

BreastScreen Aotearoa Programme Monitoring Report

For Māori, Pacific and Total women screened
during 1 July 2017 to 30 June 2019

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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 2019. Treatment indicators are for women diagnosed through screening during the four-year period to June 2018.

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 cancer.

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 following up 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 screened¹.

BSA has eight Lead Provider (LP) regions. Each LP is responsible for providing or subcontracting mammography screening and assessment services in their region. Support to Screening 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 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 women² 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.

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 online.

This report summarises the results of BSA quality indicators related to coverage, screening quality and assessment, early detection, and timeliness for women screened between 1 July 2017 and 30 June 2019. Breast cancer treatment indicators are summarised for women whose breast cancer was detected by BSA during the four-year period to 31 December 2018.

The period covered by this report was prior to the COVID-19 Pandemic. Future reports will include data from the Level 4 Pandemic Alert lockdown in March and April 2020 when breast screening was paused resulting in lower coverage.

The report has four sections:

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

¹ Ministry of Health. 2016. Summary of the BreastScreen Aotearoa Mortality evaluation 1999–2011. Wellington: Ministry of Health. Available on www.health.govt.nz

² 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 online data tool includes tables and graphs of trends over time for all indicators for women aged 45–49 and 50–69 years by ethnicity and Lead Provider. Apart from detection related and assessment related indicators, this section generally refers to indicators for women aged 45–69 years, unless otherwise indicated. Because breast cancer incidence varies by age, detection and assessment related indicators are reported separately for the two age groups.

Coverage – under 70% for Māori women, over 70% for Pacific and other women and inequitable

- Coverage was on target (over 70%) for Pacific and non-Māori non-Pacific women aged 45 to 69 years but not for Māori. BSA screened 66% of eligible Māori women aged 45 to 69 years compared to 73% of Pacific and 73% of non-Māori non-Pacific women.
- An additional 3,602 Māori women aged 45 to 69 years needed to be screened to reach the target. To achieve the same coverage as non-Māori, BSA needed to screen 6,001 more Māori women.

BSA screened 543,254 women during the two years to 30 June 2019, 10,364 more than the previous biennium to 30 June 2018. The total eligible population (aged 45–69 years) increased by 9,200 (or 1.2%) between the biennia to June 2018 and to June 2019. The total number of women screened also increased by 1.2%.

Previously the target of more than 70% of eligible women receiving a screen within the most recent 24-month period applied only to women aged 50–69 years. The target now applies to all eligible women aged 45–69 years.

Māori screening participation remained below the >70% target but increased by 1% to 66% for women aged 45–69 years (64% for 45–49 and 66% for women aged 45–69 years). To achieve the target a further 3,602 Māori women needed to be screened. To achieve equitable coverage with non-Māori, 6,001 more were needed.

Māori screening coverage generally increased by age group, ranging from 64% of women aged 45–49 years to 69% of women aged 65–69 years. In contrast, 73% of eligible Pacific women and 73% of non-Māori non-Pacific women aged 45–69 years were screened with over 70% coverage in each age group. For total women aged 45–69 the biennial coverage was 72%.

Of note, the total number of non-Māori women screened beyond 70% was 18,143, three times the additional number of Māori women needed to achieve the target, and 3,000 higher than the previous biennium.

Although the target coverage for Pacific women was met overall, it wasn't achieved by all LPs. If all LPs had achieved >70% coverage of Pacific women aged 45–69 years, a further 794 needed to be screened in total.

A note of caution: these numbers were calculated prior to the updated population projections based on the 2018 Population Census and may differ once the new projections are applied. It is possible that the gap between Māori and non-Māori coverage may be greater than that presented here.

Timely rescreening – lower after initial screens but increasing trend, disparities remain

- Among women aged 45–69 years, 67% of Māori, 66% of Pacific, 78% of other women were rescreened between 20 and 27 months of an initial screen (target 75% or more). After a subsequent screen, 81% of Māori, 79% of Pacific and 88% of other women had a timely rescreen (target 85% or more).
- Timely rescreening after an initial screen varied by age. Among women aged 50–67 years at their first screen with BSA, 56% of Māori and Pacific women were rescreened within 27 months, an increase of 5% for both groups, while 68% of other women had a timely rescreen (an increase of 1%). Among women aged 45–49 years at their first screen, 70% of Māori, 68% of Pacific and 81% of other women were rescreened within 27 months.
- After a subsequent screen, 87% of non-Māori non-Pacific women aged 45–69 years were rescreened between 20–27 months (target 85% or more), while 81% of Māori and 80% of Pacific women had a timely rescreen. There was little difference between age groups.

Women who screen regularly have a lower risk of dying from breast cancer than those who screen less regularly³. 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.

Among women aged 45–69 years, 67% of Māori, 66% of Pacific and 78% of other women were rescreened within 20–27 months of their first screen with BSA. The proportions receiving timely rescreen after a subsequent screen were higher at 81% for Māori, 79% for Pacific and 88% for other women.

Women who were aged 45–49 years at their initial screen were more likely to be rescreened within 27 months than those who aged 50–67 years. For Māori women, the proportions rescreened were 70% in the younger age group compared with 56% in the older age group. Likewise, for Pacific women, 68% compared to 56% respectively, and for non-Māori non-Pacific women, 81% compared to 68%.

The rates of timely rescreens after an initial screen among women aged 50–67 years have increased since the previous report by 5% for Māori and Pacific women and by 1% for other women.

The additional numbers of women aged 45–67 needed to be rescreened within 27 months to achieve the targets were 2,362 for Māori and 1,375 for Pacific women. The number of non-Māori non-Pacific women rescreened beyond the target values was 10,329. To achieve equitable rates with non-Māori non-Pacific women, the additional numbers required were 3,657 Māori and 1,925 Pacific women.

Screening quality – technical recall rates and image quality on track. Proportions of women having no more than four images increased

- Technical recall rates in mobile and fixed units remained in the target range ($\leq 0.5\%$).
- The proportions of women having no more than 4 images per screening episode were on target for Māori and non-Māori non-Pacific women ($>80\%$) and just under target for Pacific women (79%).

³ Ministry of Health. 2015. Summary of the BreastScreen Aotearoa Mortality Evaluation 1999 to 2011. Wellington: Ministry of Health.

