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

From the national monitoring data set, at least 120,424 women had a screening mammogram as part of BreastScreen Aotearoa up to June 30, 2000 (Table 1.3). Overall, approximately 42.7 % of all women aged 50-64 years were screened in the programme.

Coverage has been measured by dividing the number of eligible women screened by the number of eligible women expected from projected annual mean usually-resident population projections derived from the 1996 census. Coverage rates are shown as percentages for each lead provider and for the whole country. The target screening coverage for BreastScreen Aotearoa is greater than 70% of women aged 50-64 years after two years of screening.

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

Lead provider	Quarterly number screened (% of projected population)		Cumulative number screened since December 1998 (% of projected population)	
ABS	6,173	(6.4)	35,856	(37.4)
HWL	3,850	(8.5)	17,980	(39.9)
MCH	2,188	(5.7)	16,483	(42.7)
HVH	2,176	(7.0)	12,399	(40.1)
BSS	6,134	(12.1)	25,792	(51.1)
BSHC	1,981	(9.4)	11,914	(56.3)
TOTAL	22,502	(8.0)	120,424	(42.7)

In each three-month quarter, based on a target of 70% coverage, lead providers would need to screen, on average, just under 9% of eligible women. Only BreastScreen HealthCare and BreastScreen South screened at least 9% of the eligible women in their region in the last quarter. It is very important for lead providers to maintain adequate screening coverage. If a lead provider takes more than two years to cover the eligible population, that lead provider is likely to encounter major difficulties with scheduling. These difficulties would arise because the lead provider would have to start the second screening round (for women who were first screened two years earlier), at the same time as trying to complete the initial screening round. The potential risk is that the lead provider would fail to meet the required two-year screening interval. Any increase in the length of the screening interval will decrease the ability of BreastScreen Aotearoa to reduce breast cancer mortality.

Because different lead providers (and their sub-contractors) started screening at different times, expected coverage will differ by lead provider. BSAIMG has

commencement dates for the main fixed screening units and mobile units for each lead provider, but does not have commencement dates for all sub-contractors. Therefore, Table 1.3.1 below is provided to enable lead providers to calculate their expected coverage, (based on the target of 70% coverage), according to the month of commencement of screening. Lead providers can monitor their own progress by dividing the number of women screened at 30 June 2000 by the number of women in each region or sub-contractor region.

Table 1.3.1. Expected coverage by 30 June 2000, according to month of commencement of screening (assuming at least 70% coverage of the target population)

Date of commencement	Expected coverage (% of eligible population screened by 30 June 2000)
1 December 1998	55.4%
1 January 1999	52.5%
1 February 1999	49.6%
1 March 1999	46.7%
1 April 1999	43.8%
1 May 1999	40.8%
1 June 1999	37.9%
1 July 1999	35.0%
1 August 1999	32.1%
1 September 1999	29.2%

For the nineteen months to June 30, 2000, this target represents 55.4% of eligible women. Due to delays in the start of screening and the availability of mobile screening units, some lead providers will have lower than expected coverage for 1999. From the data provided for this report BreastScreen Coast to Coast has the lowest overall screening coverage for the quarter at 5.7% and BreastScreen South the highest coverage at 12.1% of the projected population. BreastScreen Auckland and North, BreastScreen Coast to Coast and BreastScreen HealthCare had lower coverage rates compared to the previous quarter.

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 by lead provider in Table 1.4. For the majority of lead providers, slightly higher coverage was achieved in the younger age groups in this quarter but overall the opposite trend existed for the cumulative number screened.

Table 1.4. Age specific number of women screened and per cent coverage by lead provider.

Lead provider	Quarterly number screened (% of projected population)			Cumulative number screened (% of projected population)		
	50-54	55-59	60-64	50-54	55-59	60-64
ABS	2,915 (7.1)	1,844 (6.0)	1,414 (5.9)	15,493 (38.0)	11,243 (36.4)	9,120 (37.7)
HWL	1,544 (8.6)	1,366 (9.3)	940 (7.5)	5,944 (33.2)	6,140 (41.9)	5,896 (46.9)
MCH	958 (6.2)	648 (5.3)	582 (5.4)	6,713 (43.1)	5,190 (42.1)	4,580 (42.7)
HVH	979 (7.4)	675 (6.8)	522 (6.6)	5,159 (39.2)	4,096 (41.5)	3,144 (39.9)
BSS	2,629 (12.5)	1,870 (11.7)	1,635 (12.1)	10,729 (51.0)	7,992 (50.0)	7,071 (52.3)
BSHC	762 (8.8)	619 (9.3)	600 (10.4)	4,733 (54.6)	3,921 (58.6)	5,790 (56.3)
TOTAL	9,787 (8.4)	7,022 (7.8)	5,693 (7.6)	48,771 (41.6)	38,582 (42.7)	33,071 (44.3)

1.5 Coverage - ethnicity

Coverage up to June 30, 2000, was lower among Maori and Pacific women compared to other, mainly European, ethnic groups. This continues the trend from previous quarters. Coverage of Maori women by BreastScreen Auckland and North exceeded coverage of other ethnic groups in this quarter.

