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The authors are based at Cancer Research Division at Cancer Council NSW, Sydney, Australia. They are part of a research group (led by Prof Karen Canfell) which has as its core research focus the epidemiology of cervical cancer, cervical screening and human papillomavirus (HPV) vaccination. This research group has established an extensive track record both in research publication and in successful completion of commissioned projects related to national cervical screening programmes in New Zealand, Australia and England. The group has extensive experience in the analysis of descriptive data from cervical cancer screening programmes. The team also has a range of related skills in the analysis of linked datasets, systematic review and meta-analysis, biostatistics, health economics, and advanced statistical modelling techniques.

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1. Executive Summary

Purpose

This report provides data on performance indicators of the National Cervical Screening Programme (NCSP) for the period 1 January to 30 June 2018.

Key points on performance/trends

Indicator 1 — Coverage

Indicator 1.1 — Three-year coverage

Target: 80% of eligible women screened within the previous three years.

- Among an estimated 1,291,580 eligible women aged 25-69 years at the end of the monitoring period, 931,546 (72.1%) had a screening test in the previous three years.
- The coverage target was not met nationally (80% of women aged 25-69 years screened in the previous three years).
- The coverage target was not met in any five-year age group.
- No DHBs met the coverage target.
- Nationally, coverage targets were not met for any ethnicity including European/ Other women, Māori, Pacific, or Asian women (78.0%, 61.8%, 68.6%, 59.1% respectively screened within the previous three years).
- Five-year coverage among women aged 25-69 years exceeded 80% in all DHBs, in Pacific and European/ Other women, and in women in all five-year age groups between 30-69 years.

Changes in the estimates of the eligible population (the denominator) between reports has occurred between this and the previous report (see comments section for this indicator in the main body of the report for more information). Caution must therefore be taken when interpreting these results as differences between reports may not be a true reflection of changes in coverage but due to more accurate estimates in the eligible population.

- Differences were seen in three-year coverage among women aged 25-69 years, with a coverage of 72.1% in this report and 74.8% in the previous report. A change in more than one percentage point was seen for all ethnicities except Māori women.
- Three-year coverage has changed by more than one percentage point in each of the 5-year age groups between 20 and 69 years.
- Three-year coverage has not changed by more than one percentage point in any DHB.
- Five-year coverage among women aged 25-69 years was found to be 85.8% in this report and 88.6% in the previous monitoring report.

Screens in women aged less than 20 years

Target: None

- In the three years to 30 June 2018, 5,309 women had a cervical sample taken when they were aged less than 20 years. This is fewer than in the previous monitoring period (5,682 women).
- This represents 0.6% of all women (of any age) who were screened in the three-year period (which is similar to the previous monitoring period, 0.5%).
- Most of these women (89.4%) were aged 18-19 years at the time of their cervical sample.

Indicator 1.2

Regularity of screening

Target: Not yet defined

This indicator is assessed annually, in the report that relates to the second half of each calendar year, and so is not assessed in this report. This indicator was last assessed in Report 48 and will be next assessed in Report 50.

Indicator 2

First screening events

Target: None

- There were 23,911 women who had their first screening event during the current monitoring period – an increase compared to the previous monitoring period.
- First screening events generally occur among young women (median age 26 years).
- Asian women appear to have their first screening event at a later age (median age of Asian women attending for their first screening event was 31 years).
- The proportion of women attending for screening who are attending for their first test is highest in Asian women.

Indicator 3

Withdrawal rates

Target: Zero between ages 20-69 years

- There were 22 women aged between 20-69 years who withdrew from the NCSP Register during this six-month period. This is similar to the number of women in this age range who withdrew during the previous monitoring period (20 women).

Indicator 4

Early re-screening

Target: Not yet defined

Currently reporting on the percentage of women in routine screening (previous smear negative and recommended to return in 36 months (3

years)) who returned for a smear within 30 months (2.5 years) of their index smear.

- 12.1% of a cohort of women with a recommendation to return at the routine interval had at least one cytology sample within 30 months of their index cytology sample.
- Early re-screening varies widely between DHBs, from 6.5% in West Coast to 16.7% in Wairarapa.
- Early re-screening occurs in all ethnic groups but is most common among European/ Other (12.5%) and least common among Pacific women (8.4%).
- Early re-screening occurs in all age groups but is most common in women aged 20-24 years at the end of the period (15.9%) and least common in women aged 65-69 years at the end of the period (7.7%).
- Early re-screening has decreased slightly overall since the previous report, from 12.6% to 12.1%.

Indicator 5 Laboratory Indicators

Indicator 5.1 Cytology reporting

Unsatisfactory cytology

Target: 0.1% - 3% for LBC

- The target for the percentage of LBC samples reported as unsatisfactory was met by five of the six laboratories and was met nationally (1.3%).
- The rate of unsatisfactory LBC samples is similar to that in the previous report (1.4%).

Negative cytology

Target: No more than 96% of satisfactory cytology samples

- The target for the percent of samples reported as negative was met nationally (93.3%) and met in all six laboratories.
- Nationally, the percent of samples which are negative (93.3%) is similar to what was reported in the previous period (93.5%).

Abnormal cytology

Target: No more than 10% of satisfactory cytology samples

- The target for the percent of samples reported as abnormal was met nationally (6.7%) and by four of six laboratories.
- Nationally, the percent of samples which are abnormal (6.7%) is similar to what was reported in the previous period (6.5%).

HSIL cytology

Target: No less than 0.5% of satisfactory cytology samples

- The target for the percent of HSIL samples was met nationally and met by all six laboratories.

- Nationally the percent of HSIL samples (0.8%) was slightly higher than in the last monitoring report (0.7%).
- In women aged 20-24 years the rate of HSIL samples is again lower than has ever been previously reported.

Indicator 5.2 Cytology positive predictive value

An updated method was used in the current report that excluded high grade cytology samples collected at a colposcopy visit from this indicator. Results from this updated method are not directly comparable to those derived via the original method in previous reports for trends reporting.

HSIL + SC

Target: 65% - 85% of HSIL+SC cytology samples should be histologically confirmed as high-grade

- Five of six laboratories met the target range for HSIL + SC.
- Nationally, the positive predictive value of HSIL + SC is 80.2%, and ranges across laboratories from 77.4% to 85.9%.
- When results derived using the original method (not excluding cytology collected at colposcopy) are compared with previous reports, the positive predictive value of HSIL + SC was higher in this monitoring period than in the previous report.

Other cytological abnormalities

Target: None

- Nationally, the positive predictive value of ASC-H is 55.4%, and ranges across laboratories from 53.2% to 62.7%.
- Nationally, the positive predictive value of the combination of ASC-H + HSIL + SC is 70.5%, and ranges across laboratories from 62.2% to 74.1%.
- Nationally, the percent of glandular cytological abnormalities identified as histological high-grade is 50.0% (however this measure is generally based on a comparatively small number of samples; 156 samples with histology in the current report).
- When results derived using the original method (not excluding cytology collected at colposcopy) are compared with previous reports, the positive predictive values of ASC-H, the combination of ASC-H + HSIL + SC, and for glandular abnormalities have all increased.

Indicator 5.3 Accuracy of negative cytology reports

Among cytology slides within the 42 months preceding a histological diagnosis of high-grade/ invasive disease originally reported as negative, benign/ reactive or unsatisfactory:

Target: Not more than 10% identified as HS1, HS2, SC, AIS or AC1-AC5 (HSIL+) on review

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Data for this indicator is provided annually and so this indicator is reported annually (in the report that relates to the second half of each calendar year) and is not assessed in this report. This indicator was last assessed in Report 48 and will be next assessed in Report 50.

Indicator 5.4 Histology reporting

Target: None

- 12,467 histology samples were taken during the current monitoring period. 431 (3.5%) of these were insufficient for diagnosis.
- Results for most severe histology from 10,553 women with samples which were sufficient for diagnosis are presented.
- 56.1% of women had histology samples which were negative/ benign. This reduced to 45.1% of women when negative/ benign hysterectomy samples (total hysterectomy and partial hysterectomy with cervical component) were excluded.
- 19.4% of women had CIN 2/3 or HSIL histology results.
- 67 (0.63%) women had histology results indicating adenocarcinoma in situ (AIS).
- 51 (0.48%) women had invasive squamous cell carcinoma (ISCC) histology results, 39 (0.37%) women had adenocarcinomas not arising from the endocervix and four women (<0.05%) adenocarcinoma arising from the endocervix histology results. Two women (<0.05%) had adenosquamous carcinoma histology results.

Indicator 5.5 Turnaround times

Cytology

Target: 90% within seven working days; 98% within 15 working days

- The seven-working-days target for cytology was met nationally (94.9%) and was met by four of six laboratories.
- The 15-working-days target was met nationally (99.0%) and was also met in all six laboratories.
- Performance against the seven-working-days target is lower when compared to the previous report (96.3% to 94.9% in the current monitoring period).
- The overall percent of cytology samples reported within 15-working-days (99.0%) is similar to the previous monitoring period (99.2%).

Histology

Target: 90% within 10 working days; 98% within 15 working days

- Turnaround time target for histology was met nationally for reporting within 10 working days (92.3%).
- The target was not met for reporting within 15 working days (96.9%).
- Targets were met by eight of 14 laboratories (10-working-day target) and five of 14 laboratories (15-working-day target).

- The overall proportion of histology samples reported within 15 days (96.9%) was similar to what was reported in the previous report (97.2%).

Low-grade cytology with associated HPV triage testing

Target: 98% within 15 working days

- There were 3,063 cytology samples with associated HPV triage testing in the current monitoring period.
- The 15-working-days target for turnaround time for cytology with associated HPV triage testing was met nationally (99.3%).
- Four of the six laboratories met the target.

Indicator 6

Follow-up of women with high -grade cytology – histology

Histological follow-up

Target: 90% of women should have a histology report within 90 days of their high-grade cytology report date; 99% should have a histology report within 180 days of their cytology report.

- Targets were not met nationally (for either 90 days or 180 days).
- 84.0% of women had a histology report within 90 days of their high-grade cytology report; 89.1% of women had one within 180 days.
- Three DHBs met the target for histological follow-up within 90 days and no DHBs met the target for 180 days.
- Nationally, the proportion of women with histological follow-up has increased at 90 days (from 83.0% to 84.0%) and at 180 days (from 88.3% to 89.1%) since the previous monitoring period.
- Compared to the previous monitoring period, the proportion of women with follow-up histology within 90 days has increased for Māori women (from 78.9% to 80.3%), Pacific (from 68.6% to 71.1%) and Asian women (from 77.6% to 86.5%). European/ Other women had similar rates between both reports (from 85.7% to 85.4%).
- The proportion of women with follow-up histology within 180 days has increased for Pacific and Asian women and is similar to the previous report for Māori and European/ Other women.

Women with no follow-up tests

Target: None

- Nationally, 140 (8.2%) women have no report of a follow-up test of any kind (colposcopy, subsequent cytology, histology or HPV test) within 90 days of their high-grade cytology report, and 94 (5.5%) women have no follow-up test report within 180 days.
- Nationally, the proportion of women with no record of a follow-up test report at 90 days (from 8.5% to 8.2%) and for 180 days (from 5.7% to 5.5%) were similar over the last two reports.
- Compared to the previous monitoring period, the proportion of women with no follow-up test recorded at 180 days has increased for Pacific (from 10.5% to 12.0%) and Asian women (from 7.1% to 8.2%),

decreased for Māori women (from 9.5% to 8.2%) and remained similar for European/ Other women (from 4.3% to 4.1%).