- The rate of rejected images (1%) remained well within the target range (<3%).

With all screening units using digital technology the low rate of women recalled for technical reasons has been maintained at 0.2% in fixed units and 0.3% in mobile units, within the target range of less than 0.5%. This indicator is monitored to ensure the number of women having to return to a screening unit for further images to complete their screening episode is minimal.

The >80% target for the proportions of women having no more than four images was met for Māori (81%) and non-Māori non-Pacific women (87%), with the proportion of Pacific women just under target at 79%.

Less than 1% of images were rejected (target <3%).

Timely reporting of screening results – on target

- The proportion of women who received their screening results within 10 working days remained within the target range of 90% or more but decreased by 2% to 94%.

Assessment – quality on track, timeliness below target

- Targets for assessment quality indicators continued to be met for all groups of women aged 50–69 years having a subsequent screen. Positive predictive values were higher for Māori women than for non-Māori women having initial or subsequent screens.
- The proportion of women offered their first assessment appointment within 15 working days decreased slightly to 84% (target 90%), lower for Pacific women (79%).
- For women aged 45–49 years, all indicators were as expected. Positive predictive values were around half those of women aged 50–69 years.

For women aged 50–69 years having an **initial screen** the rates of referral to assessment, false positives, and positive predictive value were on target or the target was within the confidence interval for each population group. The target of <10% for assessment rates was met or was within the confidence interval and similar for Māori, Pacific and other women aged 50–69 years (between 9% and 11%). False positive rates were within the target range of <9%, and positive predictive values were well within the target range of 9% or more for all groups. Around one in six Māori, one in nine Pacific, and one in nine other women referred for an assessment from an initial screen had a cancer detected. Among women referred for assessment, Māori women were two-thirds more likely than non-Māori to have cancer detected. Specificity was just below the target of >93% at 91%.

All assessment quality indicators for women aged 50–69 years were within the target ranges for **subsequent screens** overall. Among women aged 50–69 years who had a **subsequent screen**, the rate of referral for assessment was 3.7% for Māori and Pacific women and 3.3% for other women (target <5%). False positive rates were 2.5% (target <4%). Positive predictive values were around twice the target of 9% or more at 19% overall. Māori women referred for assessment were 1/3 more likely than non-Māori women to have a cancer detected (24% compared to 19% of Pacific and 18% of other women). Specificity was 97%, well within the target range >93%.

In each population, assessment quality indicators for women aged 45–49 years were within the expected values of <9% assessment rate, <8% false positives, >6% PPV for initial screens and 92% for specificity. For women having subsequent screens, they were also within the expected ranges of <4.5% referred to assessment, <4% false positives, >8% positive predictive value, and >95% specificity.

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. This indicator

declined slightly to 84% for Māori and non-Māori women and remained lower for Pacific women at 79%.

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

- Most women (95%) had a definitive diagnosis of breast cancer without open surgery and within 5 working days of their assessment (96%).
- Some women required open surgery to obtain a definitive diagnosis. Fewer than one per 1,000 women screened had a benign open biopsy. Of those women, most (84%) had a benign biopsy that weighed under 30g but the target of >90% was not reached.
- Just over half (57%) had their open biopsy within 20 working days (target $\geq 90\%$).
- The proportion of women who received their final diagnostic biopsy results within 5 working days was 85% overall (target $\geq 90\%$).

Around 95% of women diagnosed with breast cancer had a definitive diagnosis from a needle biopsy, meeting the target value of >90% for all groups of women. Most percutaneous biopsies (96%) were received within 5 working days of assessment.

The benign open biopsy rates were within the target ranges for initial (≤ 3.5 per 1,000) and subsequent screens (≤ 1.6 per 1,000). Fewer than three women per 1,000 having an initial screen and less than one per 1,000 women having a subsequent screen underwent an open biopsy for a benign condition. 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%. This indicator relates to minimising harms from surgery that might not have occurred without screening.

The proportion of women who received their open biopsy within 20 working days of being notified that they needed it was 57% (target $\geq 90\%$). This indicator increased by 26 percentage points for Pacific women from 31% to 58%.

The proportion of women who received their final diagnostic biopsy results within five working days was 85% overall (target $\geq 90\%$), lower for Māori (81%) than for non-Māori women (86%). This indicator aims to minimise anxiety and delays in treatment planning.

Early detection – on target for all indicators for Māori, Pacific and other women aged 45–49 and 50–69 years

- Invasive breast cancer targets were met for all populations.
- Māori women were more likely to have an invasive breast cancer detected from an initial and from a subsequent screen than non-Māori women in both age groups.
- There were no significant differences in rates of invasive cancer detection between Pacific and non-Māori non-Pacific women.
- The targets for detection of invasive cancers that are small ($\leq 15\text{mm}$) were met or were within the confidence interval for all population groups.
- The proportion of cancers that were DCIS (23%) was in the target range for women aged 50–69 years and higher for women aged 45–49 years (30%). Among Māori women aged 50–69 years, the proportion was lower at 17%.
- The targets for the proportions of invasive cancers without nodal involvement were met or were within the confidence interval for all population groups.

The invasive cancer detection rates were in the target range for initial and subsequent screens for each group of women, including the new targets being trialled for women aged 45–49 years.

For women aged 45–49 years who had their first screen with BSA, the new target of ≥ 3.8 invasive cancers per 1,000 women screened was met at 3.9 per 1,000 overall, 5.6 per 1,000 for Māori, and 4.5 per 1,000 for Pacific women. For those who had a subsequent screen, the new target of ≥ 2.4 per 1,000 was also met for all women at 2.7 per 1,000 and for Māori (4.0 per 1,000) and Pacific women (3.1 per 1,000).

The new targets for the detection of small cancers $\leq 15\text{mm}$ were also met for women aged 45–49 years. For those who had an initial screen the overall rate was 19.9 per 10,000 (target ≥ 19.0) and 25.7 per 10,000 Māori women. For women who had a subsequent screen the target of ≥ 12.0 per 10,000 screens was also met at 15.2 overall and 16.5 for Māori women. For Pacific women both targets were within the confidence interval. The proportions of invasive cancer detected that had no nodal involvement were 64% for initial screens and 70% for subsequent screens.

