

BreastScreen Aotearoa Programme Monitoring Report

For Māori, Pacific and Total women screened
during the two or four years to June 2016

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Prepared for the National Screening Unit, Ministry of Health by
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INTRODUCTION

This report summarises the performance of BreastScreen Aotearoa (BSA) based on quality indicators for women screened during the two- year period to June 2016. Treatment indicators are for women screened during the four-year period to June 2015.

Breast cancer is the most commonly diagnosed cancer among women in Aotearoa New Zealand. Screening aims to detect cancers at an early stage when tumours are more amenable to treatment. A properly organised breast screening programme can significantly reduce illness and death from breast cancer¹.

BSA offers free two-yearly mammographic screening to women aged 45 to 69 years. It plays a vital role, firstly by finding breast cancer tumours at a very early and treatable stage; and secondly by systematic follow-up of women whose cancer is found by the screening programme to ensure timely pathways through the cancer care continuum. Women screened by BSA have a third lower risk of dying from breast cancer than women who are not screened².

BreastScreen Aotearoa has eight Lead Provider (LP) regions. Each LP is responsible for providing or subcontracting mammography screening and assessment services in their region. Independent Service Providers are contracted by the National Screening Unit (NSU) to support women from priority groups to screening and assessment. District Health Boards (DHBs) provide breast cancer treatment after diagnosis. Surgery is performed by DHB services and private providers; oncology and radiation therapy are provided by the six Cancer Centres (or by private providers in some areas). Data on the treatment provided to women whose breast cancer was detected by BSA is collected by each LP and reported to the NSU.

Māori and Pacific mortality rates from breast cancer are disproportionately higher than those of other women³ and more equitable outcomes could be achieved if more Māori and Pacific women were diagnosed at an earlier stage. For this reason, BSA prioritises screening these women, and those who are unscreened or under-screened. All quality indicators are monitored and reported by ethnicity.

Tables and graphs for each quality indicator can be found in an online data tool on the [NSU's website](#). Previous monitoring reports and details of the indicator measures are also available.

This report summarises the results of BSA quality indicators related to coverage, screening quality and assessment, early detection, timeliness, and breast cancer treatment.

The report has four sections:

- Overall programme performance
- Lead Provider variability
- Equity issues
- Is BSA making a difference?

Recommendations from the BSA Advisory Group and the Māori Monitoring and Equity Group are appended.

¹ National Screening Unit. 2003. *Strategic Plan 2003–2008*. Auckland: Ministry of Health.

² Ministry of Health. Summary of the BreastScreen Aotearoa Mortality evaluation 1999–2011. Wellington: Ministry of Health.

³ Ministry of Health. 2016. Cancer: New registrations and deaths 2013. Wellington: Ministry of Health.

OVERALL PROGRAMME PERFORMANCE

This section examines the performance of the BSA programme at the national level. Quality indicators by Lead Provider may differ from those of the overall programme. The report focuses mainly on the findings for women aged 50 to 69 years, since targets have only been developed for this age group. Any key differences in quality indicators for women aged 45 to 49 years are summarised at the end of this section. The online data tool includes tables and graphs of trends over time for all indicators for both age groups by ethnicity.

Coverage – on target for Pacific and total women but not for Māori

- Coverage was on target for Pacific and total women but not for Māori. BSA screened 65% of Māori women, 73% of Pacific women, and 72% of other women aged 50 to 69 years (target over 70%).
- An additional 3,063 Māori women aged 50 to 69 years needed to be screened to reach the target.
- Among women aged 45 to 49 years, BSA screened 63% of Māori, 70% of Pacific and 73% of other women.

BSA screened over half a million women (515,334) during the two year period to 30 June 2016, 9,400 more than during the biennium to 30 June 2015 and nearly double the number screened by BSA 10 years ago (around 270,000 in 2006–07)⁴.

The coverage target of more than 70% for women aged 50–69 years was met for BSA overall, with 71% of eligible women screened between July 2014 to June 2016. The proportion of eligible women aged 45–49 years was also 71%. However, despite more women being screened, these proportions were 1% lower than was achieved for the previous biennium since the eligible populations have increased in size.

Māori screening participation remained below the target at 65% for women aged 50–69 and at 63% for women aged 45–49 years. These rates have not changed since the previous two-year period. The actual number of Māori women screened increased by 2,400 during this period (aged 45–69 years). To achieve the 70% target for women aged 50–69 years, just over 3,000 additional Māori women needed to be screened. As noted previously, significant acceleration is required to reach the 70% target for Māori. Such progress has been made by different LPs during various periods in the past.

National coverage of women aged 50–69 years was highest for Pacific women at 73%. Among Pacific women aged 45–49 years, 70% participated in breast screening with BSA (2% lower than during the two years to June 2015). High coverage in the three northern LPs with high proportions of Pacific women continued to drive these national rates. In other LPs participation was below target and lower than that of non-Māori non-Pacific women. To achieve 70% coverage of Pacific women aged 50–69 years in all LP regions, a further 316 needed to be screened in total.

Timely rescreening – lower after initial screens, declining trends and widening disparities

- Timely rescreen targets were not met for Māori or Pacific women, with no improvement for

⁴ Page A, Arnett K, Taylor R. (no date). BreastScreen Aotearoa Independent Monitoring Report: Screening and Assessment Report of Women Attending BSA (women screen January 2006 to December 2007). School of Population Health, University of Queensland.