Indicator 7 Colposcopy

Indicator 7.1 Timeliness of colposcopic assessment – high -grade cytology

Target: 95% or more of women who have evidence of clinical suspicion of invasive carcinoma, or a suspicion of invasive disease (TBS codes HS2, SC, AC1-AC5), receive colposcopy or a gynaecological assessment within 10 working days of receipt of referral. 95% or more of women who have other high-grade smear abnormalities (TBS codes ASH, HS1, AG1-AG5, AIS) receive colposcopy within 20 working days of receipt of referral.

- There were 1,706 women with high-grade cytology results who were not already under specialist management (the same women reported on in Indicator 6).
- This comprised 43 women with high-grade results indicating a suspicion of invasive disease and 1,663 women with other high-grade results.
- Nationally, the proportion of women with accepted referrals recorded on the NCSP Register (90.2%) is similar to the previous report (88.2%).

Suspicion of Invasive Disease

- Among the 43 women with high-grade cytology results indicating a suspicion of invasive disease, 30 (69.8%) had an accepted referral. Of the women with an accepted referral, 83.3% were seen within 10 working days of their referral being accepted. This is higher than in the previous report (65.0%).
- A colposcopy visit was recorded for 41 (95.3%) of these women as of 30 June 2018 (follow-up time of at least six and up to 12 months).

No Suspicion of Invasive Disease

- Among the 1,663 women with other high-grade cytology results, 1,509 (90.7%) had an accepted referral. Of the women with an accepted referral, 75.7% were seen within 20 working days of their referral being accepted. This is similar to the proportion seen within 20 working days in the previous monitoring period (75.6%).
- A colposcopy visit is recorded for 1,576 (94.8%) of these women as of 30 June 2018 (follow-up time of at least six and up to 12 months).

Indicator 7.2 Timeliness of colposcopic assessment – low-grade cytology

Target: 95% of women who have persistent low-grade abnormalities or a low-grade abnormality and positive HPV test, must receive a date for a colposcopy appointment within a period that does not exceed 26 weeks of the colposcopy unit accepting the referral from the sample taker.

- There were 3,488 women with persistent low-grade cytology or low-grade cytology and a positive hrHPV test collected (the 6-month period ending 12 months prior to the end of the current monitoring period, i.e. between 1 January – 30 June 2017).
- Subsequent accepted referrals are recorded for 3,017 (86.5%) of these women, and subsequent colposcopy (by 30 June 2018) for 3,198 (91.7%) of these women.
- Nationally, 88.8% of women attended for colposcopy within 26 weeks of their accepted referral. This is higher than in the previous monitoring report (85.1%).

Indicator 7.3 Adequacy of reporting colposcopy

Target: 100% of medical notes will accurately record colposcopic findings including visibility of the squamo-columnar junction, presence or absence of a visible lesion, and colposcopic opinion regarding the nature of the abnormality.

- Based on 12,198 colposcopy visits in the current monitoring period recorded on the NCSP Register, no DHB nor the aggregate of colposcopy visits to private practice met the target of 100% completion of all recommended fields.
- All items (degree of visibility of the squamo-columnar junction, presence or absence of a lesion and colposcopic opinion regarding abnormality) were documented for 92.6% of colposcopy visits.
- The type of recommended follow-up was recorded for 95.6% of colposcopy visits, and the recommended timeframe for this follow-up was recorded for 94.9% of colposcopy visits.
- Colposcopic appearance was reported as abnormal in 54.0% of colposcopies, and inconclusive in 4.9% of colposcopies.
- Completion of most recommended fields is broadly similar to what was reported in the previous monitoring period.
- Overall completion is similar in this monitoring period (92.6%) to the previous monitoring period (92.2%).
- The number of colposcopies recorded on the NCSP Register was similar to what had been reported in the previous report (0.7% increase).
- All DHBs were reporting colposcopy data electronically to the NCSP Register throughout the current monitoring period.

Indicator 7.4 Timeliness and appropriateness of treatment

Target: 90% or more of women with HSIL should be treated within eight weeks of histological confirmation.

- 63.8% of 2,130 women with HSIL (CIN 2/3) histology during the period 1 July to 31 December 2017 have a record of treatment within eight weeks of their histology report.
- The proportion of women with histologically-confirmed CIN 2/3 who were treated within eight weeks of their histology result being

reported (63.8%) was similar to the previous monitoring period (63.2%).
- One DHB met the target.

Indicator 7.5 Timeliness of discharge following treatment

Target: 90% or more of women treated for CIN 2/3 should have a colposcopy and cytology within the nine-month period post treatment.

- Based on NCSP Register records, 1,392 women were treated for high-grade lesions in the period 1 January to 30 June 2017.
- 76.4% of women treated have a record of both colposcopy and cytology within the nine months after their treatment visit. 77.5% have a record of at least a colposcopy visit (with or without cytology) in the same time period.
- One DHB met the target for follow-up within nine months post-treatment.

Target: 90% or more of women treated for CIN 2/3 should be discharged back to the sample taker as appropriate.

- There were 1,021 women who were eligible for appropriate discharge within 12 months of their treatment (73.3% of all women treated for CIN 2/3). Of these women, 879 (86.1%) were discharged to their sample taker within 12 months.
- Ten DHBs met the target of discharging 90% or more women who were eligible for discharge within 12 months.

Indicator 8 HPV testing

Indicator 8.1 HPV triage of low -grade cytology

Target: None set.

HPV triage

- Nationally, 97.3% of women aged 30 years or more with an eligible ASC-US cytology result, and 96.7% of women aged 30 years or more with an eligible LSIL cytology result, are recorded as having a subsequent HPV triage test.
- Small numbers of HPV triage tests occur in women aged under 30 years (in 1.0% of women with an ASC-US result, and 0.6% of women with an LSIL result; 22 women in total).
- The proportion of women aged 30 years and over who were eligible for HPV triage of low-grade cytology who subsequently received a triage test is similar in the previous monitoring period for women with ASC-US results (97.3%, compared to 97.4% in the previous report) and for women with LSIL results (96.7%, compared to 97.6% in the previous report).

Positive triage tests

- Among women aged 30 years or more with a valid HPV triage test results, 24.5% of women with ASC-US results and 58.5% of women with LSIL results were positive for high risk HPV.
- Positivity for high risk HPV varied by laboratory (from 13.5% to 29.7% for ASC-US, and from 38.5% to 67.1% for LSIL).
- Positivity for high risk HPV generally decreased with increasing age.
- The proportion of women whose HPV tests were positive decreased compared to the previous monitoring period for ASC-US (24.5%, compared to 25.5% in the previous period), and LSIL (58.5%, compared to 60.1%, in the previous period).

Histological outcomes in triage-positive women who attended colposcopy

- Among women with ASC-US cytology and a positive HPV triage test in the six-month period one year prior to the current monitoring period, 95.4% of women have a record of colposcopy and 63.5% have a record of histology within 12 months of their triage test. The corresponding percentages for LSIL are 91.5% with colposcopy and 67.0% with histology within 12 months.
- Among women with colposcopy recorded within 12 months of a positive triage test, the proportion of women that had a CIN 2 or more severe outcome (CIN 2+) was 15.3% for women with ASC-US cytology and 14.1% for women with LSIL cytology. This corresponded to 48 of the women with ASC-US cytology and 103 of the women with LSIL cytology.
- Among women with histology recorded within 12 months of a triage test, 23.0% of women with ASC-US cytology and 19.3% of women with LSIL cytology had a histological outcome of CIN 2+.

Indicator 8.2 <u>HPV test volumes</u>

Target: None set.

- Nationally, there were 18,302 cervical samples received at laboratories for HPV testing during the current monitoring period.
- Nationally, 14.7% of HPV tests were taken for follow-up of women treated for confirmed high-grade squamous abnormalities in the previous four years (post-treatment follow-up), 36.6% were taken to manage women with high-grade squamous cytology or histology more than three years ago (historical testing), 7.6% were taken at colposcopy (potentially to assist in resolving discordant results), and 15.7% were taken for HPV triage of low-grade cytology in women aged 30 years or more. The remaining 25.4% of HPV tests did not fit into any of the previously described categories, and so the reason for testing was unclear.
- The proportion of HPV tests which are invalid is very small (0.07%).
- Overall HPV test volumes have been similar between the last two reports with a 0.4% increase since the previous monitoring period.

Indicator 8.3	Historical HPV tests for follow-up of women with previous high-grade abnormality Target: None set. • This analysis followed up 49,193 women who were eligible for historical HPV testing as at 1 October 2009 to ascertain how many women had received an HPV test for management of their historical (more than three years prior) high-grade squamous abnormality. • There were 33,472 women (68.0%) with a Round 1 historical HPV test recorded, and 28,102 women (57.1%) with a Round 2 historical HPV test recorded. • The proportion of women who had received a historical HPV test varied by DHB, from 56.3% to 79.8% for Round 1 tests and from 43.5% to 72.5% for Round 2 tests. • For women aged 25 to 69 years this varied from 43.2% (25-29 years) to 71.0% (60-64 years) for Round 1 tests, and from 37.8% (25-29 years) to 61.1% (60-64 years) for Round 2 tests. • The proportion of women who had received a historical HPV test varied somewhat by ethnicity, from 48.4% (Pacific women) to 70.1% (European/ Other women) for Round 1 tests and from 37.9% (Pacific women) to 59.8% (European/ Other women) for Round 2 tests. • The proportion of eligible women with an HPV test recorded has increased since the previous report from 66.5% to 68.0% for Round 1 tests, and from 54.8% to 57.1% for Round 2 tests.

2. Background

An organised National Cervical Screening Programme (NCSP) was established in New Zealand in 1990, to reduce the number of women who develop cervical cancer and the number who die from it. The Programme recommends regular cervical screening at three-year intervals for women aged between 20 and 69 years who have ever been sexually active. Part 4A of the Health Act 1956, which came into effect in 2005, underpins the NCSP's operations to ensure the co-ordination of a high-quality screening programme for all women in New Zealand.

Ongoing systematic monitoring is a requirement of an organised screening programme. Such monitoring allows the performance of the Programme to be evaluated and corrective action to be taken as required. Monitoring is carried out through a set of key indicators which cover all aspects of the screening pathway, including participation by women, their clinical outcomes, NCSP provider performance and the Programme overall.

Monitoring reports were produced quarterly from December 2000 to June 2007 (Report 27); and six-monthly thereafter. The audience for these monitoring reports includes the general public, NCSP providers, and the Programme itself.

Technical information on the indicators are available from the Ministry of Health on request.

From Report 30 (July-December 2008) onwards, monitoring has been undertaken with the technical assistance of researchers based at the Cancer Research Division at Cancer Council NSW, Sydney, Australia. This has coincided with the use of a new reporting format, incorporating more explicit definitions and utilising data from the newly developed NCSP Register, so earlier reports are not fully comparable with Report 30 onwards.

The development of these reports has been ongoing, however it is anticipated that from Report 44 going forward, there will be minimal further changes until the NCSP transitions to primary HPV screening in the near future.