Among women aged 50–69 years, invasive cancer detection rates were within the target ranges for all groups of women having an initial or a subsequent screen. Over half 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 twice as high for Māori as for non-Māori having an initial screen and nearly 50% higher for those having a subsequent screen. There were no significant differences between Pacific and non-Māori non-Pacific women. The proportions of invasive cancers detected that had no nodal involvement were 76% for initial screens (target $>70\%$) and 79% for subsequent screens (target $>75\%$).

The proportion of breast cancers that were DCIS was 23%, within the target range of 10% to 25% for women aged 50–69 years, lower for Māori women (17%) and similar for Pacific women (25%). Among women aged 45–49 years, the overall proportion of screen-detected cancers that were DCIS was 30%.

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

- Just over half of BSA women (57%) had their first surgical treatment within 20 days of receiving their final diagnosis (target 90%). Māori (50%) and Pacific women (50%) were less likely than other women (59%) to receive timely surgery.
- Among women whose invasive cancer was detected by BSA during the four years to 30 June 2018, and whose cancer was $\leq 30\text{mm}$, 81% had sentinel node biopsy as their first axillary procedure, slightly lower for Māori women (76%).
- The proportion of women who had radiation therapy with breast conserving surgery for invasive cancer was 90% (target 95% or more) with a gradual declining trend continuing.
- The targets were met for other treatment indicators, for all populations.

The proportion of women who had their first surgical treatment within 20 working days of diagnosis during the four years to December 2018 was below the 90% target for each population.

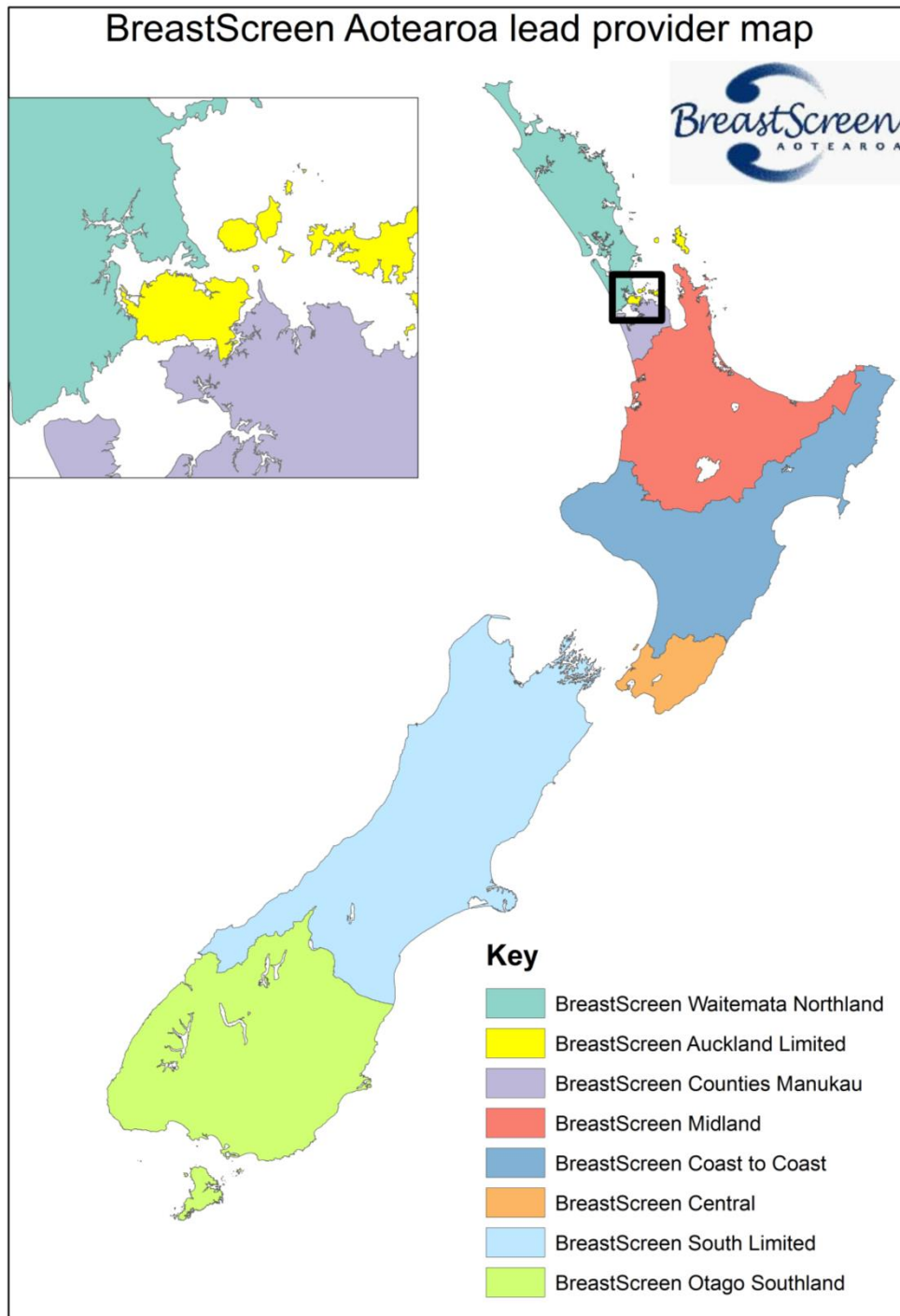
Among women with invasive breast cancer 30mm or less, 81% had sentinel node biopsy as their first axillary procedure. There is no target for this indicator. Sentinel lymph node biopsy is useful for staging of cancers and may help avoid more extensive lymph node surgery.

The majority of women diagnosed with DCIS or invasive cancer $\leq 20\text{mm}$ had breast conserving surgery (88% and 81% respectively).

The proportion of women who had radiation therapy with breast conserving surgery for invasive cancer continued a gradual decline to 90% (target 95% or more).

LEAD PROVIDER VARIATION

Figure 1: Map of BreastScreen Aotearoa Lead Providers



The eight BSA Lead Provider regions are shown in the figure above.