Māori and a slight worsening for Pacific women.

- Timely rescreening after an initial screen was below the target of 75% for all women with large gaps between Māori (57%), Pacific (49%) and other women (68%). The downward trend has slowed for Māori and non-Māori but continued to decline for Pacific women.
- Timely rescreening after a subsequent screen remained above the 85% target for non-Māori women (87%) but below target for Māori (81%) and declined for Pacific women (77%).
- Women aged 45–49 were more likely to be rescreened within 27 months of an initial screen than women aged 50–69 years.

Women who screen regularly have a lower risk of dying from breast cancer than those who screen less regularly⁵. If there is too long an interval between screens, new cancers have a longer time to develop beyond the early stages and screening is less effective at preventing illness and death. BSA aims to have 75% of women rescreened between 20 and 27 months of their initial screen and 85% rescreened within 20 and 27 months of any subsequent screen.

Previous reports noted a decline in the proportion of women being rescreened within 27 months of their first screen with BSA. This downward trend appears to have slowed for Māori and non-Māori women but continued to decline for Pacific women. Among women aged 50–67 years who were first screened during the two years to June 2014, the target was not met for any group and there were significant gaps between ethnic groups: 49% of Pacific women were rescreened within the desired timeframe compared to 57% of Māori women, and 68% of other women. Timely rescreening rates after an initial screen were at least 10 percentage points higher among women aged 45–49 years: Māori 68%, Pacific 63%, non-Māori non-Pacific 79%.

Rates of timely rescreening after subsequent screens were higher for all groups. The 85% target was exceeded for non-Māori non-Pacific women aged 50–67 years (87%) but below target for Māori women (81%). The proportion of Pacific women rescreened within 20–27 months of a subsequent screen dropped two percentage points since the previous biennium (from 79% to 77%). The results for women aged 45–49 years were similar to these.

If the targets of 75% (initial) and 85% (subsequent) had been met for all groups of women aged 50–67 years, BSA would have rescreened within 20–27 months approximately 1,700 more Māori women (490 after an initial and 1,214 after a subsequent screen); over 1,400 additional Pacific women (361 initial and 1,074 subsequent) and just over 1,600 non-Māori non-Pacific women (in the initial screens group only). Two LPs (BreastScreen Coast to Coast and BreastScreen Central) showed improvements in timely rescreen rates for all groups after a subsequent screen. It may be useful to share their strategies with other LPs. As noted in the previous report, potential issues for exploration include:

- Evaluating the impact of LPs now being able to access real-time reports on timely rescreening rates (not available prior to June 2016)
- Are all LPs implementing evidence-based activities known to support timely rescreening? Are there core activities that all LPs could undertake, with additional activities tailored to the local context?
- Have access enablers been identified and strategies employed to address them? Potential strategies could include hours of operation, screening unit location, mobile scheduling, ensuring women have good information about different screening locations and how to request changes for their screening appointment times or location and when to expect an invitation to return.

⁵ Ministry of Health. 2015. Summary of the BreastScreen Aotearoa Mortality Evaluation 1999 to 2011. Wellington: Ministry of Health.

- More quantitative and qualitative information about and from women who are not rescreened within 20–27 months, especially after initial screens.

Screening quality – technical recall rates and image quality on track but greater numbers having more than four images

- Technical recall rates in mobile units continued to decrease and were on target ($\leq 0.5\%$) for all LPs.
- The proportions of women having no more than 4 images per screening episode remained below target for Māori and Pacific women and were lower in mobile units than in fixed sites. One in four Māori and Pacific women screened in mobile units had more than 4 images per screening episode (target is less than one in five).
- The rate of rejected images (1%) remains well within the target ranges ($< 3\%$).

Since the move to digital technology in mobile units there has been a steep decline in the number of women recalled for technical reasons. The target of less than 0.5% was achieved and maintained in fixed and mobile units.

The proportion of women having no more than four images has continued to reduce in this reporting period. The proportions are around 2% lower in mobile units than in fixed sites overall but the differences between mobile and fixed units were greater for Māori (4% lower) and Pacific women (5% lower). Nationally, 74% of Māori and Pacific women screened in mobile units had no more than four images per screening episode, although Waitemata Northland met the target of over 80% for both groups of women and the target was within the confidence interval for several other LPs. The target was met for non-Māori non-Pacific women screened in mobile units by all LPs apart from BreastScreen Coast to Coast which did not meet the target for any group.

Only 1% of images were rejected (target $< 3\%$).

Timely reporting of screening results – improved and on target overall

- Most women received their screening results within 10 working days (94%) with significant improvement during the second half of this two-year period.

The decline in timely provision of screening results that started in 2013 when digital screening became widespread has now reversed with two large LPs (BreastScreen Midlands and BreastScreen South Ltd) showing significant improvement in the second 12 months of this reporting biennium. The target of 90% or more is now being met for all groups of women at the national level.

Assessment – quality on track, timeliness improving

- Targets for assessment quality indicators continued to be met for all groups of women having a subsequent screen.
- Among women having a subsequent screen, Māori women had similar rates of referral to assessment as non-Māori women but were around a third more likely to have a cancer detected from the assessment.
- Māori women having an initial screen were more likely than non-Māori to be referred to assessment. The positive predictive values (proportions of assessments from which a breast cancer was detected, ppv) were within the target range of 9% or more for both (14% for Māori, 12% for non-Māori).
- Pacific women had the highest positive predictive value for initial screens at 23%, twice as high as for non-Māori non-Pacific women.