NCSP biannual monitoring reports are reviewed by a multidisciplinary advisory and monitoring group, representing NCSP providers and consumers. The group may make recommendations to the NSU for follow-up actions.

Further information about the NCSP Advisory Group and the monitoring and performance of the NCSP is available on https://www.nsu.govt.nz/health-professionals/national-cervical-screening-programme/independent-monitoring-reports and on request from the NCSP:
Email: Ivan_Rowe@moh.govt.nz
Phone: (04) 816 3345, 021 711 432 or Fax: (04) 816 4484

3. Methods

Data used

The analyses in this report are based on data extracted from the NCSP Register on 17 August 2018.

Age

Unless otherwise specified, age is defined as the woman's age at the end of the monitoring period, i.e. the women's age at 30 June 2018.

Hysterectomy-adjusted population

Measures such as coverage require an estimate of the population eligible for cervical screening. This is approximated by applying a hysterectomy-adjustment to the estimated New Zealand female population, to exclude women with a hysterectomy from the eligible population. This is an imperfect adjustor of the proportion of the population eligible for screening, since women with a hysterectomy may or may not require further cervical smears, depending on the type of hysterectomy that they received.

The hysterectomy-adjustment used in this report uses estimates of the hysterectomy prevalence in the New Zealand population from Cleary and Wright.[1] Cleary and Wright used similar modelling techniques to those used by Gray[2] to provide hysterectomy estimates used in previous monitoring reports. Alterations to the methods used by Gray[2] include: slight modifications to the model used; additional procedure data and procedure codes were included (to include previously overlooked procedures where the cervix is removed, but did not include sub-total hysterectomies which leave part of the cervix intact); and attempts to account for mortality and migration. Hysterectomy incidence was estimated by fitting models to observed data on hysterectomies obtained from public and private hospital discharge data from the National Minimum Dataset and the Mortality collection and applied these incidence estimates to estimates of the usually resident female population from Statistics New Zealand. The New Zealand Health Survey was used to calibrate the estimates. The resulting estimates of hysterectomy incidence and survival in single-year age groups by calendar year were then used to estimate the prevalence of hysterectomy by five-year age group (among women aged 20-69 years) and calendar year (1957 to 2018). The 30 June 2018 estimates that were employed in this monitoring report have been updated to include actual hysterectomy data to 31 December 2016 (supplemented by New Zealand Health Survey data) in five-year age groups to better reflect the hysterectomy prevalence in the population, and have been projected forward using similar the methods similar to previously applied. A known limitation of previous estimates of hysterectomy prevalence is that they did not take into account deaths or women who leave New Zealand after they have a hysterectomy (which would tend to result in an overestimate of hysterectomy prevalence), nor women who migrate to New Zealand who have previously had a hysterectomy (which would tend to underestimate hysterectomy prevalence). In these new estimates attempts to account for mortality and migration have been applied, to reduce these limitations. The estimates of hysterectomy prevalence used in the current report are included in an Appendix.

The hysterectomy prevalence data were applied to New Zealand population estimates from Statistics New Zealand so that estimates of the number of women in the New Zealand population (by age and ethnicity) who had not had a hysterectomy prior to 30 June 2018 were obtained. Hysterectomy prevalence figures for the whole population (the denominator) were age-specific hysterectomy adjustments, and were applied equally across the estimated population within each DHB and ethnicity grouping. These adjusted population estimates were then used as the denominator in the hysterectomy-adjusted calculations.

The estimates used for the New Zealand female population (as at 30 June 2018) were also updated in the current report, from projections made in 2016 based on 2013 Census data, to projections made in 2018, also based on 2013 Census data.

Ethnicity analysis

The analysis by ethnicity considered four groups – Māori, Pacific, Asian, or European/ Other, based on women's prioritised ethnicity derived from level two ethnicity codes recorded on the NCSP Register. Women for whom ethnicity information was not available were included in the "European/ Other" ethnicity category. The data download used for the current analysis (NCSP Register data as at mid-August 2018) contained ethnicity codes for approximately 99.1% of women on the NCSP Register.

Ethnicity data in New Zealand is collected during encounters with the health system, such as registering with primary care, during an admission to hospital, or during surveys. The Ministry of Health has undertaken a number of activities to improve the quality of ethnicity data, including the development in 2004 of protocols for the collection and recording of ethnicity data,[2] updated in 2017.[3] Coding of ethnicity on the NCSP Register follows the classification used by the Ministry of Health.[4, 5] The NCSP is continuing with work to improve the accuracy of ethnicity recording on the NCSP Register. This has included matching women's NHIs for which there is no ethnicity on the register with the Ministry of Health's NHI register to include ethnicities. This matching is done every three months.

Calculating NCSP coverage

Revisions to calculations are made in accordance with changes to New Zealand statistics, such as the population census data and ethnicity recordings. These changes reflect Statistics New Zealand modifications to methods for estimating population statistics. Any changes to methods for numerators or denominators are discussed with and supported by the NCSP Advisory Group. These changes are then approved by the National Screening Unit.

In 2008 the NCSP Advisory Group agreed that NCSP report coverage for women aged 25-69 years at the end of the monitoring period. This includes women aged 22 and over at the beginning of the three-year period but excludes women aged 20 or 21 years at the beginning). This approach is consistent with practice in Australia and England. In England, until 2003, the target age range for screening was 20-64 years, but coverage was calculated for women aged 25-64 years, to ensure only women eligible throughout the period were included. Similarly, in Australia, women are eligible to start screening from 18 years, but coverage is measured among women aged 20-69 years. The difference between the starting ages (two years) is the same as the recommended screening interval in Australia.

The advantage of measuring coverage at ages 25-69 are that it provides a fairer estimate of coverage (by excluding women who are not eligible for the full three-year period) and allows international benchmarking with important peer group countries, including Australia and UK.

In addition to three-year coverage, (discussed above) we also report five-year coverage (as is also done internationally). The change in method is even more important here as women aged 20-24 all need to be excluded as they are not eligible for screening for the full five years prior to the end of the assessment period. Restricting the coverage estimate to the 25-69 age group rather than the 20-69 age group is even more advantageous with respect to the five-year coverage indicator than the three-year coverage indicator.

As with all indicators, coverage indicators and the statistics on which they are based continue to evolve and further changes in the construction of these are to be expected in the future.

4. Biannual NCSP Monitoring Indicators

Indicator 1 – Coverage

This indicator includes two sub-indicators – three-year coverage (Indicator 1.1) and regularity of screening (Indicator 1.2). Indicator 1.1 also describes participation at longer intervals (five-year coverage). These two sub-indicators complement each other, in that the first allows monitoring of women who are screened versus those who are not screened over various timeframes; whereas the second (regularity of screening) allows more detailed monitoring of the timeliness among women who have attended for screening.

This is a re-structure compared to reports prior to Report 44, where only three-year (and five-year) coverage were included in the biannual monitoring reports, and regularity of screening was included in the annual reports.

Indicator 1.2, regularity of screening, is analysed annually to allow for the full year to be examined, and so is only included in every second monitoring report.

Indicator 1.1 – Three-year coverage

Definition

The proportion of all 25-69 year old women who have had a screening event (cytology sample, HPV sample or histology sample) taken in the three years prior to the end of the monitoring period. This definition restricts the measure of coverage to the five-year age groups who were eligible for the entire duration of the three-year period, i.e. women aged 25-69 years at the end of the monitoring period. Screening coverage in women aged 20-69 years is also presented, for comparability with previous reports.

The denominator (eligible population) for this indicator is adjusted for the estimated proportion of women who have had a total hysterectomy. Women who have withdrawn from or are not enrolled on the NCSP Register are excluded from the counts of women screened.

Screening of women aged less than 20 years at the time of their cervical sample is also reported by DHB.

Target

80% of eligible women (aged 25-69 years at the end of the period) within three years.

This target applies nationally, and also to each ethnicity group (80% for Māori, 80% for Asian, 80% for Pacific, 80% for European/ Other women).

Current Situation

Coverage

931,546 (72.1%) women aged 25-69 at the end of the current monitoring period (30 June 2018) had at least one cervical sample taken during the previous three years. This does not yet meet the target of 80%. 1,108,338 (85.8%) women aged 25-69 at the end of the current monitoring period had at least one cervical sample taken during the previous five years.

Three-yearly coverage varied by ethnicity. Coverage targets of 80% were not met for any ethnicity group. Māori, Pacific, Asian women and European/ Other women coverage among women aged 25-69 years was 61.8%, 68.6%, 59.1% and 78.0% respectively (Figure 1, Table 24).

The target coverage of 80% of women screened at least once within the previous three years was not achieved in any of the five-year age groups between 25 and 69 years Among women aged 25-69 years at the end of the period, coverage was lowest for women aged 25-29 years (58.9%) and was highest for women aged 45-49 (78.3%) (Figure 2, Table 25). Coverage was also low for women aged 20-24 years (45.9%), however many women in this age group were not eligible for screening for the entire three-year period, and so the target is not applied to this age group.

Three-yearly coverage in women aged 25-69 years varied by DHB from 67.6% (Auckland) to 78.8% (Taranaki). The three Auckland DHBs have some

of the lowest coverage rates (67.6%, 68.0% and 70.0% in Auckland, Counties Manukau and Waitemata, respectively). No DHBs achieved the 80% target for women aged 25-69 years at the end of the period (Figure 3, Table 23).

Coverage for each of Māori, Pacific, Asian or European/ Other women was also examined at the DHB level (Table 26), and by age group (Table 27).

Three-yearly coverage for Māori women ranged from 52.3% (Auckland) to 71.5% (Hawke's Bay) (Figure 4). The target level of 80% of Māori women screened within the previous three years was not achieved in any DHB. Three-yearly coverage for Pacific women ranged from 53.2% (Northland) to 91.7% of women in South Canterbury (Figure 5). The target level of 80% of Pacific women screened within the previous three years was achieved by three DHBs (Lakes, South Canterbury and Wairarapa). Three-yearly coverage in Asian women ranged from 45.6% (Southern) to 70.4% (Hutt Valley) (Figure 6). The target level of 80% of Asian women screened within the previous three years was not met in any DHB. Three-yearly coverage for European/ Other women ranged from 72.0% (Counties Manukau) to 86.3% (Bay of Plenty) (Figure 7). The target level of 80% of European/ Other women screened within the previous three years was achieved in six DHBs (Auckland, Bay of Plenty, Capital and Coast, Lakes, Southern, Taranaki). No DHB met the 80% target in all four ethnic groups.

Three-yearly coverage for Māori women ranged from 57.6% (25-29 years) to 66.2% (55-59 years) (Figure 8). The target level of 80% of Māori women screened within the previous three years was not achieved in any age group. Three-yearly coverage for Pacific women ranged from 52.7% (25-29 years) to 82.7% of women (60-64 years). The target level of 80% of Pacific women screened within the previous three years was met in one age group (60-64 years). Three-yearly coverage in Asian women ranged from 40.3% (25-29 years) to 66.0% (35-39 years). The target level of 80% of Asian women screened within the previous three years was not met in any age group. Three-yearly coverage for European/ Other women ranged from 66.6% (25-29 years) to 85.0% (35-39 years). The target level of 80% of European/ Other women screened within the previous three years was achieved in five age groups (each of the five-year age groups between ages 35 and 59 years).