Coverage – LPs varied in coverage and equity

- For Māori women aged 50–69 years, the target coverage of 70% was within the confidence interval or was met by four LPs. BreastScreen Auckland Ltd remained at 57% and BreastScreen Midland reached 62%. Other LPs achieved coverage of 67% or 68%. BreastScreen Midland has the highest number of eligible Māori women and needed to screen a further 1,346 Māori women in this age group over the two-year period to reach the target.
- Coverage for Māori women aged 45–49 years was highest in BreastScreen Waitemata Northland (71%), BreastScreen Otago Southland (70%), BreastScreen South Ltd (69%), and BreastScreen Counties Manukau (69%). Coverage in other LPs ranged from 58% (BreastScreen Central) to 64% (BreastScreen Coast to Coast).
- Coverage was slightly higher for Māori women than for non-Māori women in BreastScreen Waitemata Northland in both age groups.
- For Pacific women aged 50–69 years, the 70% target was met or within the confidence interval for Pacific women in BreastScreen Counties Manukau (85%), BreastScreen Auckland Ltd (71%), BreastScreen Waitemata Northland (70%) and BreastScreen Central (69%) In other LPs Pacific coverage ranged from 58% to 66% and was lower than for non-Māori non-Pacific women.
- For Pacific women aged 45–49 years, coverage ranged from 53% to 82% (BreastScreen Counties Manukau).
- For total women aged 50–69 years, six LPs achieved the target coverage. The other two screened 66% and 67% of their eligible populations.
- For total women aged 45–49 years four LPs achieved over 70% coverage and the remainder screened between 65% and 69%.

The 70% coverage target for Māori women aged 50–69 years was met or was within the confidence interval for BreastScreen Waitemata Northland, Central, South Ltd, and Otago Southland. BreastScreen Auckland Ltd had the lowest coverage in this age group at 57%, while BreastScreen Midland increased its coverage of Māori women by 2 percentage points to 60%. To achieve 70% coverage in this age group BreastScreen Midland needed to screen an additional 58 Māori women per month, Auckland Ltd an additional 21 per month, Coast to Coast 9 per month, Counties Manukau 10 per month.

For Māori women aged 45–49 years, coverage was between 69% and 71% in four LPs. Coverage was less than 65% in BreastScreen Central (58%), Midland (59%), Auckland Ltd (60%) and Coast to Coast (64%). If the 70% target was applied for women aged 45–49 years, the additional numbers of Māori women screened in this age group would range from 6 per month (Auckland Ltd) to 26 per month (Midland).

For Pacific women aged 50–69 years the 70% target was met or within the confidence interval in the four LPs with higher proportions of Pacific women. Other LPs ranged from 58% (BreastScreen Otago Southland) to 66% (Coast to Coast). To achieve the 70% target, the number of additional screens per month among these LPs were: 5 in BreastScreen Midland, 2 in Coast to Coast, 4 in South Ltd, and 2 in Otago Southland.

For most LPs, coverage was similar for Pacific women aged 45–49 (apart from BreastScreen Central and Waitemata Northland which had lower coverage in the younger age group). If the 70% target was applied to women aged 45–69 years, the additional numbers of Pacific women needed to be screened per month were 5 in BreastScreen Waitemata Northland, 8 in Midland, 3 in Coast to Coast, 10 in Central, 4 in South Ltd and 3 in Otago Southland.

For non-Māori non-Pacific women aged 50–69 years, six of the eight LPs achieved the target coverage. Coverage was highest in BreastScreen South Ltd (77%) and Coast to Coast (76%) and lowest in Auckland Ltd (65%).

For non-Māori non-Pacific women aged 45–49 years, six LPs had over 70% coverage, highest in BreastScreen South Ltd at 85%. The other two LPs each achieved 64% (BreastScreen Auckland Ltd and Waitemata Northland).

Timely rescreening – lower after initial screens, higher in young women. Māori and Pacific rates lower than others in most LPs, variation between LPs

- Two LPs met the target of 75% rescreened within 20–27 months of an **initial screen** among total women aged 50–67 years (BreastScreen Coast to Coast at 76% and Central at 81%). Rates increased for women in BreastScreen Counties Manukau and Midland.
- Timely rescreening rates after an initial screen were lower for Māori than for non-Māori women aged 50–67 years in most LPs apart from BreastScreen Waitemata Northland, Central, and Otago Southland. The target was met for Māori women by BreastScreen Central (75%). Possible upward trends were shown in BreastScreen Auckland Ltd (to 50%) and Midland (to 46%).
- Timely rescreening after an initial screen was significantly lower for Pacific women aged 50–67 in four LPs. The target within the confidence interval in three LPs and an upward trend was shown in three LPs.
- Timely rescreening rates after an initial screen were higher among women aged 45–49 than among women aged 50–67 years.
- The target of 85% for timely rescreening after a **subsequent screen** was met or was within the confidence interval for Māori, Pacific, and total women aged 50–67 years in BreastScreen Coast to Coast, Central, and Otago Southland. Four other LPs met the target for non-Māori non-Pacific women and one other for Māori women.
- Inequities in rescreening rates between Māori or Pacific and other women were generally greater after initial screens than after subsequent screens with the exception of BreastScreen Waitemata North.

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.

Initial screens

Two LPs (BreastScreen Coast to Coast and Central) achieved the target of 75% after an initial screen for total women. A possible upward trend was shown by BreastScreen Auckland

For Māori women aged 50–67 years at their initial screen, the rescreening target was met by BreastScreen Central (75%) and was within the confidence interval for Otago Southland (66%). A possible upward trend was shown by BreastScreen Auckland (50%).

Timely rescreening after an initial screen was significantly lower for Pacific women than for non-Māori non-Pacific women aged 50–67 in four LPs. The target was within the confidence interval in three LPs: BreastScreen Central (70%), Coast to Coast (64%) and Midland (64%). An upward trend was shown in BreastScreen Waitemata Northland (57%), Coast to Coast (56%) and Midland (64%).

Subsequent screens

For Māori women aged 50–67 at their previous subsequent screen, the target of 85% or more rescreened within 27 months was met for Māori women by four LPs (BreastScreen Coast to Coast, Central, South Ltd, and Otago Southland). Rescreening rates in other LPs ranged from 76% to 80%. Māori rescreening rates were lower than non-Māori rates in all LPs.

To achieve the target timely rescreening rate for Māori women after subsequent screens LPs needed to rescreen a further 310 (BreastScreen Waitemata Northland) 285 (Counties Manukau, 107 (Auckland Ltd), 758 (Midland, 18 (South Ltd), and 13 (Otago Southland) over the two-year period.