- There was some improvement in the proportion of women offered their first assessment appointment within 15 working days but the trends varied between LPs and the target of 90% has yet to be met.

The proportion of women referred for further assessment after a subsequent screen remains steady and within the expected range of less than 5% for all women. All assessment quality indicators were within the target range for subsequent screens overall. This indicates that BSA is performing well for women who are returning for routine rescreening (the majority of women screened). Māori and non-Māori women had similar assessment rates from subsequent screens but Māori were more likely to have a cancer detected (23% compared to 17% for non-Māori).

For women having an initial screen the rates of referral to assessment and false positives were within the target ranges for the overall population but were outside the target values for Māori women. This varied by LP. However, the ppv was within the target value for all groups, and was highest for Pacific women. Nearly one in four Pacific women, one in seven Māori, and one in eight other women referred for an assessment from an initial screen had a cancer detected.

To expedite diagnosis and minimise anxiety, BSA aims to have 90% of women offered their first assessment appointment within three weeks of their screening mammogram. At 78% overall (83% for Māori and 85% for Pacific women) this indicator did not meet the target of 90% or more, but was trending up. However the trends varied between LPs with some achieving the target and one (BreastScreen Otago Southland) showing a particularly low rate. Continued attention to system and capacity issues may be needed to ensure the target is met for women in each region.

Biopsies – most diagnosed without open surgery and on time, open biopsies less timely and benign biopsy weight below target

- Most women (around 95%) had a definitive diagnosis of breast cancer without open surgery and within 5 working days of their assessment.
- Some women required open surgery to obtain a definitive diagnosis and 80% were benign. Of these women, just over one in five had a benign biopsy heavier than 30g (target is one in 10).
- Under two-thirds had their open biopsy within 20 working days (target 90%).
- The proportion of women who received their final diagnostic biopsy results within 5 working days remained at 84% overall (target 90%), but was lower for Pacific women (78%).

Around 95% of women diagnosed with breast cancer had a definitive diagnosis from a needle biopsy, meeting the target value for all groups of women. Most percutaneous biopsies (95%) were received within 5 working days of assessment, although one LP (BreastScreen Auckland Ltd) remained under target.

The benign open biopsy rates were within the target ranges for initial and subsequent screens. Among the women who had an open biopsy that turned out to be benign, just over four out of five had a biopsy weighing less than 30 grams. This was lower than the target value of 90%.

The proportion of women who received their open biopsy within 20 working days of being notified that they needed it remained unchanged at 57% (target 90%). Theatre capacity and prioritisation processes could be reviewed to assess their impact on this indicator.

The proportion of women who received their final diagnostic biopsy results within five working days remained at 84% overall, but was lower for Pacific women (78%). Time trends varied by region and some LPs met the 90% target. LPs trending down or not showing improvement could consider working with the pathology laboratories to look at process and system changes that may be required. This indicator aims to minimise anxiety and delays in treatment planning.

Early detection – on target for all indicators for Māori, Pacific and other women

- The programme is succeeding in its goal of early breast cancer detection.
- Māori women were more likely to have an invasive breast cancer detected than non-Māori women (significant only for subsequent screens).
- Pacific women had a higher rate of invasive cancer detection from an initial screen than non-Māori non-Pacific women but the detection rate from a subsequent screen was similar.
- The targets for detection of invasive cancers that are small ($\leq 15\text{mm}$) were met for all groups.
- The targets for detection of invasive cancers that have no nodal involvement were met for all groups having subsequent screens. For women having an initial screen, the proportion was lower for Māori and Pacific women but the target was within the confidence interval.
- The proportion of cancers that were not invasive (DCIS) was in the target range for all groups.

The invasive cancer detection rates were in the target range for initial and subsequent screens for each group of women.

Around half of breast cancers detected by BSA from initial screens were 15mm or less in diameter, as were two-thirds of those detected from subsequent screens. The rate of detection of small breast cancers per 10,000 screens was just over a fifth higher for Māori than for non-Māori women, but the difference was only statistically significant for subsequent screens.

The majority of invasive cancers detected by BSA from a subsequent screen had not spread beyond the breast to the lymph nodes, meeting the target value of $>75\%$ for each group of women (76% for Māori and Pacific women, 80% for other women).

For women whose cancer was detected from an initial screen, just over half of Māori (57%) and Pacific (56%) women had no nodal involvement but the target of $>70\%$ was within the confidence intervals. The target for other women was met (79%).

The proportion of breast cancers that were DCIS was within the target range of 10% to 25% for all groups of women, and was lower for Māori than for non-Māori women aged 50–69 years (17% compared to 24%).

Treatment – time to surgery under target and not equitable, other indicators met targets and had no ethnic differences

- The proportion of women who had their first surgical treatment within 20 days of receiving their final diagnosis was below target in all regions. Māori and Pacific women were less likely than other women to receive timely surgery overall but this varied by region.
- Among women whose invasive cancer was detected by BSA during the four years to June 2015, and whose cancer was $\leq 30\text{mm}$, 77% had sentinel node biopsy as their first axillary procedure. There were no significant differences between ethnic groups. This is a new indicator with no target.
- The proportions of Pacific and non-Māori women who had radiation therapy with breast conserving surgery for invasive cancer were outside the target range of 95% or more.
- The targets were met for all other treatment indicators, with no differences between Māori, Pacific, and other women.