When compared to the findings for three-year coverage, five-year coverage had broadly similar patterns of variation by age, DHB, and ethnicity. For women aged 25-69 years at the end of the monitoring period, five-year coverage varied from 81.3% for Auckland to 91.1% for Taranaki (Figure 9, Table 28); by age from 71.8% for women aged 25-29 years to 93.0% for women aged 45-49 years (Figure 10, Table 30) and from 69.5% (Asian) to 91.8% (European/ Other) (Figure 11, Table 29). Five-yearly coverage for Māori women ranged from 65.0% (Auckland) to 90.3% (Hawke's Bay) (Figure 12, Table 31). Five-yearly coverage for Pacific women ranged from 65.2% (Northland) to all women (South Canterbury and Wairarapa) (Figure 13, Table 31). Five-yearly coverage for Asian women ranged from 53.3% (Southern) to 82.7% (Hutt Valley) (Figure 14, Table 31). Five-yearly coverage in European/ Other women ranged from 85.7% (Counties Manukau) to

98.8% (Capital & Coast) (Figure 15, Table 31). Coverage was estimated to be over 100% of the eligible population in some cases (Table 31); this is likely to be due to limitations in the estimates for population and hysterectomy prevalence.

Screens in women aged less than 20 years

In the three years to the 30 June 2018, a total of 5,308 women had a cervical sample taken when they were aged less than 20 years. This represents 0.5% of women who were screened at any age (Table 33).

The number of women who were aged less than 20 years at the time they were screened varied by DHB from 30 (Tairawhiti) to 999 (Canterbury), however some differences in counts are to be expected due to differences in population size and age structure between DHBs. In order to take differences in population size between DHBs into account, the number of women who were screened in the previous three years and aged 15-19 years at the time of their cervical sample in each DHB was divided by the estimated population of females aged 15-19 years in that DHB. Note that as the events occurred over a three-year period, and the population estimate is for a single year, this cannot be interpreted directly as the proportion of 15-19 year old females in each DHB who have been screened in the last three years. However, this does allow the variation in DHB populations to be partly accounted for, and thus can give an indication of where screening among women aged less than 20 years is more or less common. Estimates for this proportion ranged from 1.9% (Tairawhiti) to 5.7% (Canterbury). Some DHBs screen a relatively low number of women when they are younger than 20 years, but at a comparatively high rate, because their population is small (for example West Coast). Details of screens of women aged less than 20 years by DHB are presented in Figure 16, and Table 32 to Table 34.

Further exploratory analysis determined that a very high proportion of the women who were aged less than 20 years at the time of their cervical sample were aged 18-19 years at the time (89.4%; Table 34). This may represent opportunistic screening of women aged 18-19 years. This proportion varied from 83.3% in Tairawhiti to 94.9% in Capital & Coast. Where this proportion is higher, it indicates that a larger proportion of screening in women aged less than 20 years may be attributable to opportunistic screening of women aged 18-19 years; as this proportion decreases, it indicates that more of the screening in women aged under 20 years is occurring in women aged under 18 years, and less may be attributed to opportunistic screening of women aged 18-19 years.

Trends

Coverage

Overall coverage in New Zealand among women aged 25-69 years is lower in the current monitoring report (72.1% within the last three years, and 85.8% within the last five years) compared to the previous monitoring report (74.8% within the last three years, and 88.6% within the last five years). These changes however are likely to be due to changes in the estimates of the eligible population (the denominator) between reports (see *Comments*

section for more information). Caution must therefore be taken when interpreting these results, as in many cases differences between reports are potentially due to more accurate estimates in the eligible population, rather than a true reflection of changes in coverage.

The proportion of Asian women screened was 63.4% in the previous period and 59.1% in the current period. Small differences between reports also exist for Māori (62.0% in the previous report, 61.8% in the current report), European/ Other (80.4% in the previous report, 78.0% in the current report) and Pacific women (73.4% in the previous report, 68.6% in the current report) (Figure 19, Table 39). Caution must be taken when interpreting these results as these changes are likely to be mainly attributed to changes in the eligible population (denominator value).

Trends over the last four monitoring periods are shown by DHB in Figure 17 and Table 37, and by age in Figure 18 and Table 38, however caution must be taken when interpreting these results as these changes are likely to be mainly attributed to changes in the eligible population (denominator value).

Screens in women aged less than 20 years

The number of women screened who were aged under 20 years has decreased from 5,682 in the previous monitoring period to 5,308 in the current monitoring period, with the proportion of all women with screening events who were aged less than 20 years at the time of the event being similar (at 0.5% in both reports). The number of women screened who were aged less than 20 years at the time of their cervical sample has decreased in 18 of the 20 DHBs over the last two monitoring periods (Figure 20).

The proportion of these women who were aged 18-19 years has remained similar to the previous monitoring period (89.4%, compared to 89.7% previously), with small increases occurring in 9 of 20 DHBs (Figure 21).

Comments

Low coverage in women aged 25-34 years is a concern. The transition to screening starting at age 25 years from November 2019 means there is a need for rapid uptake from age 25.

As noted in the *Trends* section, the estimates for the number of women eligible for screening including hysterectomy adjustment were updated in the previous and current report, and this change means that differences in coverage compared to prior reports should be interpreted with caution, as these may partially reflect differences in the population estimates. The estimates of age-specific hysterectomy prevalence used in the current report are included in Appendix A (Table 35). Table 35 also includes a comparison with the hysterectomy prevalence estimates used in the previous monitoring report.

Application of population projection changes from June 2017 to this monitoring period has also resulted in additional differences in estimates for this report compared to all previous reports. These changes not only have an influence on the overall coverage but also at an age, ethnicity and DHB

level. This limits the comparability between this and the previous reports as the majority of the differences are most likely to be due to changes in the denominator (eligible population) rather than changes in the number of women who attend screening. In particular, the updated population projections were higher than earlier projections for Pacific and Asian women, while there were smaller decreases in the estimated population of Māori and European/ Other women.

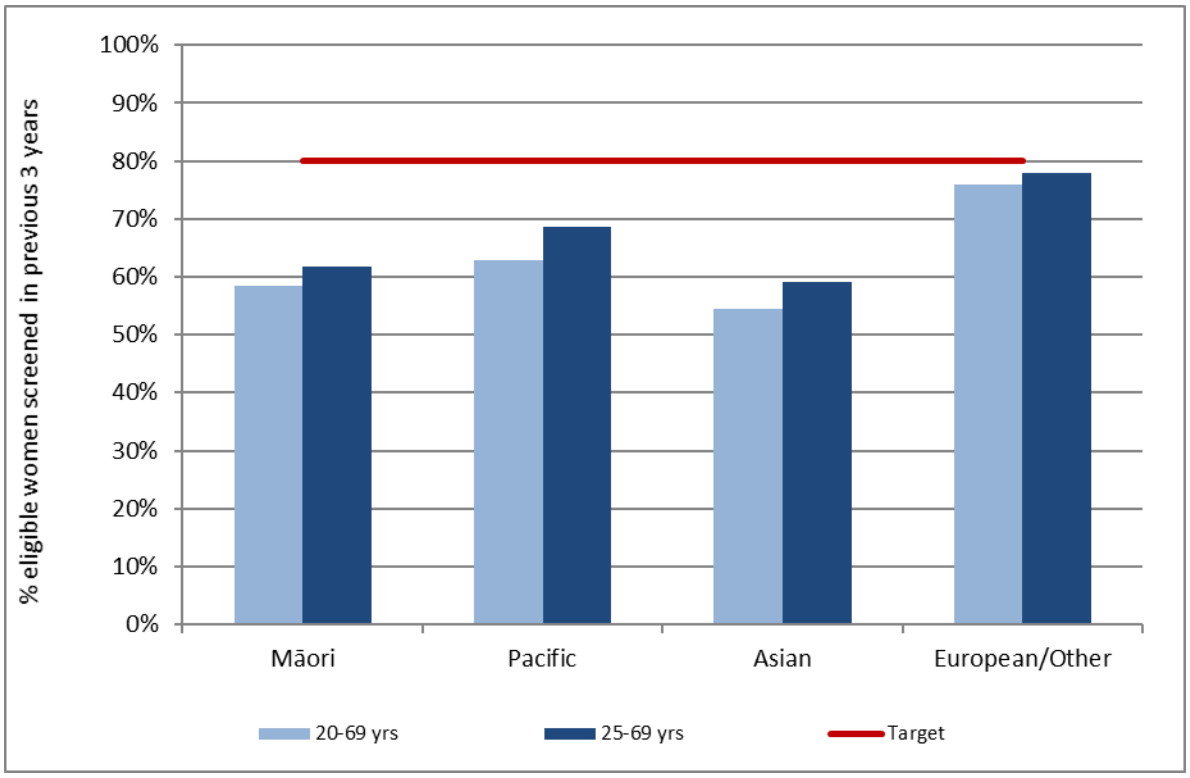
As discussed in the Methods section of this report (*Hysterectomy-adjusted population*; page 29), the hysterectomy prevalence estimates used to make the adjustment includes all women with a total hysterectomy, some of whom may still require screening (for example, where treated with a total hysterectomy for histologically-confirmed cervical high grade). These women will have been removed from the denominator but may still appear in the numerator. As a result of these limitations, coverage must be interpreted with some caution. We explored the impact of the hysterectomy-adjustment on the results by calculating coverage as a proportion of the total New Zealand female population (i.e. regardless of whether they have had a hysterectomy or not). Results for this analysis appear in Table 36.

Counts of women screened used to estimate coverage (numerator) exclude women who are not enrolled on the NCSP Register, whereas the hysterectomy-adjusted population estimates (denominator) represent all women in New Zealand without a hysterectomy, regardless of whether they are enrolled on the NCSP Register. Therefore, the coverage estimates may be an underestimate of the actual coverage rates achieved; however, the impact is likely to be very small.

Concerns about under- and over-counting of different ethnicity groups have led the Ministry to use the NHI for ethnicities as other Ministry collections do. This report relies on NCSP Register ethnicities; however regular matching is done with the NHI register for women on the NCSP Register who have no ethnicity recorded on the NCSP Register.