For Pacific women aged 50–67 years, the 85% target was met or was within the confidence interval for three LPs (BreastScreen Otago Southland, Central, Coast to Coast), and was 80% or more in Counties Manukau and Waitemata Northland. Other LPs ranged from 73% to 78%.

The target was met by most LPs for non-Māori non-Pacific women with two just under target at 83% and 84%.

Screening quality – few differences between LPs

- Technical recall rates and technical reject rates were within the target range for mobile and fixed units for most LPs. Technical recall rates continued to increase in BreastScreen Central to 1.3%.
- All LPs met the target of >80% for the proportion of total women who had four images or fewer per screening episode.

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

- The target values for referrals to assessment, false positives, specificity and positive predictive value for subsequent screens were met or within the confidence interval for all LPs.
- For initial screens, one LP was outside the target ranges for rates of referral to assessment, false positives and specificity, but the target was met for positive predictive value. Only one LP met the >93% target for specificity, but most were within 4 percentage points. The target was met or was within the confidence interval for assessment rates, false positives, and positive predictive values for all other LPs.

For Māori, Pacific, and other women having subsequent screens, the target value was met or was within the confidence interval for rates of referral to assessment, false positives, specificity, and positive predictive values in each LP.

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

For women having an initial screen, BreastScreen Coast to Coast was well within the target ranges for all assessment related indicators. For those having an initial screen with BreastScreen Otago Southland rates of referral to assessment, false positives and specificity were outside the target ranges but the positive predictive value was on target. For other LPs the targets were met or were within the confidence interval for assessment rates, false positives and positive predictive values, but specificity was below the target value.

Biopsies – no significant variability between LPs

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

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

There were no significant differences between LPs in the proportions of benign open biopsies weighing less than 30g, but some variation in trends.

Open biopsies for a benign condition are relatively rare in BreastScreen Aotearoa. Among those who did have a benign open biopsy, most weighed less than 30g. Two LPs met the target of >90% for this indicator: BreastScreen South Ltd which has been trending up, and Auckland Ltd. In other LPs the proportions ranged from 70% to 88% and the target was within the confidence interval for each.

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 target levels for detection of small invasive breast cancers.
- The proportions of breast cancers detected that were DCIS were within the target range for all LPs.

For all LPs the target was met or was within the 95% confidence interval for rates of detection of invasive breast cancers among women aged 45–49 and 50–69 years. The targets were also met by each LP for the rate of tumours 15mm or smaller for initial and subsequent screens in each age group. There was little variation between LPs in these indicators. The targets for the proportion of screen-detected cancers without nodal involvement were also met or were within the 95% confidence interval for each LP.

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

Timeliness - variation evident in each indicator

- Five LPs achieved the target of 90% with over 95% receiving their screening results within 10 working days, while three were 1% or 2% under target.
- One LP was on target for the proportion of women aged 45–69 years receiving their offer of a first assessment appointment within 15 working days (BreastScreen Waitemata Northland). Four LPs were close to target at 87% or 88%. BreastScreen Auckland Ltd increased to 61%, while Coast to Coast declined to 73%.
- Most LPs were well within the target value of 90% or more for the percentage of women receiving their needle biopsy within five working days of their assessment. BreastScreen Auckland Ltd showed an increasing trend to 85%.
- The 90% target for the percentage having their open biopsy within 20 working days was met by BreastScreen South Ltd and Otago Southland.
- The target of 90% or more for the percentage of women receiving their final diagnostic biopsy results within five working days was met by or was within the confidence interval for four LPs. Others ranged between 72% and 85%.

The proportions of women aged 45–69 years who received their screening results within 10 working days were over 95% for five LPs, with three just under the 90% target at 88% or 89% (BreastScreen Auckland Ltd, Midland, and Central).

The 90% target for the proportion of women offered their first assessment appointment within 15 working days was within the 95% confidence interval or met by BreastScreen Waitemata Northland (93%) and Central (89%). BreastScreen Auckland Ltd increased to 64%, while Coast to Coast declined from 86% to 73%. BreastScreen Otago Southland remained around 80%. Other LPs were just under target.

Nearly all LPs exceeded the 90% target for women receiving their needle biopsy within 5 working days of assessment. BreastScreen Auckland continued to increase to 86%.

The 90% target for the percentage of women having their open biopsy procedure within 20 working days was met by BreastScreen South Ltd, Otago Southland and within the confidence interval for Auckland Ltd. BreastScreen Counties Manukau may be showing an increasing trend to around 30% for women aged 45–69 years. Other LPs ranged between 16% (BreastScreen Coast to Coast) and 57%.

The 90% target for the percentage of women receiving their final diagnostic biopsy results within five working days was met by or was within the confidence interval for BreastScreen Waitemata Northland, Manukau, Central and South Ltd. BreastScreen Midland remained at 77% and Otago Southland at 72%.

Treatment – some variation in timeliness of surgery and in radiotherapy

- All LPs were below the 90% target for the proportion of women receiving their first treatment surgery within 20 working days, ranging from 50% to 64% for women aged 45–69 years. BreastScreen Counties Manukau showed an increasing trend. BreastScreen Waitemata (63%) and Central (64%) were highest. Māori were less likely than non-Māori to receive timely surgery in each LP although the differences were not all significant.
- The proportion of women with invasive cancer who had breast conserving surgery and radiotherapy was below the target of 95% or more for three LPs.
- The targets for other treatment indicators were met by all LPs with no significant differences between ethnic groups.

Treatment indicators are reported for women whose cancer was detected by BSA during the four years to June 2018.

The proportion of women receiving timely surgical treatment was below target for all LPs ranging between 20% and 64% for women aged 45–69 years. BreastScreen Counties Manukau increased to 51%. Previous reports noted that further analyses of this indicator could include looking at the median time to first treatment surgery; stratifying by DCIS and invasive cancers; and whether neoadjuvant therapies have been used prior to surgery.

Māori and Pacific women whose cancer was detected by BreastScreen Auckland Ltd were less likely than other women to receive their first treatment surgery in 20 working days.

The proportion of women with invasive cancer who had breast conserving surgery and radiotherapy varied. The target of 95% or more was met or within the confidence interval for five LPs. BreastScreen Counties Manukau, Auckland and Midland were below target ranging from 77% to 86%.