The proportion of women who had their first surgical treatment within 20 working days was below target for all ethnic groups and in each LP region. Māori and Pacific women were less likely than other women to receive timely surgery.

A new indicator has been introduced that measures the proportion of women with invasive breast cancers 30mm or less who have sentinel node biopsy as their first axillary procedure. This indicator shows an increasing trend. For women whose cancer was detected during the four years to June 2015 three quarters of women (77%) had sentinel node biopsy as their first axillary procedure. There is no target for this indicator.

The proportions of Pacific (85%) and non-Māori non-Pacific women (93%) who had radiation therapy with breast conserving surgery for invasive cancer were below the target value of 95% or more. BreastScreen Auckland Ltd had the lowest proportion at 77%. In all other LP regions the proportions were over 90%.

All other treatment indicators met the target values.

There were no significant differences between Māori, Pacific and other women in the proportions receiving chemotherapy or endocrine therapy.

Women aged 45–49 years

- The majority of invasive breast cancers detected by BSA among women aged 45–49 years were small and had not spread to the lymph nodes.
- The rate of cancers detected per 1000 screens was about half the rate for women aged 50–69 years.

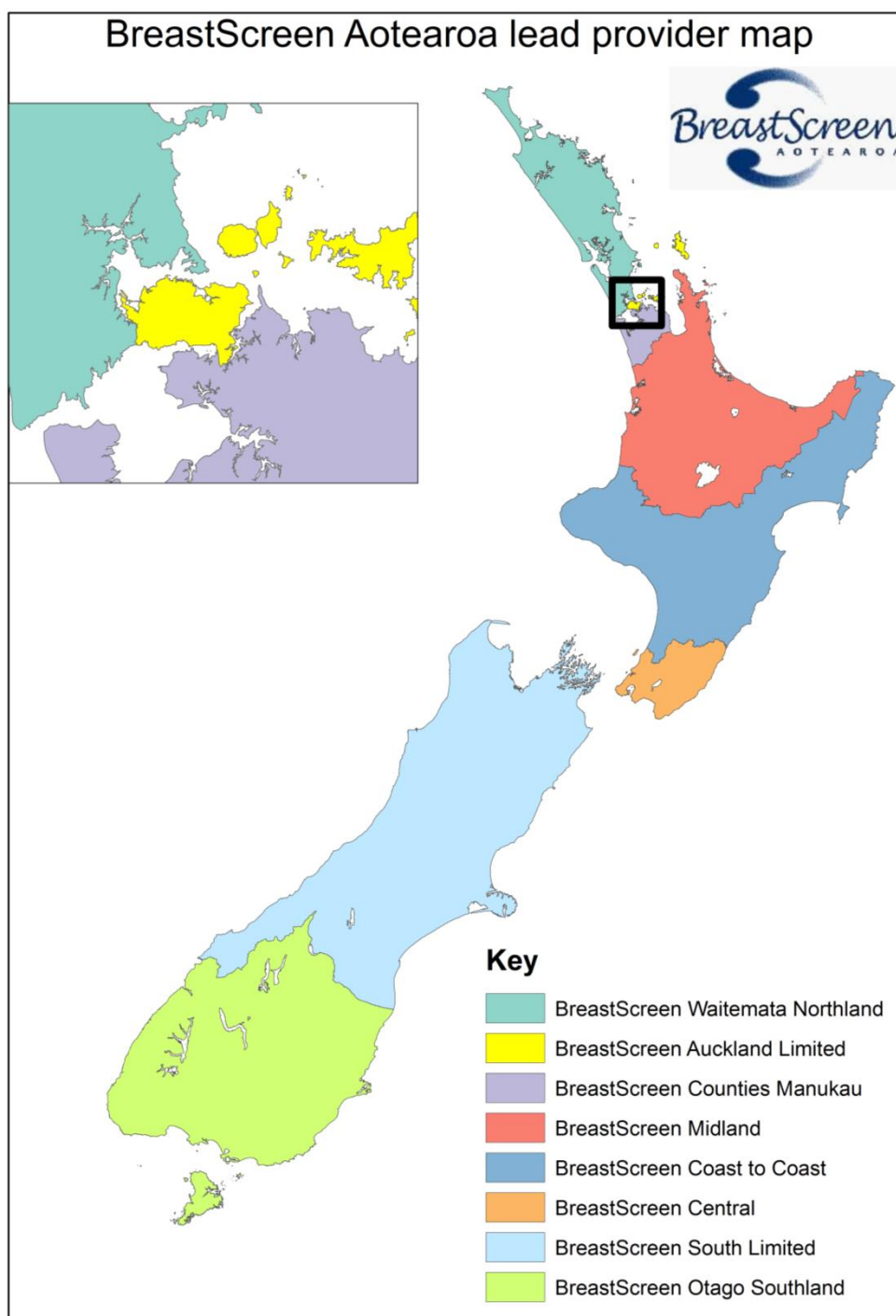
BSA has provided screening to women aged 45–49 years since 2004. Quality targets have not yet been set for this age group but are expected to be developed in the near future.