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

Lead provider	Quarterly number screened (% of projected population)				Cumulative number screened (% of projected population)			
	Maori	Pacific	Other	Not stated	Maori	Pacific	Other	Not stated
ABS	539 (6.6)	286 (4.7)	5,250 (6.4)	98	2,683 (32.8)	1,567 (25.9)	30,401 (36.9)	1,205
HWL	335 (5.1)	13 (3.0)	3,495 (9.1)	7	1,676 (25.7)	134 (30.9)	16,017 (41.8)	153
MCH	221 (4.6)	10 (3.4)	1,862 (5.6)	95	1,114 (23.1)	69 (23.5)	14,158 (42.5)	1,142
HVH	95 (4.4)	22 (1.7)	1,843 (6.6)	216	473 (22.1)	231 (17.3)	10,824 (38.9)	871
BSS	131 (7.0)	27 (8.3)	5,253 (10.9)	723	415 (22.3)	97 (29.8)	21,103 (43.7)	4,177
BSHC	36 (4.1)	2 (1.9)	1,902 (9.3)	41	173 (19.9)	27 (25.0)	11,387 (55.9)	327
TOTAL	1,357 (5.6)	360 (4.2)	19,605 (7.8)	1,180	6,534 (26.8)	2,125 (24.9)	103,890 (41.5)	7,875

If improvements in the proportion of Maori and Pacific women screened are made, the differences in coverage between ethnic groups may not be as great at the end of the two-year screening cycle. However, if coverage continues to be low, the lack of information about the number of women identified and invited will make discernment of the reasons for low coverage difficult, as it will not be known if the cause is a lack of personal invitation or rejection of the invitation. The number of women choosing not to state their ethnicity could also affect this. Therefore, it will be difficult to target possible remedies for low coverage.

2. Provision of high quality screening and assessment

The national monitoring data set was more complete for this report with five lead providers having quarterly and cumulative results recorded. BreastScreen South cumulative results when separated by screening site are excluded as corrections to these data are yet to be reflected in the national monitoring data set.

Many of the data coding problems recorded in previous reports appear to have been rectified in the national monitoring data set for this quarter.

2.1 Screened women who have no more than 4 films taken.

Target - Minimum of 80% of women screened have 4 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 4 films or less at screening by lead provider.

Lead Provider	Quarter (%)		Cumulative rate (%)	
	Fixed	Mobile	Fixed	Mobile
ABS	85.2	74.0	89.6	97.4
HWL	88.7	79.4	87.6	83.1
MCH	85.5	71.3	87.4	83.8
HVH	84.6	95.7	89.3	97.0
BSS*	68.8	75.4		
BSHC	73.0	67.1	74.5	74.5
TOTAL	80.0	81.9	87.3	86.0

*BreastScreen South cumulative records excluded.

BreastScreen HealthCare and BreastScreen South continue not to meet the target for the proportion of women screened who had four films or less at screening. Other lead providers appear to have met this target.

2.2 Technical recall rate

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

Target - Mobile < 3%
 - Fixed < 0.5%

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

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

Lead Provider	Quarter (%)		Cumulative rate (%)	
	Fixed	Mobile	Fixed	Mobile
ABS	0	0.6	0.03	0.1
HWL	0.4	3.5	0.3	3.5
MCH	0.2	7.0	0.3	6.5
HVH	1.4	1.7	0.8	1.1
BSS	0.6	0.4		
BSHC	0.3	2.0	0.2	0.7
TOTAL	0.4	2.4	0.2	2.3

*BreastScreen South cumulative records excluded.

All lead providers except BreastScreen Central and BreastScreen South met the target for technical recalls to the fixed unit. BreastScreen Midland and BreastScreen Coast to Coast recorded a quarterly result above the target for technical recalls to a mobile unit. BreastScreen Auckland and North appear to have a different practice for technical recalls than other lead providers. As in Monitoring Report Number 2 it is suggested that the values in the fields (used to calculate technical recall and repeat rates) in the national monitoring data set require validation.

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.

Target - <3%

BSAIMG consider that the definition of technical repeats in the Data Management Manual is incorrect. This will be addressed in the HFA 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.

Target - < 3%.

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

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

Lead Provider	Quarterly technical repeat rate		Cumulative technical repeat rate	
	Fixed	Mobile	Fixed	Mobile
ABS	1.0	0.2	1.2	0.2
HWL	0.7	0.7	0.9	0.9
MCH	1.1	2.0	1.2	1.3
HVH	2.8	0.9	2.1	0.5
BSS	1.5	0.2		
BSHC	1.5	0.2	1.2	0.1
TOTAL	1.3	0.7	1.2	0.6

*BreastScreen South cumulative records excluded.

From the data provided, all lead providers appear to have met the target of less than 3 films repeated per 100 films for technical reasons. In general, the rates continue to be considerably lower than the target. BSAIMG Monitoring Report Number 2 suggested that entry of the values in the relevant fields of the national monitoring indicator set requires validation for a sample of records.

2.4 Assessment rate

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

Target – prevalence screen: target is < 10% and the expected target is < 7%
incidence screen: target is < 5% and the expected target is < 4%

Women with positive screening tests are referred for assessment. These women are clearly at higher risk of breast cancer than women with negative mammograms, and must be offered appropriate assessment. The number of women referred is determined by the underlying prevalence of breast cancer in the population and by the sensitivity and specificity of the screening test. A screening programme with high sensitivity will correctly identify most of the women with breast cancer (women with true positive mammograms), and they will be referred for assessment appropriately. The specificity of the screening programme contributes to the referral rate because women with false positive mammograms will also be referred. The lower the specificity of screening, the higher the number of women with false positive tests. Thus, it is important to maintain high specificity, in order to reduce the number of women with false positive tests and the associated unnecessary anxiety and the number of women requiring further investigation (see section 2.10). Also, referral to assessment would be high if symptomatic women were being screened in the programme. BreastScreen Aotearoa preferred policy is that women with symptoms should be referred to their primary care provider, with an appropriate letter, for clinical review even if they have negative mammograms, as a normal screen result alone cannot exclude breast cancer in the presence of symptoms.