There is no target for the proportion of women having sentinel node biopsy as their first axillary treatment. There was little variation in this indicator among most LPs but women aged 50–69 whose cancer was detected by BreastScreen Auckland Ltd were more likely than others to receive this procedure (88% compared to 80% overall).

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

There was some variation between LPs in the proportions receiving adjuvant hormone therapy within specific diagnostic groups. Previous reports noted a review of these indicators could focus specifically on groups most likely to benefit from the particular therapies and consider extending the monitoring to uptake and completion.

EQUITY ISSUES

BSA has a priority goal of providing equitable screening and achieving equitable outcomes for Māori, Pacific, and other populations in Aotearoa, recognising “there is no quality without equity” (Poynter et al, 2017)⁴. In March 2019 the Ministry of Health adopted the following definition of equity.⁵

“In Aotearoa New Zealand, people have differences in health that are not only avoidable but unfair and unjust. Equity recognises different people with different levels of advantage require different approaches and resources to get equitable health outcomes.”

The Ministry designed the definition to:

- align with Te Tiriti o Waitangi obligations to go beyond just remedying disadvantage and reducing inequities, enabling Māori to flourish and lead their aspirations for health
- be inclusive enough to incorporate all possible dimensions of equity (indigenous, socio-economic, geographically, disability, etc.)

Systematic monitoring for equity by ethnicity and geographic region is a critical element of quality assurance and quality improvement. BreastScreen Aotearoa data is available by ethnicity, two age groups, and by LP region, but not by socioeconomic position or small area deprivation, nor by disability status.

The need to rapidly accelerate Māori coverage and timely rescreening remain the most urgent equity issue facing BSA. There was a small closing of the gap between Māori and non-Māori non-Pacific rescreening rates after initial screens (from 15% to 12% difference) among women aged 50–67 years. For subsequent screens the gap remained at 7%.

Pressure to **achieve** equitable health outcomes for Māori is growing. The recent Hauora report⁶ by the Waitangi Tribunal includes equity as a Treaty principle, along with partnership, active protection and options (for kaupapa Māori services). The New Zealand Cancer Action Plan 2019–2029⁷ commits to equity-first prioritisation in cancer investment and monitoring and to achieving cancer survival equity by 2030. Parliament’s Māori Affairs Committee reported on its Inquiry into Health Inequities for Māori⁸ in August 2020, expressing concern that “the breast cancer screening service is not reaching Māori women at the same rate that it is reaching non-Māori women” and recommended “to the Government that it ensure all Māori women can access screening programmes, with a particular focus on Māori women residing in rural areas.”

Lead Providers who serve a high proportion of the eligible Māori population could make a significant contribution to achieving equity in coverage at the national level. BreastScreen Midland serves 26% of the Māori population and if it achieved 70% coverage for Māori women, the difference between the national Māori coverage and the target would be more than halved. BreastScreen Coast to Coast has the second highest population of Māori (19%) but, with higher coverage, accounts for only 13% of the national coverage gap. On the other hand, BreastScreen

⁴ Poynter M, Hamblin R, Shuker C, Cincotta J. 2017 Quality improvement: no quality without equity? Wellington: [Health Quality and Safety Commission](#). P.12

⁵ <https://www.health.govt.nz/about-ministry/what-we-do/work-programme-2018/achieving-equity>

⁶ Waitangi Tribunal 2019. Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry. WAI 2575. https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_150429818/Hauora%20Pre-PubW.pdf

⁷ Ministry of Health. 2019. *New Zealand Cancer Action Plan 2019–2029 – Te Mabere mō te Mate Pukupuku o Aotearoa 2019–2029*. Revised January 2020 Wellington: Ministry of Health. <https://www.health.govt.nz/publication/new-zealand-cancer-action-plan-2019-2029>

⁸ Māori Affairs Committee. 2020. Inquiry into Health Inequities for Māori: Report of the Māori Affairs Committee. Fifty-second Parliament. (Rino Tirikatene Chair) August 2020. Presented to the House of Representatives.

Auckland, which serves a relatively small proportion of Māori (6%), accounts for 17% of the gap because its coverage of Māori women is low.

Pacific coverage is higher than for non-Māori non-Pacific women but timely rescreening remains an equity priority for Pacific women. The gap between Pacific and non-Māori non-Pacific rescreening rates after initial screens reduced from a difference of 16% to 12% in women aged 50–67. For subsequent screens the gap closed from 11% to 8%.

Since the onset of the COVID Pandemic in Aotearoa in early 2020, LPs and Support to Screening Services are facing the additional challenge of catching up on the significant number of screens that were missed during the lockdown periods⁹. This situation presents a further risk to achieving equitable screening outcomes. Because Māori women had lower coverage pre-COVID, and are more likely than non-Māori to be diagnosed with breast cancer when screened, the impact of halting screening during lockdowns could have a differential impact on Māori breast cancer mortality and morbidity, potentially reducing the proportions of small and node-negative cancers detected by BSA or increased interval cancers. The August 2020 COVID outbreak in the Auckland region could have a similar impact on Pacific screening outcomes.

On the other hand, the COVID recovery provides an opportunity to strengthen an equity-positive approach. BSA has provided guidance to LPs to **prioritise** Māori women ahead of non-Māori women when inviting women to screen, followed by Pacific women. Unscreened women are also prioritised ahead of women returning to routine screening. Unscreened women have a higher chance of being diagnosed with cancer on their first screen since the cancers have had longer to develop. Māori women having initial screens have particularly high rates of cancer detection. Since false positive rates are also higher for women having a first screen, the impact on assessment clinic capacity needs managing.

Medical Imaging Technologist (MIT) capacity is one of the rate-limiting factors for accelerating screening. Any increases in Pandemic Alert Levels that require physical distancing and extra cleaning also slows down screening throughput. New staff may therefore need to be recruited to support the recovery with extra screening hours and assessment clinics. Cultural safety training and monitoring will need to be integrated into recruitment and induction processes to ensure Māori and Pacific women have optimal screening experiences. As stated in the Ministry of Health's Whakamaua: Māori Health Action Plan 2020-2025¹⁰, achieving equity and eliminating discrimination involves “embedding cultural safety and a commitment by all individuals and organisations working across the health and disability system to acknowledge and address their own biases, attitudes, assumptions, stereotypes, prejudices, structures and characteristics that may affect access to adequate health care and the quality of the care provided.”