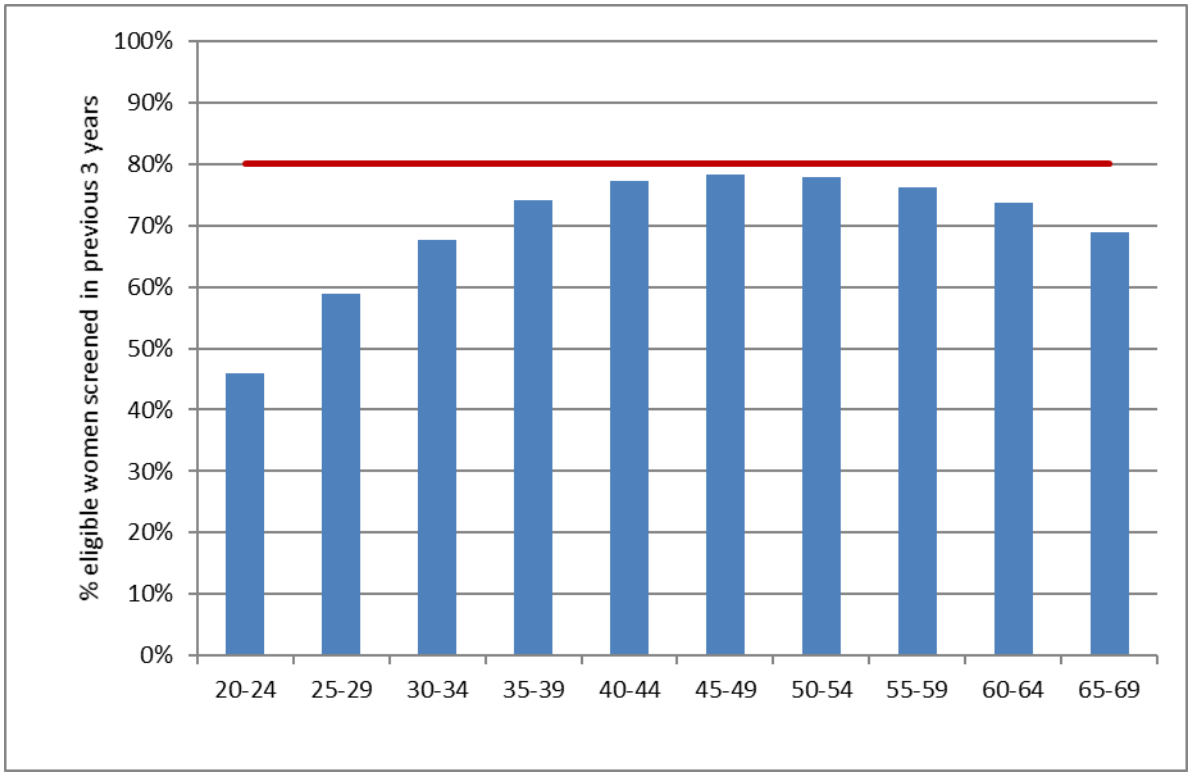
Coverage in women aged 20-24 years is likely to remain lower than for other ages and coverage in this age group should be interpreted with caution, as many women will have had a shorter period in which they were eligible for screening. In 2019, National Cervical Screening Programme will be changing the starting age for cervical screening from 20 to 25 years, based on evidence that screening women between the ages of 20 and 24 provides little benefit to women and can cause harm.[6] This change is in line with the screening start age in many other countries.

Figure 1 - Three-year coverage by ethnicity (women 25-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population)



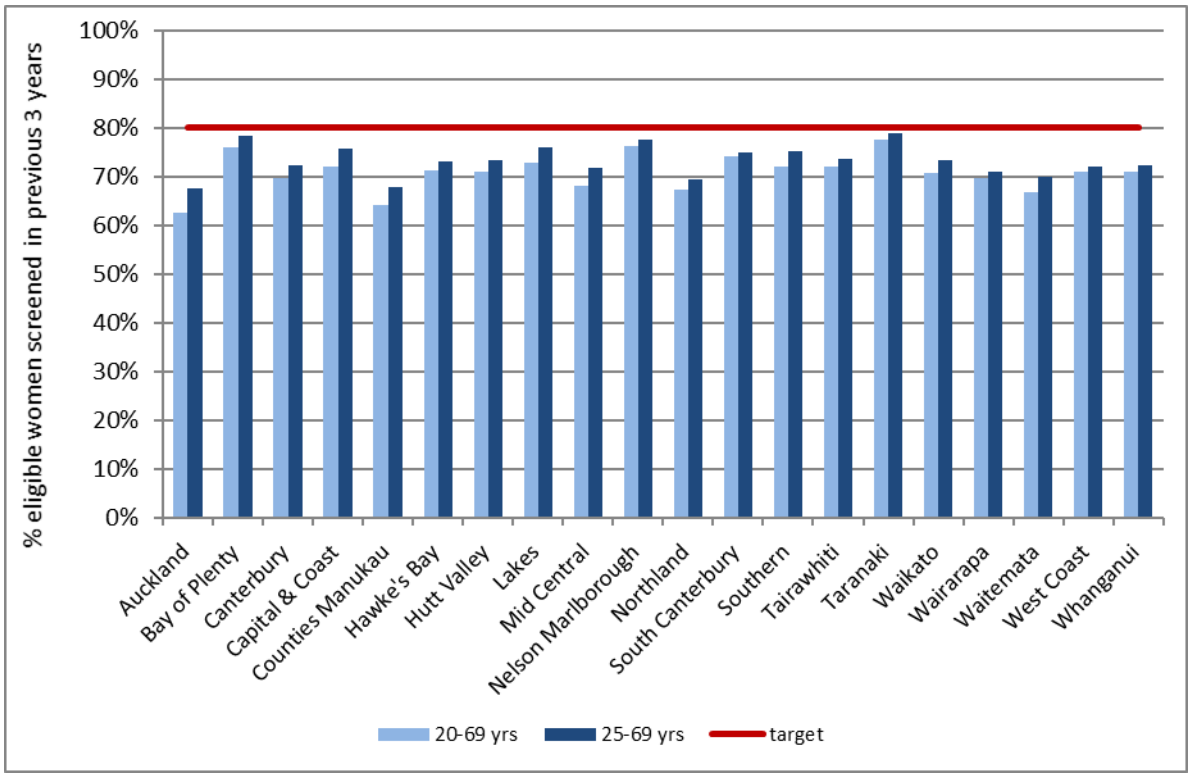
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target: 80% for ages 25-69 years, hysterectomy adjusted. See also Table 24.

Figure 2 - Three-year coverage by five-year age group (women 20-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population)



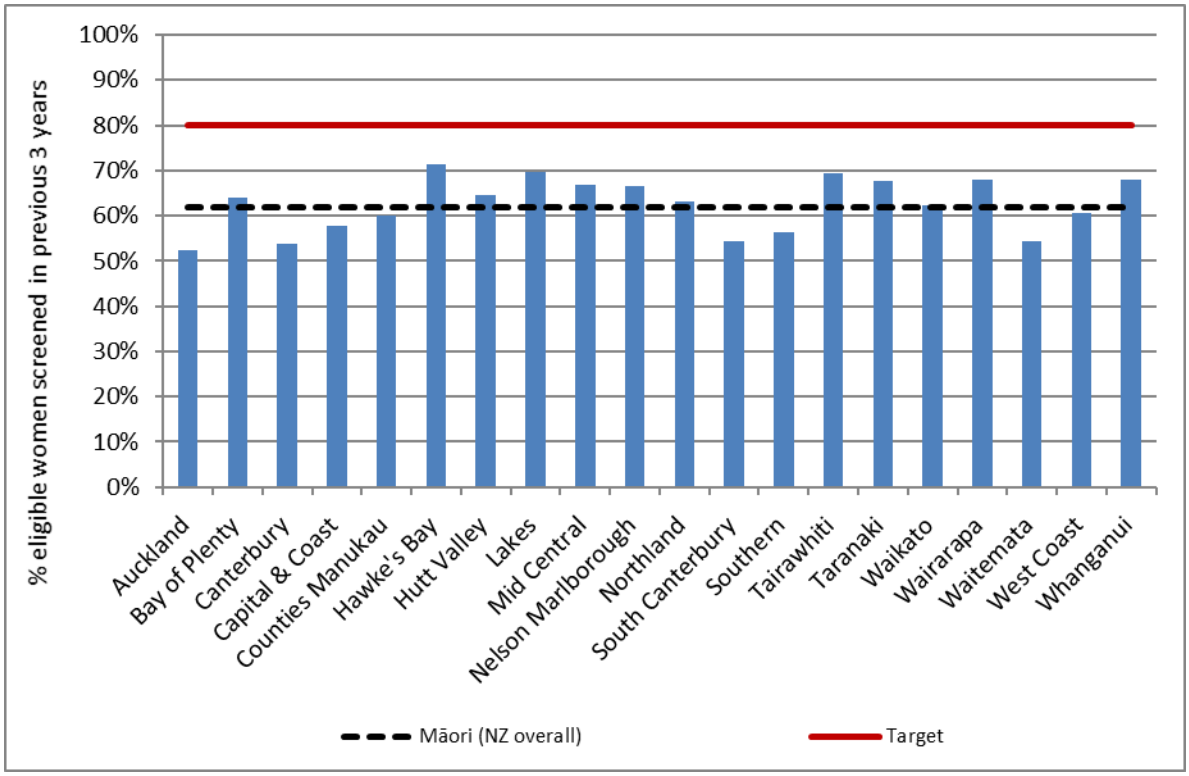
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target: 80% for ages 25-69 years, hysterectomy adjusted. See also Table 25.

Figure 3 - Three-year coverage by DHB (women 25-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population)



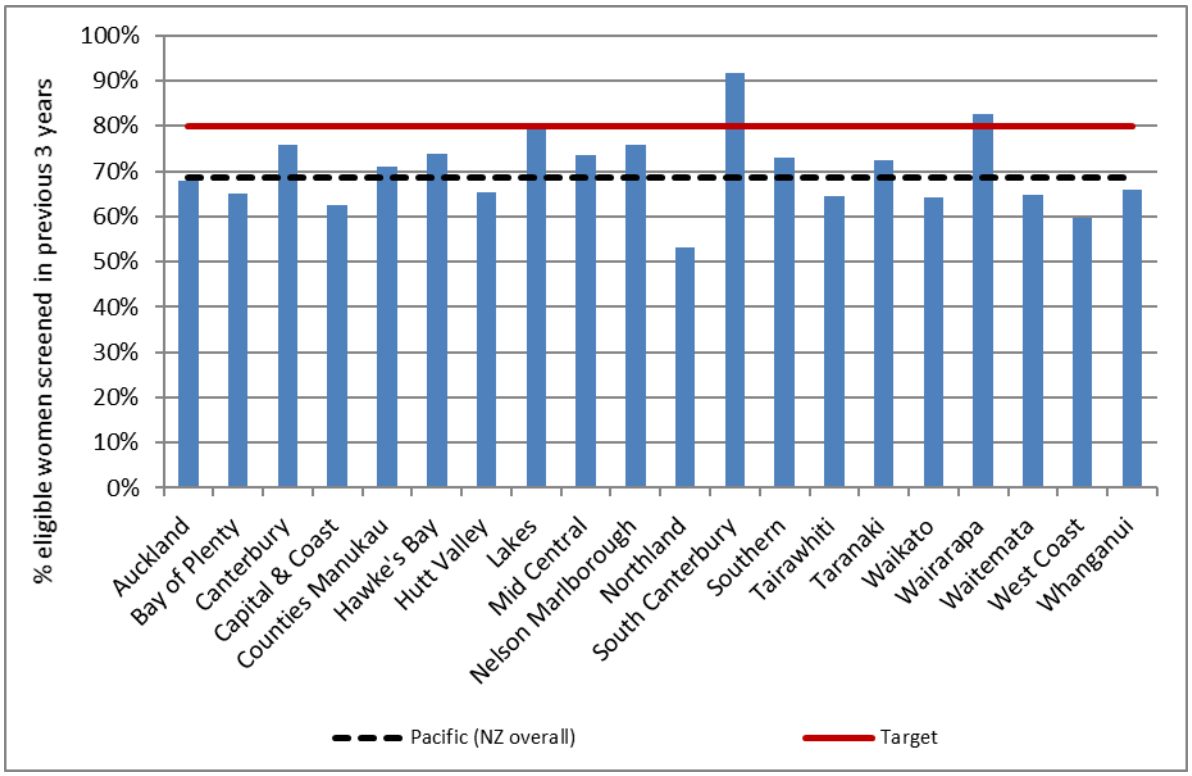
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted. See also Table 23.