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

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

Lead Provider	Quarterly assessment rate (%)	Cumulative assessment rate (%)
ABS	8.3	7.5
HWL	6.6	5.6
MCH	7.1	5.1
HVH	8.1	6.2
BSS	7.7	6.6
BSHC	8.2	8.1
TOTAL	7.7	6.6

From the data available, BreastScreen HealthCare, a pilot study area that is expected to be mainly carrying out incidence screens, had a rate of referral to assessment of 8.2% in this quarter, up from 7.3% in the previous quarter. This quarterly result and the cumulative result of 8.1% is of concern, considering this lead provider will be mainly screening women who have already been screened before, and taking into account the results for this lead provider for specificity and the false positive rate. This referral rate exceeds the minimum assessment rate target of less than 5% for incidence screens.

2.5 Assessment records of the national monitoring data set

As indicated in the previous report, not all women referred for assessment have complete assessment records in the national monitoring data set and, in particular, many records of the national monitoring data set do not have an outcome of assessment recorded. The number of these outstanding records severely limits monitoring of this vital aspect of the quality of the programme against the targets set. An additional month's screening and assessment records were routinely included in the data transferred for this report because women screened towards the end of June 2000 may not have completed the assessment process until the following month. Information on assessment for nearly all women screened in this quarter should therefore be included if timeliness indicators are met (see section 5.2 and 5.3).

It is the responsibility of BreastScreen Aotearoa to ensure that women with abnormal mammograms receive appropriate and timely follow-up. BSAIMG has identified some women who had abnormal mammograms, but there is no information about what happened to these women subsequently. Some of these women had their abnormal mammograms over a year ago. It is vital that we find out what has happened to all of these women. It is the lead providers responsibility to ensure that all women receive appropriate notification and offer of assessment investigation (and treatment if necessary). Women who have had abnormal mammograms may have breast cancer. In the worst case scenario, the lack of information for a women who has been referred for assessment, may mean that the woman never received her results or her assessment appointment. This would represent a failure of the national screening programme and would be unacceptable.

The requirements for monitoring the outcomes of women with incomplete assessment records in any quarter are currently being reviewed by the HFA.

A summary of the cumulative number of outstanding assessment results for women screened in the national programme to June 30, 2000, is shown in Table 2.5.1.

Table 2.5.1. The cumulative percentage and number (n) of assessment records where the outcome of assessment is not recorded in the national monitoring data set as at July 2000.

Lead provider	Percentage of referred women with assessment result not recorded as at July 2000 (n)	Percentage of women screened with assessment result not recorded as at July 2000	Number of women recorded as having exited lead provider assessment before result known
ABS	3.6 (97)	0.3	11
HWL	1.5 (15)	0.1	0
MCH	1.9 (16)	0.1	7
HVH	5.8 (45)	0.4	7
BSS	1.4 (24)	0.1	2
BSHC	6.8 (66)	0.6	2
TOTAL	3.3 (263)	0.4	29

The following table (Table 2.5.2) shows the number of months elapsed without a diagnosis following a referral to assessment for women screened in BreastScreen Aotearoa to 30 June 2000. Each lead provider is shown separately, and the total for BreastScreen Aotearoa is also provided.

Table 2.5.2 Number of months elapsed without a diagnosis following referral to assessment for women screened in BreastScreen Aotearoa to 30 June 2000:

Months	ABS	HWL	MCH	HVH	BSS	BSHC	Total
<1*	17	7	0	3	6	7	40
1*	9	2	5	3	3	4	26
2*	11	0	2	1	1	4	19
3	10	0	0	4	3	0	17
4	5	1	0	1	0	1	8
5	9	0	1	2	0	0	12
6	3	0	0	0	2	1	6
7	7	0	0	7	0	3	17
8	4	2	1	2	3	4	16
9	6	0	3	4	1	1	15
10	2	0	4	0	3	0	9
11	4	0	0	1	0	0	5
12	2	0	0	9	1	0	12
13	3	1	0	1	0	3	8
14	1	2	0	2	0	1	6
15	3	0	0	4	1	9	17
16	1	0	0	1	0	17	19
17	0	0	0	0	0	10	10
Total	97	15	16	45	24	65	262

* Women referred for assessment during April, May and June 2000, whose assessment records were outstanding. BSAIMG is routinely provided with a 1-month catch-up file for assessment data entered during July (to allow for delays in data entry). Thus women in the first three rows of the table are those whose assessment records remained incomplete one month after the end of the quarter.

The timeliness targets for assessment (Section 5, tables 5.2 to 5.4) are:

- 90% of women to be offered their first assessment appointment within 14 working days of their final mammogram,
- 90% to have biopsies (if required) within 7 days of assessment, and
- 90% to receive their assessment results within 7 days of their final diagnostic biopsy.

Failure to meet a target in the short term may occur if some women choose to delay their assessment appointments. There may be some women in this category for whom the assessment process takes longer than expected. However, for most women, the assessment process, including provision of a definitive diagnosis, should take less than a month from the time of screening.

Table 2.5.3 The number of women for whom more than 6 months has elapsed without a definitive diagnosis following referral to assessment. This number is also shown as a percentage of women referred for assessment by each lead provider (in parentheses).

ABS	HWL	MCH	HVH	BSS	BSHC	Total
36 (1.3)	5 (<1)	8 (1.0)	31 (4.0)	11 (<1)	49 (5.1)	140

Three lead providers have outstanding assessment records of duration six months or more, for more than 1% of women referred for assessment (Table 2.5.3). Of particular concern, BreastScreen Central has assessment records outstanding for six months or more for 4% of women referred for assessment and BreastScreen HealthCare has assessment records outstanding for six months or more for 5.1% of women referred for assessment. It is recommended that BreastScreen Central and BreastScreen HealthCare urgently remedy this.