The Māori Affairs Select Committee¹¹ also recommended “to the Government that it take measures to increase the number of Māori working in the health and disability system.” (recommendation 14) and “that healthcare workers (and supporting staff) are required to undergo comprehensive training to ensure they are culturally capable to treat Māori (recommendation 16)

⁹ Ministry of Health. 2020. BreastScreen Aotearoa DHB Coverage Report. September 2020. <https://minhealthnz.shinyapps.io/nsu-bsa-coverage-dhb/>

¹⁰ Ministry of Health. 2020. Whakamaua: Māori Health Action Plan 2020-2025. Wellington Ministry of Health. <https://www.health.govt.nz/our-work/populations/Māori-health/whakamaua-Māori-health-action-plan-2020-2025>

¹¹ Māori Affairs Committee. 2020. Inquiry into Health Inequities for Māori: Report of the Māori Affairs Committee. Fifty-second Parliament. (Rino Tirikatene Chair) August 2020 https://www.parliament.nz/resource/en-NZ/SCR_100072/fbcffc6f0b843cb0adcbe1cbbe29fcb45b1f1d48

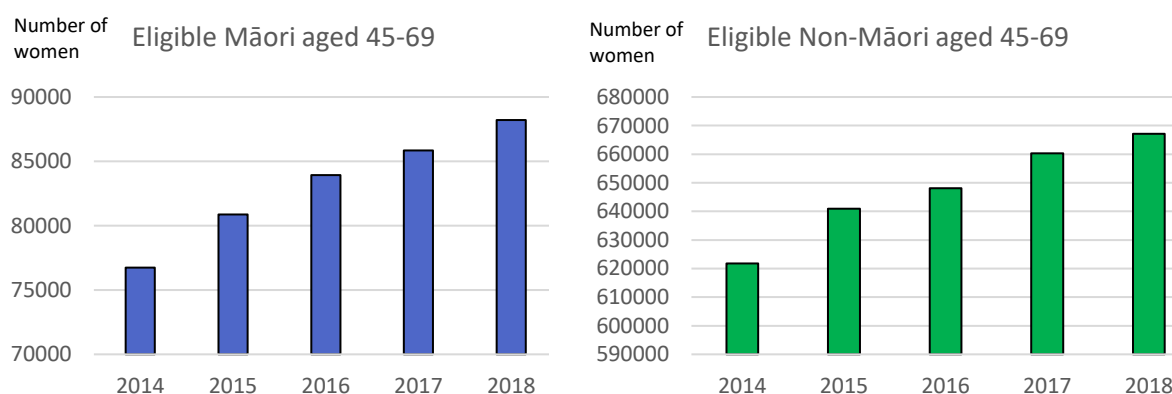
and “undergo accredited cultural safety training as part of their professional development” (recommendations 17).

The Waitangi Tribunal Inquiry into Health services and Outcomes (WAI 2575) is likely to focus on cancer outcomes for Māori in 2021, bringing screening into focus. Tiriti o Waitangi obligations go beyond remedying disadvantage and need to be carefully considered by BSA and the NSU in its planning going forward. The Māori Affairs Committee report hearing that the Cancer Action Plan “will undertake specific actions to ensure equitable outcomes for tangata whenua and will ensure that tangata whenua world views, values, and wairuatanga (spirituality) inform its work.” (P.49). The partnership principle brings potential for new approaches to screening strategy and delivery including those that are Māori owned, led, governed, managed, and implemented, designed by Māori to benefit all.

IS BSA MAKING A DIFFERENCE?

- BSA is meeting its goals for early detection and treatment of breast cancers among screened women but not its goals for equitable screening coverage and timely rescreening.
- More than half of the invasive breast cancers detected by BSA were detected while they were still small among women aged 45–49 and 50–69 years and most had no nodal involvement. 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 recruitment 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 similar coverage to non-Māori non-Pacific women, and similar rates of small cancers detected from subsequent screens.
- Although younger women have lower detection rates, reflecting the lower underlying incidence, the proportions of screen detected cancers that are small are close to those of older women.
- 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.
- The programme aims to minimise harm by keeping false positive rates and open biopsy rates as low as possible. These were within the target range for this period.
- Progress was made in timely rescreening rates for Pacific women, with small improvements for Māori women. Inequities in these rates need to be addressed since they may affect future rates of small cancer detection and interval cancer rates, particularly in the COVID recovery era.

Figure 2: Trends in the population of women eligible for screening by BSA



The number of women eligible for breast screening continues to grow substantially (Figure 4). This has the potential to put stress on BSA’s programme capacity, as LPs need to plan for increasing numbers of eligible Māori and Pacific women at the same time as working towards equitable coverage. Nevertheless, BSA continues to provide a high-quality service to women, meeting key goals of detecting cancers early and minimising harms from unnecessary procedures. Early detection and prompt diagnosis are key to reducing ethnic disparities in survival from breast

cancer.¹² Treatment received by women diagnosed by BSA is generally similar for Māori, Pacific, and other women.

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.

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). Over 70% had no nodal involvement. 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.