Figure 4 - Three-year coverage in Māori women (women 25-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



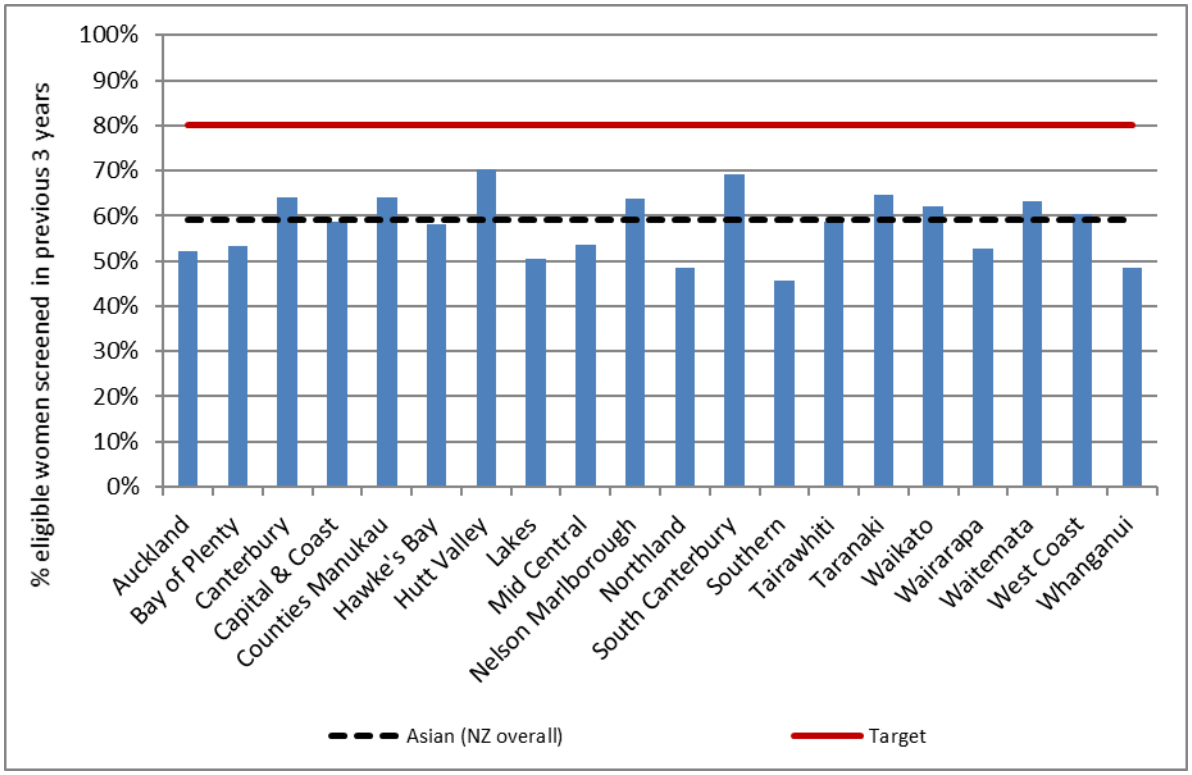
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 5 - Three-year coverage in Pacific women (women 25-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



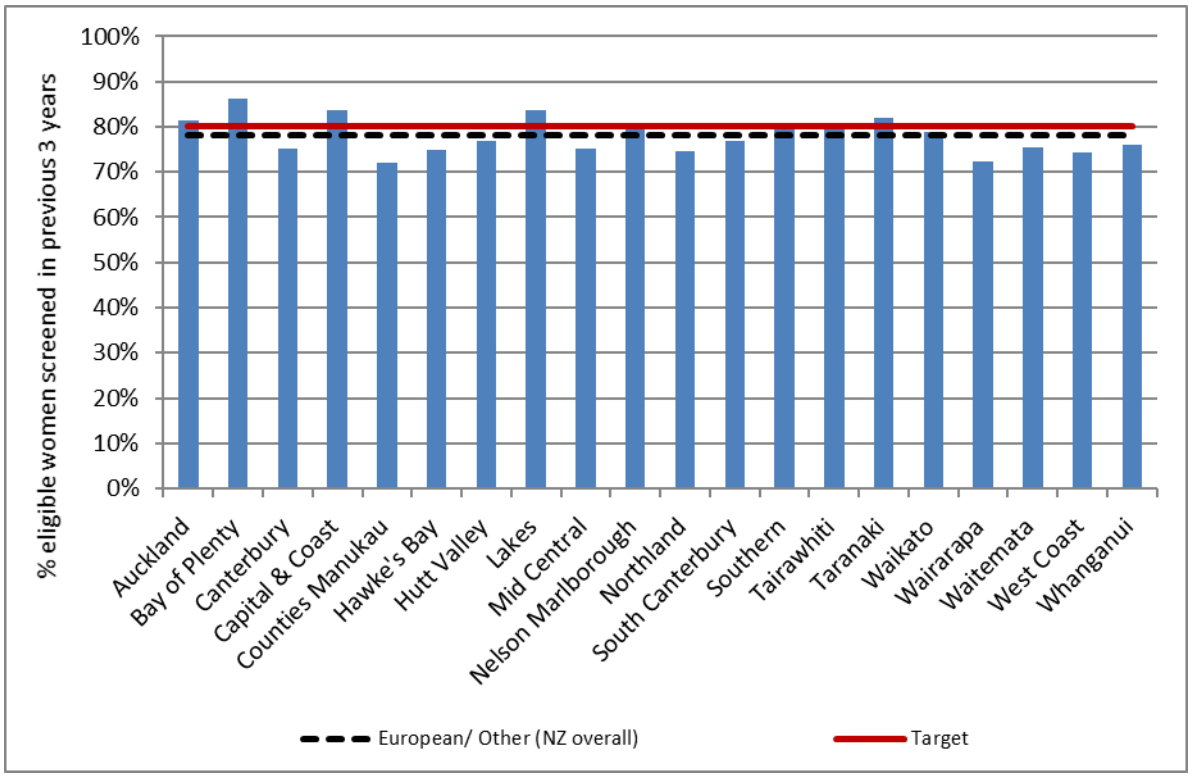
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 6 - Three-year coverage in Asian women (women 25-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



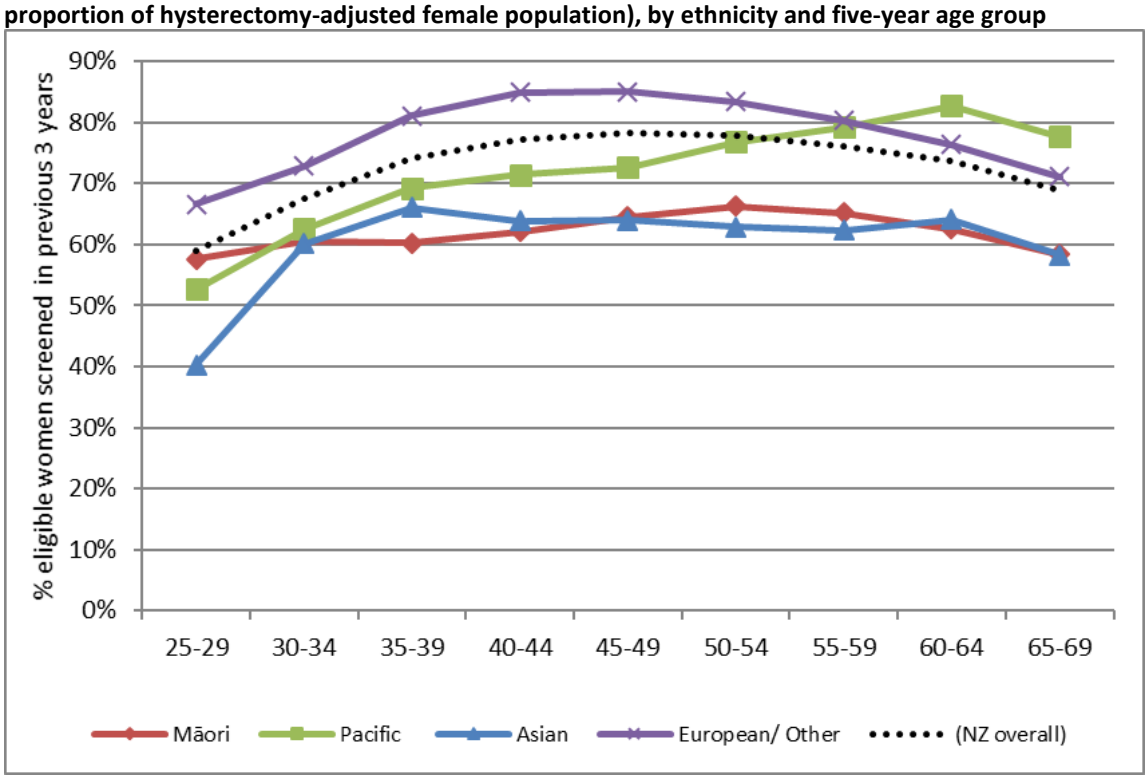
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 7 - Three-year coverage in European/ Other women (women 25-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



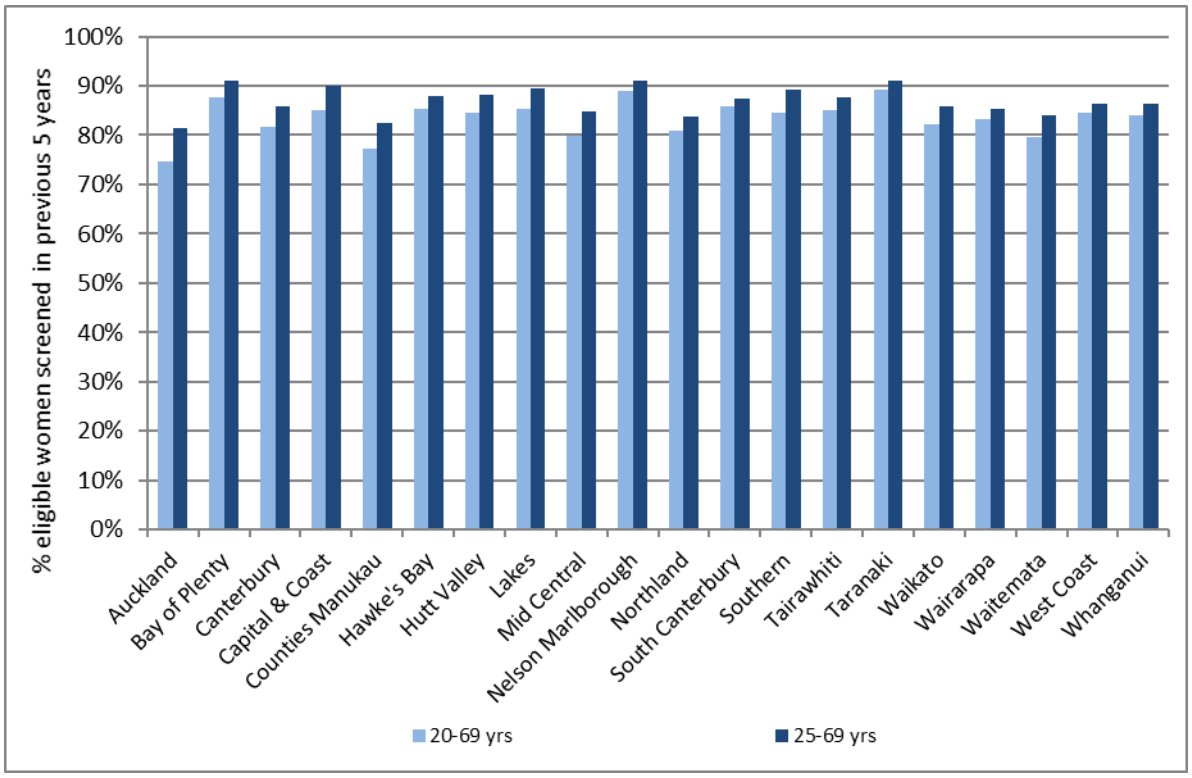
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 8 - Three-year coverage (women 25-69 years screened in the three years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by ethnicity and five-year age group