The lack of a complete outcome of assessment records in the national monitoring data set is a major concern for BSAIMG. Women referred to assessment have a greater chance of having breast cancer than other women and the national monitoring data set of the programme currently is unable to record the outcome of assessment for many of these women. BSAIMG has provided to the HFA, for review of the case records, a list of NHI numbers (which we receive in encrypted form) of women referred for assessment but for whom no outcome of assessment has been recorded in the national monitoring data set. Although the HFA has obtained information from lead providers about most of these women, BSAIMG is still not reassured, because the required information is missing or inadequate for some women.

2.6 False positive rate

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

Target - prevalence round: target is < 9% and the expected target is < 6%
- incidence round: target is < 4% and the expected target is < 3%

Sufficient data was available to calculate the false positive rate for all lead providers in this quarterly report, compared to only four in the previous quarterly report. Overall, the programme's false positive rate was well within the target (Table 2.6).

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

Lead Provider	Quarterly false positive rate (per 100 women)	Cumulative false positive rate (per 100 women)
ABS	6.7	6.5
HWL	6.1	5.0
MCH	6.0	4.3
HVH	6.9	5.2
BSS	6.7	5.8
BSHC	6.7	7.0
TOTAL	6.6	5.7

From the data provided, all of the four lead providers who are predominantly conducting prevalent screening met the target for the false positive rate per 100 women screened.

BreastScreen HealthCare, which is predominantly conducting incident screening, again had a higher false positive rate for this quarter than the indicator. This lead provider continues to have a relatively high false positive rate, although there has been a slight improvement this quarter from 7.8% last quarter. In Monitoring Report number 3, BSAIMG recommended that BreastScreen HealthCare investigate the reasons for the relatively high referral to assessment rate and indicated that if this rate were reduced it would be likely to reduce the high false positive rate.

2.7 Open surgical biopsy rate

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

Target - < 1%

The open surgical biopsy rate is shown in Table 2.7. This parameter of performance was available for all six lead providers in this quarter.

Table 2.7. Rate of open surgical biopsy per 100 women screened and numbers of women by lead provider.

Lead Provider	Quarterly open surgical biopsy rate per 100 women screened (number of women)	Cumulative open surgical biopsy rate per 100 women screened (number of women)
ABS	0.4 (24)	0.3 (110)
HWL	0.1 (2)	0.2 (39)
MCH	0.2 (5)	0.3 (53)
HVH	0.2 (5)	0.2 (24)
BSS	0.1 (5)	0.2 (51)
BSHC	0.8 (15)	0.7 (80)
TOTAL	0.3 (56)	0.3 (357)

All six lead providers met this target. BreastScreen HealthCare appears to have a relatively high open biopsy rate in conjunction with a relatively low core needle biopsy rate (section 2.9). Where possible, it is preferable for a woman to have a core needle biopsy rather than an open biopsy to determine the final diagnosis, since this avoids the necessity for the woman to undergo a general anaesthetic.

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 number with benign open biopsy.

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

The percentage of open biopsies weighing less than 20 grams is shown in Table 2.8.

Table 2.8. Per cent of open biopsies weighing < 20gm per 100 women screened and numbers of women with open biopsies <20gm by lead provider.

Lead Provider	Quarterly percent of benign biopsies weighing less than 20gm (n)	Cumulative percent of benign biopsies weighing less than 20gm (n)
ABS	22.7 (5)	43.8 (39)
HWL*		
MCH*		
HVH**		33.3 (5)
BSS	66.7 (2)	38.9 (14)
BSHC	66.7 (6)	77.1 (47)
TOTAL	38.2 (13)	52.2 (105)

* BreastScreen Midland and BreastScreen Coast to Coast quarterly and cumulative figures excluded.

** BreastScreen Central quarterly figures excluded.

Cumulatively, none of the lead providers for whom we have a result recorded reached the target. BreastScreen Midland and BreastScreen Coast to Coast have had both quarterly and cumulative results excluded because it would appear that some weights may be misleading for some women, for example, BreastScreen Midland had 20 benign biopsy weights recorded as 099 grams and BreastScreen Coast to Coast had nine weights recorded as 001 grams.

It should be pointed out that results are based on small numbers in each quarter (13 benign surgical biopsies were performed this quarter), and thus it may be preferable to regard this as a target that is most appropriately measured yearly rather than quarterly. If high biopsy weights continue an audit of the procedure for these women should be conducted. In view of the somewhat low rate of open surgical biopsy, it is possible that open biopsy is being reserved for women with large abnormalities with greater biopsy specimen weight. However, BSAIMG have been informed that BreastScreen Midland, BreastScreen Coast to Coast, and BreastScreen Central did enter misleading biopsy weights for some women. This issue is being addressed by the HFA.

2.9 Needle biopsy rates

Definition

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

Target - None set

The needle biopsy rates for six lead providers are shown in Table 2.9.

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

Lead Provider	Quarterly			Cumulative		
	FNA % (n)	Core needle % (n)	Both†† % (n)	FNA % (n)	Core needle % (n)	Both†† % (n)
ABS	0.2 (13)	2.8 (174)	0.2 (9)	0.2 (87)	2.4 (867)	0.2 (69)
HWL	0.3 (10)	1.1 (41)	0 (0)	0.4 (65)	1.2 (212)	0.01 (2)
MCH	0 (0)	1.6 (36)	0 (0)	0.1 (10)	1.3 (217)	0 (0)
HVH	0.3 (7)	0.8 (18)	1.7 (36)	0.2 (28)	0.6 (78)	1.4 (169)
BSS	1.1 (69)	2.3 (138)	0.03 (2)	1.0 (252)	1.8 (463)	0.1 (13)
BSHC	0.5 (10)	1.2 (23)	0 (0)	0.6 (71)	0.8 (96)	0.03 (4)
TOTAL	0.5 (109)	1.9 (430)	0.2 (47)	0.4 (513)	1.6 (1933)	0.2 (257)

††Women who have both FNA and core needle procedures

BreastScreen Central continues to exhibit a different pattern in the use of biopsy procedures, with a greater preference for both core needle and FNA. This may reflect a desire for greater security in the final diagnosis for this lead provider. However, the use of the biopsy procedures needs to be reviewed by BreastScreen Central, as it may be that the number of investigations for each woman could be reduced.