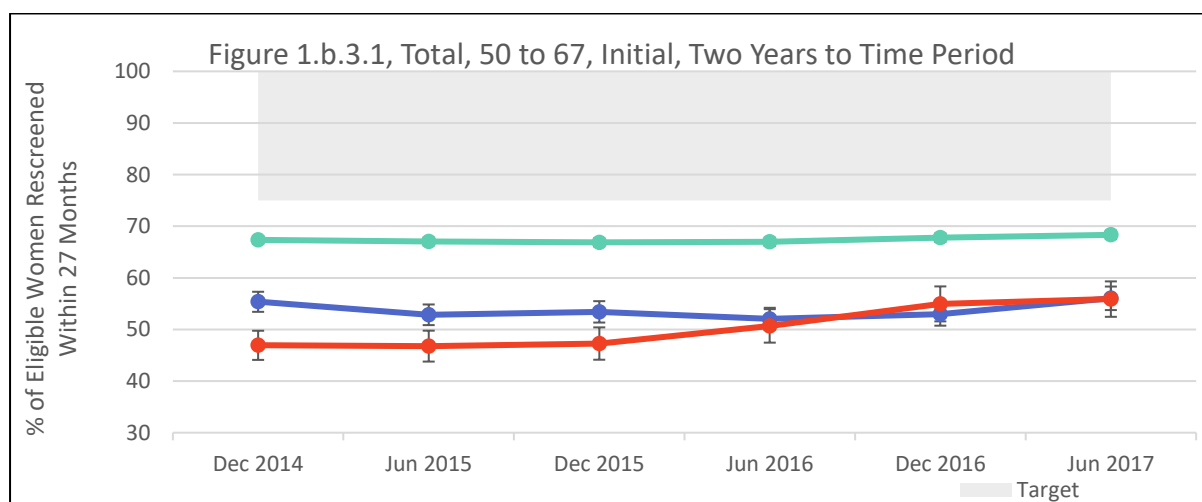
Minimising harms

High quality screening programmes aim to minimise any harms from screening, since well women are invited to participate in an intervention. Possible harms include unnecessary procedures and surgery from false positive screens, 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; false positive rates are on target; 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.

Continuing low proportions of women receiving timely open biopsies and timely surgical treatment are of concern, since they heighten anxiety levels for some women and potentially affect outcomes.

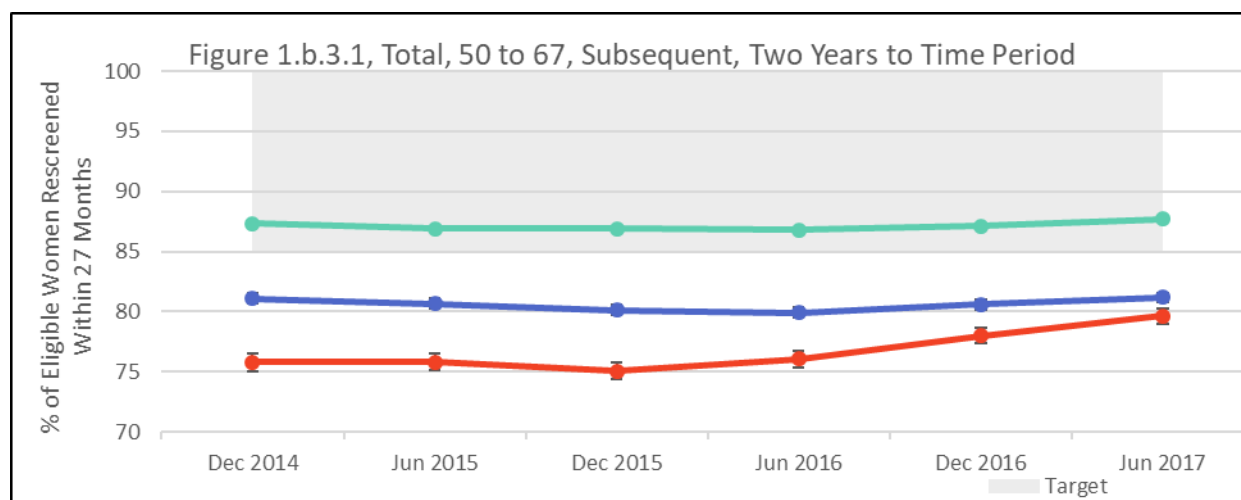
Figure 3: Trends in the proportion of women rescreened within 27 months of an initial screen



Key: Green is non-Māori non-Pacific, Blue is Māori, Red is Pacific women. Target ≥75%

¹² Tin Tin et al. Ethnic disparities in breast cancer survival in New Zealand: which factors contribute? BMC Cancer (2018) 18:58 DOI 10.1186/s12885-017-3797-0

Figure 4: Trends in the proportion of women rescreened within 27 months of a subsequent screen



Key: Green is non-Māori non-Pacific, Blue is Māori, Red is Pacific women. Target $\geq 85\%$

The effectiveness of mammography screening depends on regular screening within the recommended screening interval. It is positive to see upward trends in the proportions of Pacific women being rescreened within 27 months of an initial and a subsequent screen, and small increases for Māori women (Figures 3 and 4). Building on these gains to accelerate timely rescreening rates will be even more important as BSA moves forward in the COVID era that necessitates effective prioritisation and resourcing to ‘recover’ the missed breast screens during the 2020 COVID-10 Pandemic Alert Levels 3 and 4.

In summary, despite the growth in the eligible population over time, 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. The Pandemic recovery provides an opportunity to reset towards equity. Reprioritising resources to increase coverage and recruitment of Māori women, particularly in BreastScreen Midland; increase coverage of Pacific women in five regions; and improve timely rescreening rates for Māori and Pacific women, are essential to enhance the programme’s effectiveness and contribution to equitable outcomes from breast cancer for women in Aotearoa. Professional development in cultural safety will be important as new MITs and other screening workforces are recruited to support the extra demands of recovering from the Pandemic. It is also pressing for BSA to consider Tiriti o Waitangi obligations within the context of the Waitangi Tribunal Hauora Inquiry, the Health Systems Review, the Ministry of Health’s Māori Health Strategy, Te Aho o te Kahu’s partnership with Hei Ahuru Mōwai (the Māori Cancer Leadership Group), and the New Zealand Cancer Action Plan.

RECOMMENDATIONS FROM THE BSA ADVISORY GROUP

1. Urgently implement a population based opt-off breast screening register for women aged 45 years and over, including an option to self-enrol. Women who opt off should have the option to re-enrol in the future.
2. Investigate the reasons for the declining trend in women receiving radiation therapy after breast conserving surgery for invasive breast cancer.
3. Implement the new contracting for equity funding model.
4. Support understanding of equity and cultural safety training within the screening workforce and promote the prioritisation guidance to screen Māori and Pacific women first, and unscreened women before rescreens (since unscreened women are more likely to have a breast cancer detected and therefore benefit more from screening).
5. Consider how to support LPs capability in data matching and analysis for continuous quality improvement, especially in screening coverage equity.
6. Consider and mitigate the equity implications of introducing vacuum assisted excisions which may not be as easily accessible to women living outside main centres.
7. Develop a strategy to increase the Māori workforce across all aspects of breast screening, including leadership roles.
8. Support Lead Providers to strengthen relationships with Māori communities, iwi, and organisations.

Note the new population projections that indicate the current report underestimates the eligible Māori population.