More than half of the invasive cancers detected among women aged 45–49 years were small (15mm or less in diameter) and around two-thirds had not spread to the lymph nodes. This indicates that the majority of women in this age group whose cancer was detected by BSA had a favourable prognosis. The main difference in the effectiveness of screening for younger women is that the rate of invasive cancers and small cancers detected per thousand women screened is lower – about half that for women aged 50–69 years who have a higher underlying risk of developing breast cancer. In addition, women in the younger age group who are referred for further assessment after their screening mammogram are half as likely to have a cancer detected as women in the older age group.

Other indicators that showed a significant difference between women in the two age groups remained similar to those previously reported. Compared to women aged 50–69 years, women aged 45–49 years had a:

- Lower coverage among Māori and Pacific women (but similar coverage among other women)
- Higher rate of timely rescreening after an initial screen and slightly lower rate after a subsequent screen
- Higher technical recall rate from fixed and mobile units
- Lower rate of referrals to assessment from initial screens
- Higher rate of referrals to assessment and higher false positive rate for subsequent screens
- Lower positive predictive value for initial and subsequent screens – around half as likely to have a cancer detected from assessment, and slightly lower specificity for both
- Slightly higher benign open biopsy rate (significant for initial, not for subsequent screens)
- Higher proportion of cancers detected that were DCIS
- Higher receipt of chemotherapy among women in two diagnostic groups.

LEAD PROVIDER VARIATION



The eight BSA Lead Provider regions are shown in the figure above. BreastScreen Health Care was replaced with BreastScreen Otago Southland in August 2014. The treatment indicators in this report cover a four-year period when BreastScreen Health Care was still operating, as do the time trends for all indicators.

Coverage – LPs varied in coverage and equity

- For Māori women aged 50–69 years, only one LP met the 70% coverage target (BreastScreen South Ltd). Three LPs showed an increasing trend (BreastScreen Midlands, BreastScreen Coast to Coast, BreastScreen Central). BreastScreen Auckland Ltd may be trending down.
- Coverage for Māori women aged 45–49 years was 75% in BreastScreen South Ltd and 69% in BreastScreen Waitemata Northland. Coverage in other LPs ranged from 56% to 65%.
- Pacific coverage exceeded the target in BreastScreen Waitemata Northland, BreastScreen Counties Manukau, BreastScreen Auckland Ltd for women aged 45–49 and 50–69 years. BreastScreen Central showed an increasing trend with a closing gap for women aged 50–69. In other LPs Pacific coverage was below target and lower than for non-Māori non-Pacific women.
- For total women aged 50–69 years, four LPs achieved the target coverage: BreastScreen Coast to Coast, BreastScreen Central BreastScreen South Ltd, BreastScreen Otago and Southland. The remainder screened 66% or more of their populations.
- For total women aged 45–49 years four LPs achieved over 70% coverage and the remainder screened 67% or more.

BreastScreen South Ltd achieved the highest 2-year coverage for Māori women, exceeding the target of 70% for women aged 50–69 years (71%). BreastScreen Auckland Ltd and BreastScreen Midlands had the lowest coverage in this age group at 58% and 60% respectively. For Māori women aged 45–49 years, BreastScreen South Ltd screened 75% and BreastScreen Waitemata Northland 69%. Coverage in other LPs ranged from 56% to 65%. The additional numbers needed to achieve the target for Māori women aged 50–69 years by individual LPs varied between 5 per month (BreastScreen Otago and Southland) and 64 per month (BreastScreen Midlands).

The target was achieved for Pacific women in both age groups by three LPs (BreastScreen Waitemata Northland, BreastScreen Counties Manukau, BreastScreen Auckland Ltd). Coverage in these LPs was higher for Pacific women than for non-Māori non-Pacific women. Coverage of Pacific women aged 50–69 years in the BreastScreen Central region increased significantly to 68%, while remaining at 58% for the 45–49 year age group. In other LPs, Pacific participation was below the target and significantly less than non-Māori non-Pacific participation. To achieve the target for Pacific women aged 50–69 in all regions, a further 2 to 4 women per month needed to be screened by the LPs that were under target.

For total women aged 50–69 years, four of the eight LPs achieved the target coverage. Coverage was highest in BreastScreen South Ltd (78%) and lowest in BreastScreen Auckland Ltd (66%).

For total women aged 45–49 years, four LPs had over 70% coverage, highest in BreastScreen South Ltd at 84%. Others achieved 67% or 68% screening participation in this age group.

Timely rescreening – below target after initial screens, Māori and Pacific lower than others, overall declines continued but improved in two regions

- Two LPs met the target of 75% rescreened within 20–27 months of an **initial screen** among women aged 50–67 years (BreastScreen Coast to Coast at 80% and BreastScreen Central at 76%). Rates increased for women in BreastScreen Central, while BreastScreen Auckland Ltd and BreastScreen Otago and Southland showed a declining trend.
- Timely rescreening rates were lower for Māori than for non-Māori women after initial screens in each LP apart from BreastScreen Otago and Southland where the non-Māori rate decreased to a level similar to that of Māori women. Pacific rates were significantly lower in four LPs.
- The target of 85% for timely rescreening after a **subsequent screen** was met for Māori women

by three LPs, for Pacific women by two LPs, and for non-Māori non-Pacific women by six LPs.