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.

Target - > 93%

Specificity is a measure of the proportion of women without breast cancer who undergo further investigation after screening. If specificity is low, a higher number of women will have false positive tests requiring further investigation. Further investigation creates considerable anxiety for women and if too frequent can be expensive for the programme preventing resources being used in other areas of the programme.

The specificity of the programme for lead providers during this quarter and up to the end of 1999 is shown in Table 2.10.

Table 2.10. Specificity of the programme by lead provider.

Lead Provider	Quarterly specificity (%)	Cumulative specificity (%)
ABS	93.2	93.5
HWL	93.9	95.0
MCH	93.9	95.7
HVH	93.0	94.7
BSS	93.2	94.1
BSHC	93.2	92.9
TOTAL	93.4	94.2

Overall, the specificity of the programme as measured by these lead providers met the target set. BreastScreen HealthCare met the target for specificity for this quarter.

3. Early detection of breast cancer

3.1 Cancer detection rate

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

Target - prevalence round: target is ≥ 6 per 1000 women screened
 - incidence round: target is ≥ 3 per 1000 women screened

Quarterly and cumulative cancer detection rates are shown in Table 3.1. Cancer detection rates should refer to invasive breast cancer. DCIS is a heterogeneous condition with different subtypes associated with different biological behaviour⁽¹⁾ and should not be included in the cancer detection rate. Unfortunately the recording of cancer in field B18.07 includes DCIS and without additional treatment data can not be separated from invasive cancer by BSAIMG in the national monitoring data set. The field records the final biopsy result but this may differ from final diagnosis for some women. Some subjective judgement is involved in the interpretation of histological specimens and some variation in reporting of DCIS is likely to occur.

Interpretation of the cancer detection rates with respect to the targets depends on the women with cancers detected by screening being asymptomatic. BreastScreen Auckland and North, BreastScreen Coast to Coast, BreastScreen Central, BreastScreen South, and BreastScreen HealthCare met the quarterly target. Cumulative results for the four lead providers predominately screening women in their prevalent round, BreastScreen Auckland and North, BreastScreen Coast to Coast, BreastScreen Central, and BreastScreen South were close to the expected target. BreastScreen Midland recorded a relatively low cancer detection rate for this quarter.

BreastScreen HealthCare continues to meet the incident screening target for women detected with breast cancer during subsequent screening rounds.

Table 3.1. Cancer detection rate by lead provider per 1000 women screened and the number of women with cancer detected.

Lead Provider	Quarterly cancer detection rate (number with cancer detected)	Cumulative cancer detection rate (number with cancer detected)
ABS	9.4 (58)	8.1 (290)
HWL	3.1 (12)	5.5 (98)
MCH	7.3 (16)	6.7 (111)
HVH	8.7 (19)	6.2 (77)
BSS	8.2 (50)	6.6 (171)
BSHC	8.1 (16)	5.6 (67)
TOTAL†	7.6 (171)	6.8 (814)

The above cancer detection rate is determined by the underlying prevalence of breast cancer and DCIS in a region, together with the sensitivity of the test (the ability to correctly identify women with breast cancer and DCIS). It is important to maintain

high sensitivity so women with breast cancer are not missed. But specificity is also important. While a high level of suspicion in film reading may improve sensitivity, it may also result in high referral rates, and high numbers of false positive tests (and low specificity). For this reason, it is vital for each lead provider to take note of the referral to assessment, specificity, and false positive rate in addition to the cancer detection rate for their region. The best way to reduce false positive results is for radiologists to review their films. Inter- and intra-rater reliability should be calculated for all the radiologists who read screening films for the lead provider. In particular, positive films where the final outcome is known (after assessment) should be reviewed, so that radiologists can re-examine true positive and false positive films. It would be useful for this to be part of the routine quality assurance procedures carried out by each lead provider.

A summary of referral to assessment, specificity, the false positive rate and the cancer detection rate is recorded in Table 3.2 by lead provider for the quarter 1/4/00 to 30/06/00.

Table 3.2 Referral to assessment, specificity, false positive rate and cancer detection rate by lead provider for this quarter.

Lead provider	Referral to assessment per 100 women screened	Specificity (%)	False positive rate per 100 women screened	Cancer detection rate per 1000 women screened
ABS	8.3	93.2	6.7	9.4
HWL	6.6	93.9	6.1	3.1
MCH	7.1	93.9	6.0	7.3
HVH	8.1	93.0	6.9	8.7
BSS	7.7	93.2	6.7	8.2
BSHC	8.2	93.2	6.7	8.1
TOTAL	7.7	93.4	6.6	7.6

An increase in referral to assessment rate is often associated with an increase in the false positive rate and a reduction in specificity. This is evident in Table 3.2. It is of concern that the referral to assessment and false positive rates remain high for BreastScreen HealthCare. BreastScreen HealthCare is conducting mainly incidence screening, so will have baseline mammograms for most women. This normally results in increased specificity and a reduction in the referral to assessment and false positive rates. Examination of the referral to assessment protocol for this lead provider may reduce the referral to assessment and false positive rate and increase specificity. BreastScreen Midland serves a population comprising both women who have had previous mammography as part of the Waikato pilot programme and women in areas not previously part of an organised screening programme. Their results would be expected to lie somewhere between the targets for incidence and prevalence screening.