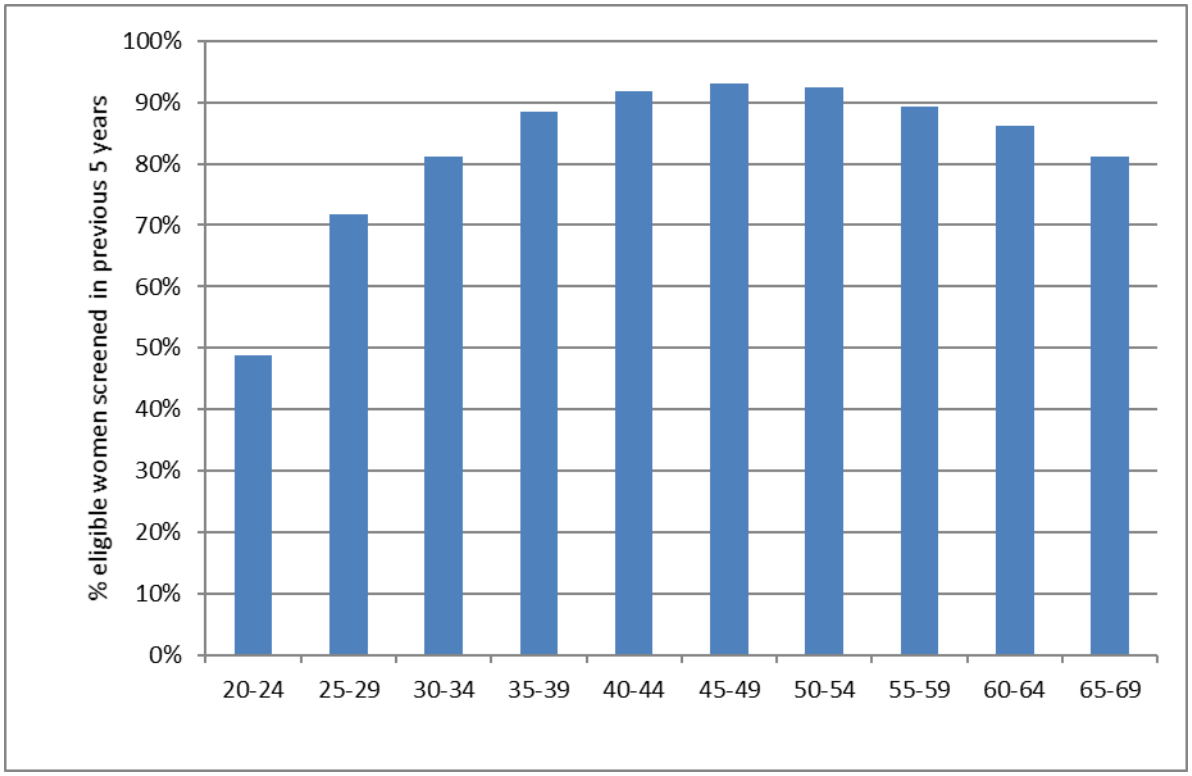
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 9 - Five-year coverage by DHB (women screened in the five years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population)



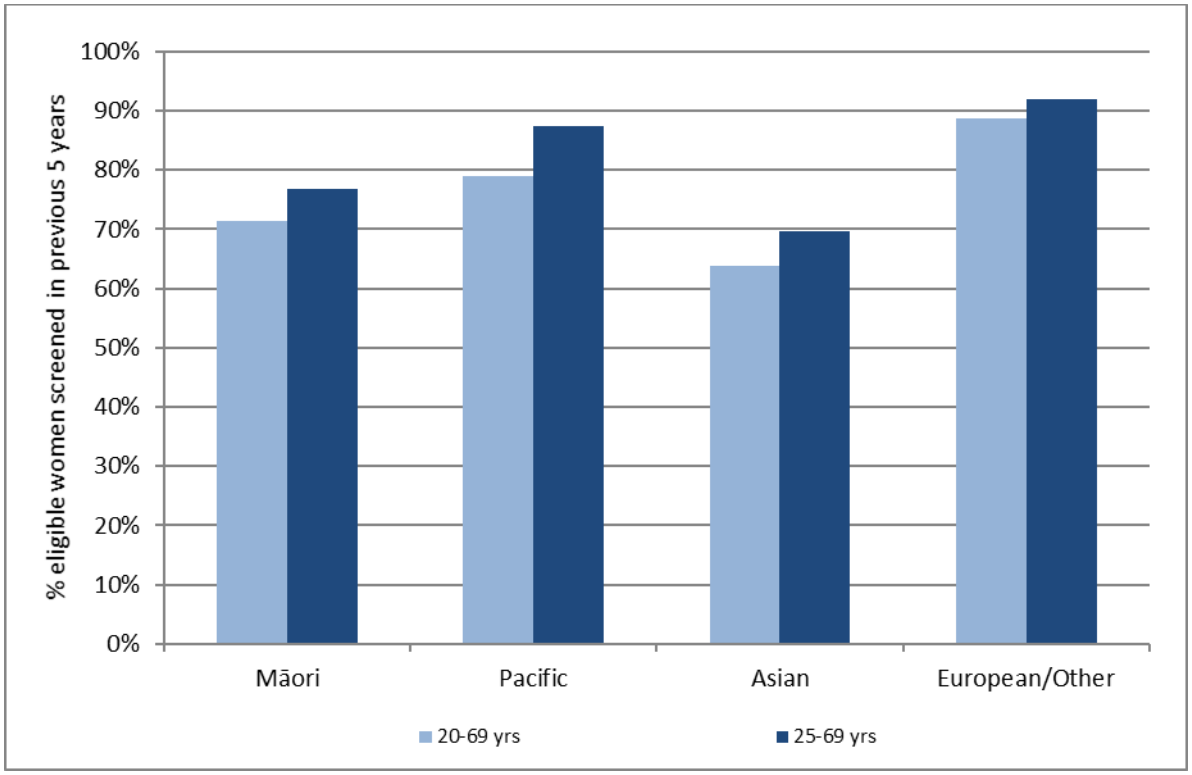
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. See also Table 28.

Figure 10 - Five-year coverage by five-year age-group (women screened in the five years prior to 30 June 2018, as proportion of hysterectomy-adjusted female population)



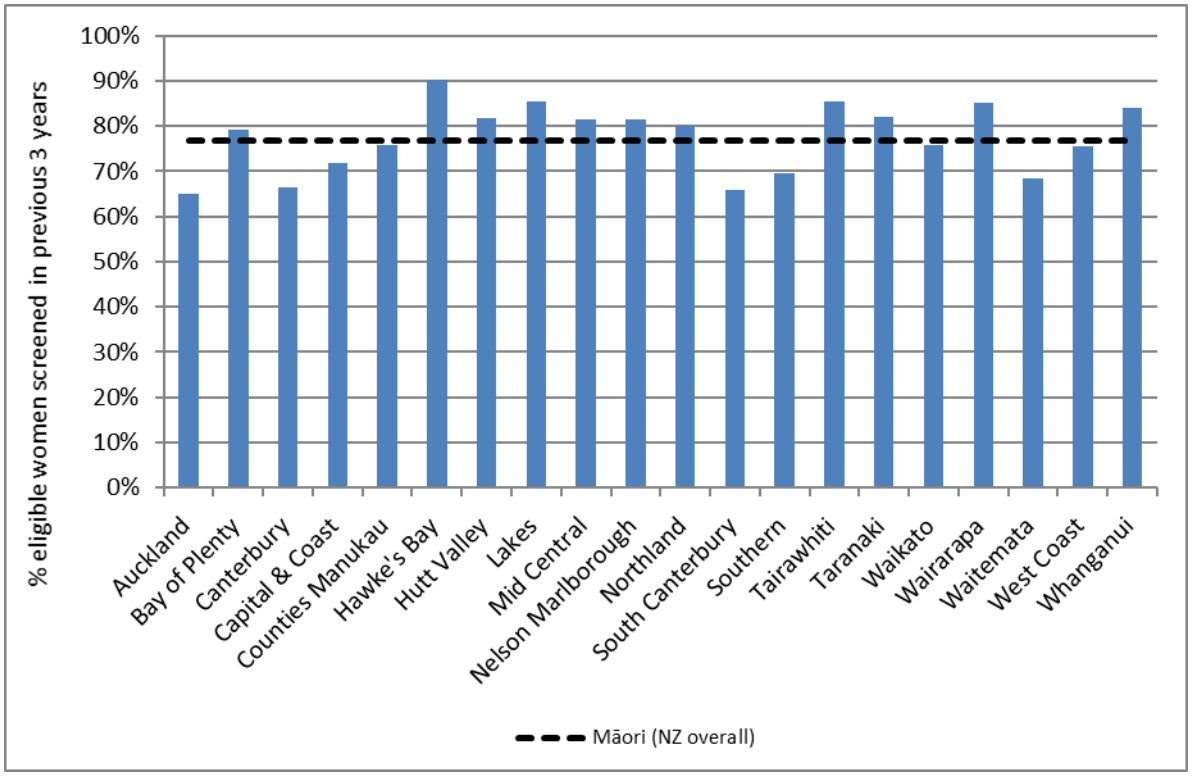
*Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data. See also **Table 30**.*

Figure 11 - Five-year coverage by ethnicity (women screened in the five years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population)