- Māori and Pacific rates of timely rescreens after a subsequent screen were lower than for other women in all LPs apart from BreastScreen Otago and Southland (where the non-Māori rate had declined). The gap between Māori and non-Māori widened in BreastScreen Midlands.

The proportion of women aged 50–67 years who were rescreened within 27 months of their previous screen varied significantly between LPs but was consistently lower for women whose previous screen was their first with BSA. Two LP achieved the target of 75% after an initial screen and four LPs achieved the target of 85% or more for total women whose previous screen was a subsequent screen.

Timely rescreening rates after initial and subsequent screens were lower for Māori than for non-Māori women in each LP apart from BreastScreen Otago and Southland where the rate for non-Māori women had declined.

LPs showing a possible downward trend in rescreen rates after subsequent screens included BreastScreen Auckland Ltd, BreastScreen Otago and Southland and BreastScreen Counties Manukau. BreastScreen Central showed an upward trend for both Māori and non-Māori. Gaps widened in BreastScreen Waitemata Northland where Māori and Pacific rates declined while non-Māori remained stable, and in BreastScreen Midlands where non-Māori rates increased while Māori and Pacific rates stayed the same.

Screening quality – few differences between LPs

- BreastScreen Coast to Coast had a higher proportion of women screened in mobile units who had more than four images taken per screening episode.
- Technical recall rates and technical reject rates were within the target range for mobile and fixed units for all LPs.

BreastScreen Coast to Coast had a higher proportion of women having more than four images taken in mobile units than other LPs, and did not meet the target for Māori, Pacific or other women. The target was met for total women by all other LPs. Four LPs met the targets for Māori women screened in fixed units, and four in mobile units. For Pacific women five LPs met the target in fixed units and four achieved the target in mobile units. LPs not meeting the target for each group of women could look at strategies to reduce the number of women experiencing more than four images per screening episode.

Technical recall rates in fixed and mobile units were within the target range with no variation between LPs. The change to digital imaging was completed by the period of this report.

There was no variation in the proportion of rejected images. All were within the target range.

Assessment – some variability in initial screens but not in subsequent screens

- All LPs met the target values for referrals to assessment, false positives, specificity and positive predictive value for subsequent screens.
- For initial screens, three LPs were outside the target ranges for rates of referral to assessment and false positives, but most had positive predictive values within the target range. No LP met the 93% target for specificity for total women having initial screens, but five were within 3 percentage points.

For Māori, Pacific, and other women having subsequent screens, the rates of referral to assessment, false positives, specificity, and positive predictive values were within the target ranges in each LP.

There was some variability between LPs in assessment indicators for women having their first screen with BSA.

Among women having an initial screen with BreastScreen Waitemata Northland, BreastScreen South Ltd, and Breast Screen Otago and Southland rates of referral to assessment, false positives, and specificity were outside the expected value but the target value for the positive predictive value was met or was within the confidence interval. BreastScreen Otago and Southland showed an increasing trend in referral rates and false positives and a decreasing trend in positive predictive value and specificity for initial screens.

Biopsies – some variation in the proportion of benign open biopsies weighing less than 30g

Over 90% of women had a preoperative diagnosis of breast cancer in each LP.

The target for benign open biopsy rates was met or was within the confidence interval for all LPs for initial and subsequent screens.

The proportion of benign open biopsies that weighed less than 30g was outside the target range of over 90% for three LPs (BreastScreen Midlands, BreastScreen Coast to Coast and BreastScreen South Ltd).

Early detection – no significant variability between LPs

- There was little variation between LPs in rates of invasive breast cancer detection from subsequent screens and no significant variation in detection rates from initial screens.
- All LPs achieved at or above target levels for detection of small breast cancers and cancers without nodal involvement.
- The proportions of breast cancers detected that were DCIS were within the target range for all LPs.

For all LPs the indicators for detection of invasive breast cancer, tumours 15mm or smaller, and cancers without nodal involvement were on target or the target was within the 95% confidence interval for initial and subsequent screens. There was little variation between LPs in these indicators.

The proportions of screen-detected breast cancers that were DCIS were within the target range for each LP.

Timeliness - variation evident in each indicator

- Two LPs showed significant improvement in the proportions of women receiving their screening results in 10 working days, four maintained high levels.
- Three LPs achieved the 90% target for the proportions of women receiving a timely offer of their first assessment appointment for women aged 50–69 years. Five LPs were below the 90% target but two showed significant improvement (BreastScreen Midlands and BreastScreen South Ltd).
- Most LPs achieved the target value (90% or more) for the percentage of women receiving their needle biopsy within five working days of their assessment. BreastScreen Auckland Ltd remained under target at 77%.
- Although relatively few women required an open biopsy, the 90% target for the percentage having the biopsy within 20 working days was met or within the confidence interval for only three of the eight LPs.

- Only three LPs met the target for the percentage of women receiving their final diagnostic biopsy results within five working days.

The proportions of women receiving their screening results within 10 working days varied significantly. BreastScreen Waitemata Northland, BreastScreen Counties Manukau, BreastScreen Auckland Ltd and BreastScreen Coast to Coast maintained high levels. Rates were trending down in BreastScreen Central but remained within the target range. BreastScreen Midlands and BreastScreen South Ltd showed significant improvement with BreastScreen Midlands achieving the target.