4. Summary of treatment

The treatment data has been collected by the HFA, but it is yet to be fully entered into the information systems of all lead providers. Therefore it has not yet been received by the monitoring group and this section has not been completed.

The HFA had previously advised that all treatment data up to December 31, 1999, was to be in the national monitoring data set by June 30, 2000. This data was expected to be transferred to BSAIMG by the end of July, 2000. The HFA then confirmed that a delay has occurred with provision of the treatment data and the transfer of data in the format of version 2.12 of the Data Management Manual would not occur until November 2000. In November 2000 the HFA advised that this will occur in February 2001. Until this is available the small cancer detection rate, which is an important parameter of the effectiveness of the programme, can not be reported. Also, cancer detection for invasive cancer and DCIS will not be able to be reported separately until then.

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.

Target - 95% notified within 10 working days.

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

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

Lead Provider	Quarterly % notified within 10 working days (number of women)	Cumulative % notified within 10 working days (number of women)
ABS	96.0 (5,923)	96.9 (34,731)
HWL	96.3 (3,706)	99.1 (17,821)
MCH	97.5 (2,134)	98.8 (16,287)
HVH	97.1 (2,113)	97.9 (12,133)
BSS	96.6 (5,926)	97.7 (25,187)
BSHC	33.3 (659)	65.6 (7,812)
TOTAL	90.9 (20,461)	94.6 (113,971)

Overall, the programme has not met this target for this quarter, however this average is affected by the poor performance of BreastScreen HealthCare. The other five lead providers have exceeded the target for this quarter. Overall, the programme is marginally below the 95% target.

All lead providers listed except BreastScreen HealthCare have met the target of 95% of women notified of their screening result within 10 working days of screening in this quarter and up to June 30, 2000. Also, BreastScreen HealthCare continues to fail to meet this target with successively only 46.7%, 39% and now 33.3% in the latest quarter notified within 10 working days.

Delays in notification of screening results may create anxiety in women, which could potentially reduce programme acceptability and rescreening rates. Monitoring Report Number 3 indicated that immediate action was needed by BreastScreen HealthCare to rectify delays. This continues to be required.

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.

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

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

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

Lead Provider	Quarterly % offered assessment within 14 working days (number of women)	Cumulative % offered assessment within 14 working days (number of women)
ABS	85.7 (438)	61.9 (1,673)
HWL	87.4 (222)	84.4 (843)
MCH	82.1 (128)	85.7 (718)
HVH	87.5 (154)	87.6 (678)
BSS	69.3 (327)	76.2 (1,272)
BSHC	19.0 (31)	29.8 (288)
TOTAL	70.6 (1300)	68.8 (5,492)

None of the lead providers have reached the target of 90% of women offered an assessment appointment within 14 working days of their final screening mammogram. If the entry of the date of offer of an assessment appointment is restricted by software validation rules for some lead providers then this should be remedied so that the correct date exists in the national monitoring data set.

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.

Target

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

Quarterly and cumulative results are shown in Table 5.3 for all lead providers.

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

Lead Provider	Quarterly		Cumulative	
	Percentage for which needle biopsy completed within 7 days of assessment (n)	Percentage for which open biopsy offered within 3 weeks of assessment (n)	Percentage for which needle biopsy completed within 7 days of assessment (n)	Percentage for which open biopsy offered within 3 weeks of assessment (n)
ABS	100 (196)	54.2 (13)	100 (1,023)	53.6 (59)
HWL	68.6 (35)	0 (0)	78.1 (218)	18.0 (7)
MCH	100 (36)	20.0 (1)	94.3 (214)	30.2 (16)
HVH	88.5 (54)	80.0 (4)	94.9 (261)	62.5 (15)
BSS	88.0 (183)	40.0 (2)	87.1 (633)	62.8 (32)
BSHC	100 (33)	100 (15)	96.5 (165)	88.8 (71)
TOTAL	91.8 (537)	62.5 (35)	93.0 (2,514)	56.0 (200)

Delays in receiving needle biopsy were commonest for women of BreastScreen Midland and BreastScreen South in this quarter. For BreastScreen Auckland and North the percentage of women requiring a needle biopsy procedure who had it completed within seven working days was 100%; the same as the previous quarter. Validation for this data entry measure is required. The number of open biopsies in the quarter was too small for meaningful quarterly comparison with the target.

All lead providers recorded delays beyond the target in offering women an open biopsy procedure within three weeks of their assessment. BreastScreen Midland and BreastScreen Coast to Coast were significantly below the target in cumulative totals, which is of concern. It was recommended in Monitoring Reports 3 and 4 that the organisation and availability of these diagnostic services needed to be investigated by all lead providers and improved immediately. If however the software validations rules have prevented the entry of correct dates in the national monitoring data set then this needs to be remedied.

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.

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

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

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

Lead Provider	Quarterly % results within 7 days (number of women)	Cumulative % results within 7 days (number of women)
ABS	62.5 (125)	73.3 (1,124)
HWL	88.2 (45)	57.5 (165)
MCH	91.9 (34)	82.6 (219)
HVH	95.2 (59)	86.3 (239)
BSS	54.8 (114)	51.1 (380)
BSHC	76.7 (33)	57.6 (132)
TOTAL	67.2 (410)	67.7 (2,259)

From the national monitoring data set, up to the end of June 2000, two of the six lead providers have now been able to meet the target (compared with no lead providers in the last quarter). Overall however, the programme was performing well below the target set. BSAIMG have been advised that computer software validation rules for data entry of the relevant fields may have been a problem.