BreastScreen Waitemata Northland, BreastScreen Counties Manukau, and BreastScreen Coast to Coast achieved the 90% target for the proportions of women receiving a timely offer of their first assessment appointment for among women aged 50–69 years. BreastScreen Midlands and BreastScreen South Ltd showed significant improvement. BreastScreen Central showed a declining trend to 86%. BreastScreen Otago and Southland continued to decline with only 25% offered an appointment within 15 working days.

The 90% target for the percentage having their open biopsy within 20 working days was met or within the confidence interval for women in BreastScreen Auckland Ltd, BreastScreen South Ltd, BreastScreen Otago and Southland.

Three LPs met the target for the percentage of women receiving their final diagnostic biopsy results within five working days (BreastScreen Waitemata Northland, BreastScreen Coast to Coast and BreastScreen South Ltd). BreastScreen Auckland Ltd showed an increasing trend while BreastScreen Counties Manukau showed a decreasing trend.

Treatment – some variation in two indicators

- All LPs were below target for the proportion of women receiving their first treatment surgery within 20 working days, with BreastScreen Counties Manukau significantly lower than others. Two LPs had significant disparities between Māori and non-Māori women for this indicator, and another two showed significant differences between Pacific and non-Māori non-Pacific women.
- There was no significant variation between LPs in the total proportions of women having sentinel node biopsy as their first axillary procedure (a new indicator with no target).
- The proportion of women with invasive cancer who had breast conserving surgery and radiotherapy remained below target for BreastScreen Auckland Ltd (77%).
- All LPs met the targets for other treatment indicators. There were no significant differences between ethnic groups, including for receipt of adjuvant therapies.

Treatment indicators are reported for women whose cancer was detected by BSA during the four years to June 2015.

The proportion of women receiving timely surgical treatment remained significantly lower in BreastScreen Counties Manukau than in other LPs with less than one in three women receiving timely surgery (30%) compared to just over one in two women nationally.

Māori women in BreastScreen Coast to Coast and BreastScreen Central and Pacific women in BreastScreen Counties Manukau and BreastScreen Auckland Ltd were less likely than other women to receive their first treatment surgery in 20 working days.

There was little variation between LPs in the proportions of women having sentinel node biopsy as their first axillary procedure (ranging from 75% to 81%). The national rate is trending up but it

is difficult to identify trends at the LP level. BreastScreen Auckland Ltd had the highest rate at 81%. BreastScreen Midlands had a lower rate for Māori (70%) than for non-Māori (79%).

The proportion of women with invasive cancer who had breast conserving surgery and went on to have radiotherapy was similar for most LPs apart from BreastScreen Auckland Ltd.

All other treatment indicators were within the target range with little variation between LPs.

EQUITY ISSUES

BSA has a priority goal of providing equitable screening and achieving equitable outcomes for Māori, Pacific, and other populations in Aotearoa. Equity is a fundamental component of a high quality service. Systematic monitoring by ethnicity is a critical part of quality assurance and quality improvement.

Māori women

Māori women have higher underlying breast cancer incidence and mortality rates than other women. If more Māori women have their breast cancer detected early the disparity in breast cancer mortality can be reduced. The higher incidence also means that more cancers will be detected per 1,000 Māori women screened than will be detected among 1,000 other women (i.e. screening is more cost effective).

There were no differences in the proportions of cancers that were small or that had not spread to the lymph nodes, and the rate of small cancers detected per 10,000 screens was higher for Māori than for non-Māori in this reporting period. Thus BSA is most certainly making a difference to breast cancer outcomes for Māori. The lower coverage and lower rate of timely rescreens among Māori are the two key factors preventing BSA from achieving greater reductions in breast cancer mortality and morbidity among the Māori population.

A strong, ongoing commitment to prioritising Māori women is required to firstly achieve and maintain the target levels of coverage and timely rescreens, and then to achieve equitable rates.

Māori women are also waiting longer for their first surgical treatment than non-Māori non-Pacific women. Regional differences in wait times may contribute to longer waiting times for Māori.

All other treatment indicators were similar for Māori and non-Māori.

Pacific women

Pacific women have a higher incidence and mortality rate than non-Māori non-Pacific women. The BSA Mortality Evaluation found that participating in the screening programme had a significant impact on Pacific women's risk of dying from breast cancer. Thus BSA is a critical component in breast cancer control for Pacific women in Aotearoa.

Close to three-quarters of Pacific women in the screening age group reside in three LP regions: BreastScreen Waitemata Northland, BreastScreen Auckland Ltd, and BreastScreen Counties Manukau. The national rates are therefore strongly influenced by the performance of these LPs. Coverage is higher for Pacific women in these LPs than for Māori or other women, as is the national coverage rate.

However, Pacific coverage in other LPs is lower than target and lower than non-Māori non-Pacific coverage, despite the smaller numbers of women to be screened. Equitable coverage for Pacific

women will be achieved when participation is high in all regions. Relatively small additional numbers of Pacific women per month were required to achieve the target of 70% across all regions.

Although coverage was higher overall for Pacific women, timely rescreening rates were lower than for non-Māori non-Pacific women after both initial and subsequent screens.

Pacific women were less likely to receive their first treatment surgery within 20 working days than non-Māori non-Pacific women, and less likely to receive radiotherapy after breast conserving surgery for invasive cancer. No other treatment indicators showed a significant difference between Pacific and other women.