These results suggest that assessment services and reporting processes of many lead providers may not be sufficiently organised to meet the targets, but that improvements have been made. It was recommended in Monitoring Report Number 3 that the administration of this reporting process needed to be reviewed and improvements made. This continues to be required, for those lead providers who have failed to reach the target.

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.

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

As treatment data is not yet recorded as part of the national monitoring data set this target cannot be measured. Table 5.5 has been left blank.

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

Lead Provider	Quarterly % women offered primary treatment within 3 weeks	Cumulative % women offered primary treatment within 3 weeks
ABS		
HWL		
MCH		
HVH		
BSS		
BSHC		
TOTAL		

References

Ministry of Health (1996). Interim National Quality Standards New Zealand Breast Cancer Screening Programme.

Appendix A

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

The reports will assess the data of BreastScreen Aotearoa, and of individual providers, with respect to the National Monitoring Indicator Set (NMIS). The reports will also indicate when revision of the NMIS is required, and the HFA 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 HFA will also be included when action is required to improve or maintain the performance of BreastScreen Aotearoa.

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

A2.0 KEY PARAMETERS

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

A2.1 IDENTIFICATION AND INVITATION

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

A2.1.1 Registration rate *

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

A2.1.2 Coverage rate *

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

A2.2 SCREENING TEST

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

A2.2.1 Radiation dose/Optical density

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

A2.2.2 Number of films taken *

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

A2.2.3 Technical recall rate *

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

A2.2.4 Technical repeat rate *

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

A2.2.5 Sensitivity (estimate)

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

A2.2.6 Specificity (actual)

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

A2.2.7 Specificity (approximate)*

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

A2.2.8 Positive predictive value (PPV)

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

A2.3 ASSESSMENT

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

A2.3.1 Assessment rate *

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

A2.3.2 False positive rate of mammograms *

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

A2.3.3 Needle biopsy rate *

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

A2.3.4 Benign biopsy weight

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

A2.3.5 Open surgical biopsy rate *

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

A2.3.6 Benign biopsy rate *

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

A2.4 DIAGNOSIS

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

A2.4.1 Pre-operative diagnosis rate

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

A2.4.2 Cancer detection rate *

The cancer detection rate will be calculated by dividing the number of women with breast cancer diagnosed through the screening programme by the number of women screened. This information will be obtained from provider records. The cancer detection rate and 95% confidence interval will be calculated by age group, and by region and provider. The targets are <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 quarterly.

A2.5.1 Time to recall after a negative screen

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

A2.5.2 Time taken to provide results of screening *

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

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

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

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

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

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

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

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

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

A3.0 QUARTERLY REPORT PROCESS

- A3.1** BSAIMG receives cleaned data in agreed format from NZHIS within one month of quarter end.
- A3.2** BSAIMG drafts quarterly report as agreed proforma within two months of quarter end.
- A3.3** BSAIMG discusses the draft with lead providers (own report) before it is finalised.
- A3.4** HFA and lead providers' review draft reports and feedback within one month of receiving reports.
- A3.5** BSAIMG assesses feedback and finalises its report.
- A3.6** BSAIMG electronically transfers final quarterly report to the HFA within two weeks of receiving feedback. If a serious issue becomes apparent it will be discussed with the HFA prior to this transfer.
- A3.7** HFA circulates reports to each lead provider (own report).
- A3.8** BSAIMG forwards a copy of the report directly to the HFA 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 HFA.
- A4.6** BSAIMG will utilise projected population figures for calculation of the registration rate and population coverage.
- A4.7** Quarterly and annual reports will include women screened and assessed in that quarter who have a screening and final diagnosis recorded. Reports may include details of a previous screening quarter’s assessment data – if this occurs it will state which screening quarter the assessment data relates to.
- A4.8** Round reports will include all women screened and assessed in a defined 24-month period.

Appendix B

Population Projections BreastScreen Aotearoa (1999/2000)

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 1999 and 2000.

Table 1. Population projections BreastScreen Aotearoa (1999/2000).

Population Projections BreastScreen Aotearoa (1999/2000)	
BreastScreen Auckland & North	95,855
BreastScreen Midland	45,085
BreastScreen Coast to Coast	38,627
BreastScreen Central	30,901
BreastScreen South	50,524
BreastScreen HealthCare	21,155
Total	282,147
70% coverage over two years	197,502
Number screened per annum at 70% coverage	98,751

Table 2. Population projections (1999/2000) by age group.

Population Projections (1999/2000) Summary by age group				
	50-54	55-59	60-64	Total
BreastScreen Auckland	40773	30922	24160	95855
BreastScreen Midland	17881	14641	12563	45085
BreastScreen Coast to Coast	15575	12328	10724	38627
BreastScreen Central	13171	9860	7870	30901
BreastScreen South	21031	15976	13517	50524
BreastScreen HealthCare	8675	6690	5790	21155
Total	117,106	90,417	74,624	282,147

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 (1999/2000) by ethnicity.

Population Projections (1999/2000)				
Summary by ethnicity				
	Maori	Pacific	Other	Total
BreastScreen Auckland	8,190	6,045	82,290	96,525
BreastScreen Midland	6,515	433	38,355	45,303
BreastScreen Coast to Coast	4,815	293	33,308	38,416
BreastScreen Central	2,143	1,333	27,855	31,331
BreastScreen South	1,865	325	48,340	50,530
BreastScreen HealthCare	868	108	20,380	21,356
Total	24,396	8,537	250,528	283,461

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.

Appendix C

The Place of Extended Assessment In the National Breast Screening Programme

Background

“Extended assessment” (otherwise termed periodic mammographic follow-up or short-term recall) has been proposed as a method of managing abnormalities identified on routine screening mammography. It is advocated by some radiologists as a suitable method for managing abnormalities that are not considered unequivocally benign but do not appear to warrant the performance of a biopsy. It was first advocated by the prominent Californian Radiologist Ed Sickles in a landmark paper in *Radiology* in 1991 [1]. Another paper by Ximena Varas in 1992 [2] supported his approach.

It is worth noting that Dr Sickles’ paper covered the period 1978 – 1987 and Dr Varas’ paper covered the period 1987 – 1989. This was prior to the introduction of accurate stereotactic and ultrasound guided core needle biopsy for mammographic lesions. Part of the motivation for their approach was to avoid the cost and morbidity associated with hookwire localisation biopsies if these were not strictly necessary. Both of these series included symptomatic patients as well as those who had lesions discovered on screening mammography. Both included women under age 50.

The only paper I have found relating to the use of extended assessment in a formally organised breast screening programme is that of J.S. Dawson and A.R.M. Wilson in *Clinical Radiology* in 1994 [3]. This paper included 131 patients from the British NHSBSP.

Advantages of Extended Assessment

Proponents of this approach point to Dr Sickles’ overall figures of 17 cancers found among 3,184 probably benign lesions for a positive predictive value (PPV) of 0.5%. His positive predictive value for well-defined solid nodules was 2%. Dr Varas had a similar positive predictive value amongst 558 patients of 1.7%. Drs Dawson and Wilson had an overall positive predictive value amongst 128 women of 3.9%. On this basis, proponents argue that this is a safe method for reassuring woman that the abnormality found in their breast is benign.

Disadvantages and Controversies in Extended Assessment

Close examination reveals numerous problems in applying the results of the above three studies to a National Breast Screening Programme.

1. Of 28,458 mammograms that Dr Sickles read, he identified 3,184 lesions that were subjected to extended assessment. This is 11.2% of the population - far higher than is considered acceptable in the Breast Screening Programme even for recall to assessment, let alone for extended assessment over a period of 3 – 3.5 years. A worst case analysis would be that, had Dr Sickles used extended assessment in only 1%, the cancer rate (PPV) among this group could have been as high as 5.5%.
2. Dr Sickles himself in his article and in presentations since that time has emphasised that his figures applied only to the conditions under which he was operating. These

conditions are not in any way similar to those under which Breast Screen Aotearoa operates.

3. The patient population in the first two studies was different from that in the New Zealand Breast Screening Programme. In fact, Varas' study showed a risk of cancer in those with microcalcifications aged over 50 of 6.2%. This would clearly be unacceptable.
4. The overall positive predictive value of 3.9% in the only study from a breast screening programme makes this approach hard to justify when the role of assessment in the screening programme should be to provide a high degree of assurance to woman that their lesion is either benign or malignant. Furthermore, in this same study, the rate of cancer in areas of parenchymal deformity/stellate density was 15%. This is clearly totally unacceptable.
5. There is no universal agreement on what constitutes a probably benign lesion. The three studies quoted above do not have the same criteria for this. A more recent study by Berg [4] looking at interobserver variability for radiologists using the American BI-RADS lexicon for describing mammograms showed high rates of inter and intraobserver variability. In practical terms, this means that it is unlikely that radiologists would reliably assign lesions to this method of assessment in a uniform manner across different sites or even within the same site, even for the same radiologist on different occasions.
6. Anecdotal unpublished evidence from within New Zealand (Middlemore mammography audit) and from the British NHSBSP (Richard Sainsbury, Oral Communication 1999) indicates a high rate of misapplication of extended assessment with an unacceptable rate of cancers within this group. This applies both within the NHSBSP and in informal screening within New Zealand. It is a serious concern that transfer of the same standards for using extended assessment from New Zealand private practice into the screening programme will lead to unacceptably high numbers of cancers being included in this group.
7. Both the NHSBSP and the New Zealand programme have attempted to limit the use of extended assessment to <1%. However, use in the NHSBSP has "crept" so that, in 1998, use was over 1% in 48% of units and over 2% in 24% of units [5]. If allowed to continue, it is likely that this creep will occur in New Zealand also.
8. A woman undergoing assessment in the screening programme should emerge from it with a positive and negative predictive value for cancer of close to 100%. Rates of 99-100% negative and around 99% positive PV are achievable with properly performed image guided biopsy techniques. Dawson achieved only 96.1% negative predictive value using extended assessment in the NHSBSP and I do not think this is acceptable.
9. There is, at present, no useful data to suggest that the New Zealand screening programme performs even up to the level of the NHSBSP for extended assessment, let alone at a level that would be acceptable in the current environment surrounding screening programmes.

Summary and Recommendation

Although “extended assessment” has been used successfully by some individuals for the management of certain types of lesions, it was developed primarily to deal with the cost and morbidity of hookwire localisation biopsy. That method of biopsy has subsequently been supplanted by the much less costly and much less invasive techniques of stereotactic and ultrasound guided core biopsy (and, in some hands, fine needle aspiration cytology). The studies that support extended assessment mostly do not apply to mass screening programmes of the type operating in New Zealand. The single study drawn from the NHSBSP demonstrates considerable risk attached to this procedure. Subsequent publications from the NHSBSP show concern amongst the breast screening community about the levels of early recall performed in the NHSBSP and the possibility of adverse psychological consequences.

There is, therefore, no good evidence to support the use of extended assessment. There is clearly some very real risk associated with it. This particularly relates to the possibility of cancers being included in this group and erroneously followed or, even worse, having the woman in question drop out of extended assessment and therefore present with an interval cancer at a later stage. Extended assessment therefore should not be used in the screening programme. If a lesion cannot be demonstrated by mammography and ultrasound to have a sufficiently low probability of malignancy that it can be safely left until the next two yearly screen, it should be subjected to tissue diagnosis by a reliable and proven method.

References

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