A range of tools are available to support health systems and providers to monitor for equity and implement strategies to achieve equitable outcomes (see previous monitoring report). Strategies that improve equity generally benefit all populations. Equity needs to be prioritised at the system level (policy, contracting, standard setting, monitoring and responses to identified inequities), organisation level (are systems in place to identify and respond promptly to equity issues?), workforce level (e.g., composition, professional development and expectations), and at the community level.

IS BSA MAKING A DIFFERENCE?

- BSA is meeting its goals for early detection of breast cancers among screened women.
- More than half of the invasive breast cancers detected by BSA were detected while they were still small and three-quarters had not spread outside of the breast. These cancers have a better prognosis and reduced morbidity from treatment.
- Māori women were more likely than non-Māori to have a small breast cancer detected. Increasing the coverage and timely rescreening of Māori women will help achieve its goal of equitable breast cancer mortality outcomes for Māori women in Aotearoa.
- Pacific women have the highest national coverage and an increasing rate of detection of small breast cancers.
- Although younger women have lower detection rates, the proportions of screen detected cancers that are small and node negative are close to those of older women.
- The programme aims to minimise harm by keeping false positive rates and open biopsy rates as low as possible. These were generally within the target range for this period.
- Four out of five women had breast conserving surgery, with the majority (90%) also having radiotherapy. Chemotherapy and hormone therapy rates were similar for all ethnic groups.
- Trends in some timeliness indicators show signs of a system under stress. Reducing wait times for first assessments, open biopsies, first surgical treatment could reduce anxiety and improve outcomes for screened women.
- Continuing declines in timely rescreening rates need to be addressed since they may affect future rates of small cancer detection and interval cancer rates.

Maximising benefits

Detecting breast cancers while they are small and before they have spread to the axillary lymph nodes (armpit) means that the treatment can be breast conserving and cause less long-term illness

and disability since fewer lymph nodes need removing reducing the chance of swelling in the arm. The risk of dying from breast cancer is also reduced.

Among invasive cancers detected by BSA, two-thirds detected from a first BSA screen and three-quarters detected from a subsequent screen had not spread to the lymph nodes. This level is being maintained over time. There were no significant differences between Māori, Pacific and other women in these proportions.

Half of the cancers detected from initial screens were small (15mm or less in diameter) as were nearly two-thirds of those detected from subsequent screens (slightly lower among Pacific women). Most women were treated with breast conserving surgery and only underwent a single surgical procedure.

These indicators show BSA is making a positive difference to breast cancer mortality and morbidity in Aotearoa.

Minimising harms

High quality screening programmes aim to minimise any harms from screening, since well women are invited to participate in an intervention. Possible harms might include unnecessary surgery, or increased anxiety while waiting for an assessment or biopsy results.

BSA is achieving most targets relevant to harm minimisation, including low numbers of women recalled for technical reasons; low false positive rates for subsequent screens; nearly all women have a definitive diagnosis without undergoing open surgery; the benign biopsy rate was on target; as was the timely receipt of needle biopsy.

Improvements in the timely receipt of screening results and the proportion of women waiting longer for their first assessment appointment are positive. Continuing low proportions of women receiving timely open biopsies, prompt reports of their final diagnostic biopsy results, and timely surgical treatment are of concern, since they heighten anxiety levels for some women and potentially affect outcomes. The impact of the government's Faster Cancer Treatment target on the ability of BSA to achieve its target for time to first treatment surgery needs ongoing assessment.

The decreasing trend in timely rescreening is also of concern since the effectiveness of mammography screening depends on regular screening within the recommended screening interval.

In summary BSA is providing a high quality screening service to women in Aotearoa, and is contributing to reduced illness and deaths from breast cancer. Most potential harms are being minimised. Improvements in some timeliness indicators, increased coverage of Māori women nationally, increased coverage of Pacific women in five regions, and timely rescreening, will help to enhance the programme's effectiveness and contribution to equitable outcomes from breast cancer for women in Aotearoa.

APPENDIX ONE: RECOMMENDATIONS FROM THE BSA ADVISORY GROUP

- Work is needed to increase Māori coverage rates and close the equity gap. Effort needs to be put into engaging with Māori and Pacific women while maintaining a high quality service for all eligible women.
- Improving re-screening rates should be a focus for the programme.
- Undertake an investigation of the high number of biopsies over 30g.
- Work with all those involved in providing biopsy results to review the process and system changes that might be required to ensure that women receive their final diagnostic biopsy result within five working days.

APPENDIX TWO: RECOMMENDATIONS FROM THE MĀORI MONITORING AND EQUITY GROUP

- There should be focussed engagement for 45–49 year old Māori women, who have lower participation rate in screening, but higher rates of cancer detection.
- To increase access to the service, Māori women must all be provided with information about after-hours screening appointments, be empowered to negotiate appointment times that are convenient *and* be proactively supported to access these appointment times.
- There should be continued work to make women feel welcome when attending breast screening clinics (to improve coverage and rescreening rates)
 - Training for staff to support whānau to feel welcome and accommodated at screening clinics
 - Whānau rooms
 - Gowns that can fit any women
- Look at what fail-safes are in place when women miss appointments
- Further analysis of the higher proportion of Māori women having more than 4 images per screen compared to non-Māori women
- Work on co-ordination of care with support services that help women through treatment services and address longer wait time to first surgical treatment
- Support for “a strong, ongoing commitment to prioritising Māori women” (pg 15, BSA PMR)