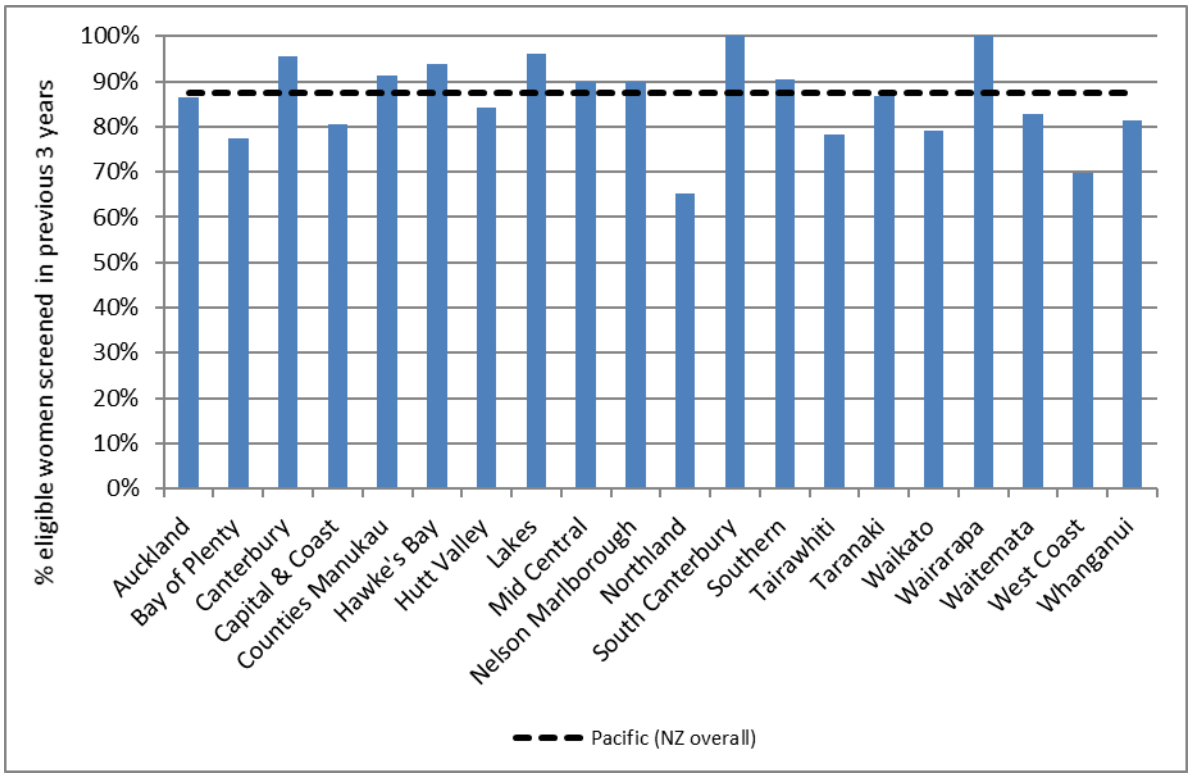
Note: Coverage calculated using population projection for based on 2013 Census data. See also Table 29.

Figure 12 - Five-year coverage in Māori women (women 25-69 years screened in the five years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



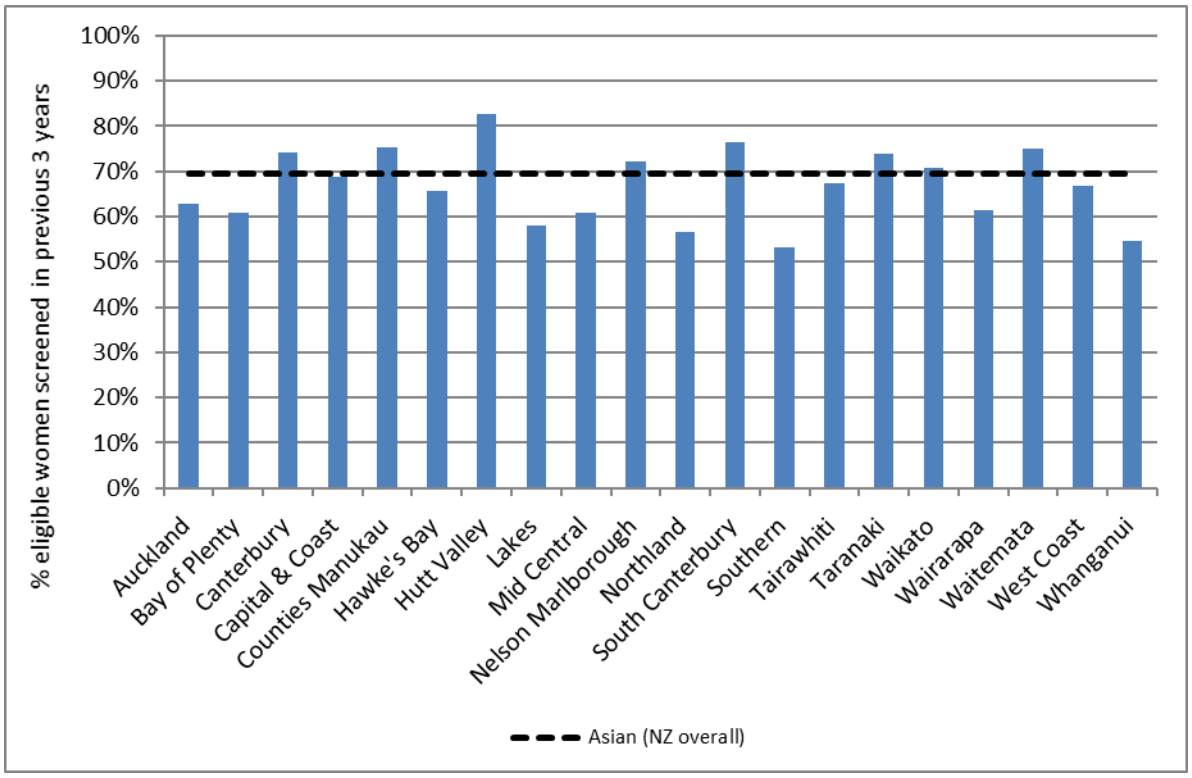
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data.

Figure 13 - Five-year coverage in Pacific women (women 25-69 years screened in the five years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



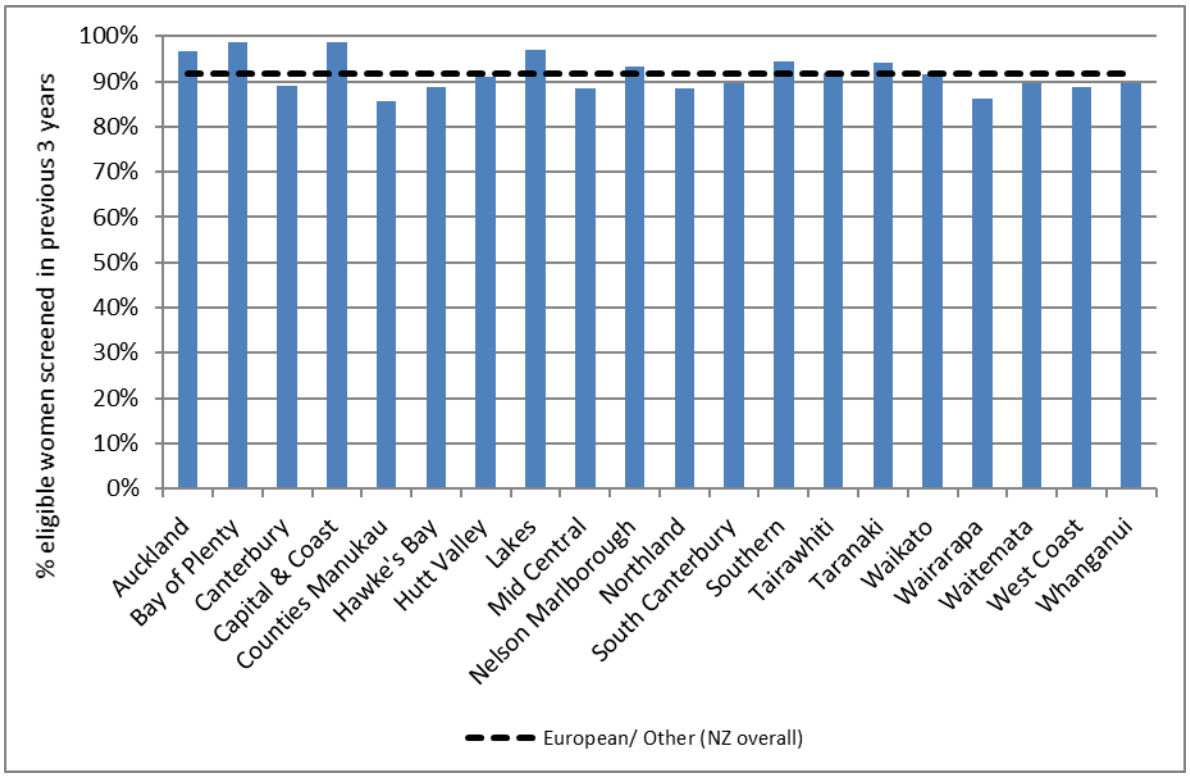
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data.

Figure 14 - Five-year coverage in Asian women (women 25-69 years screened in the five years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



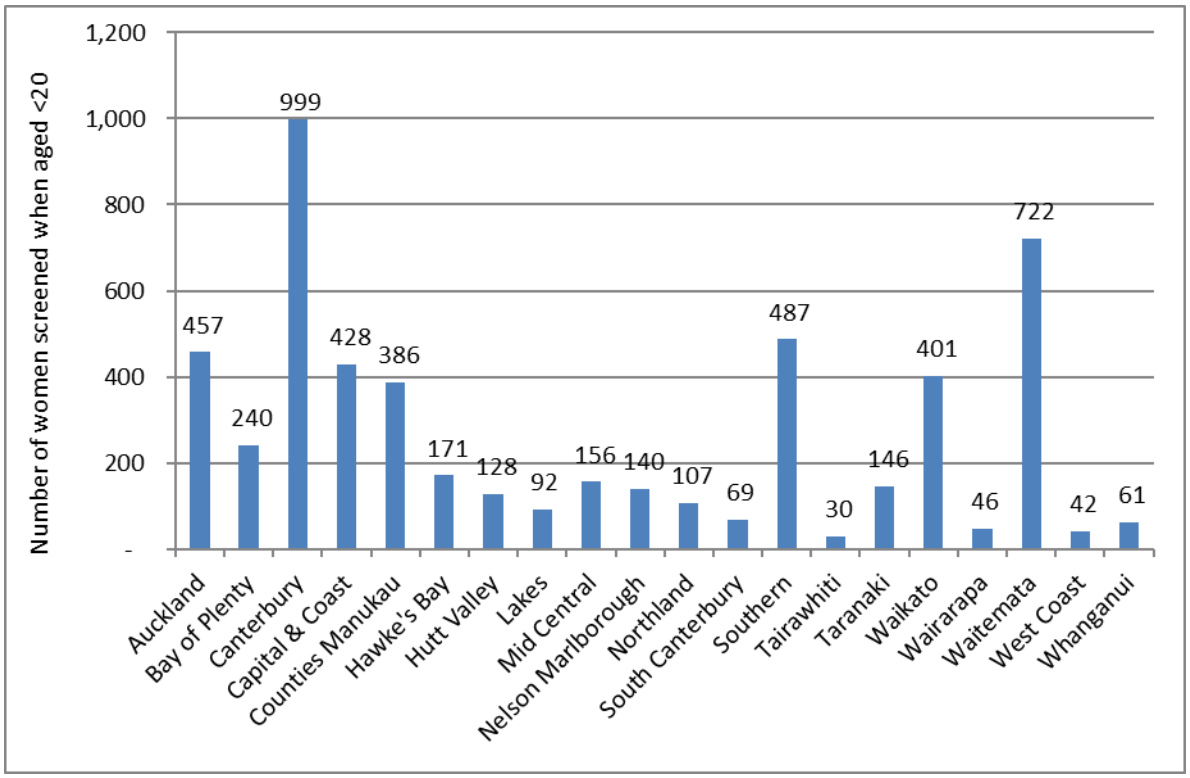
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data.

Figure 15 - Five-year coverage in European/ Other women (women 25-69 years screened in the five years prior to 30 June 2018, as a proportion of hysterectomy-adjusted female population), by DHB



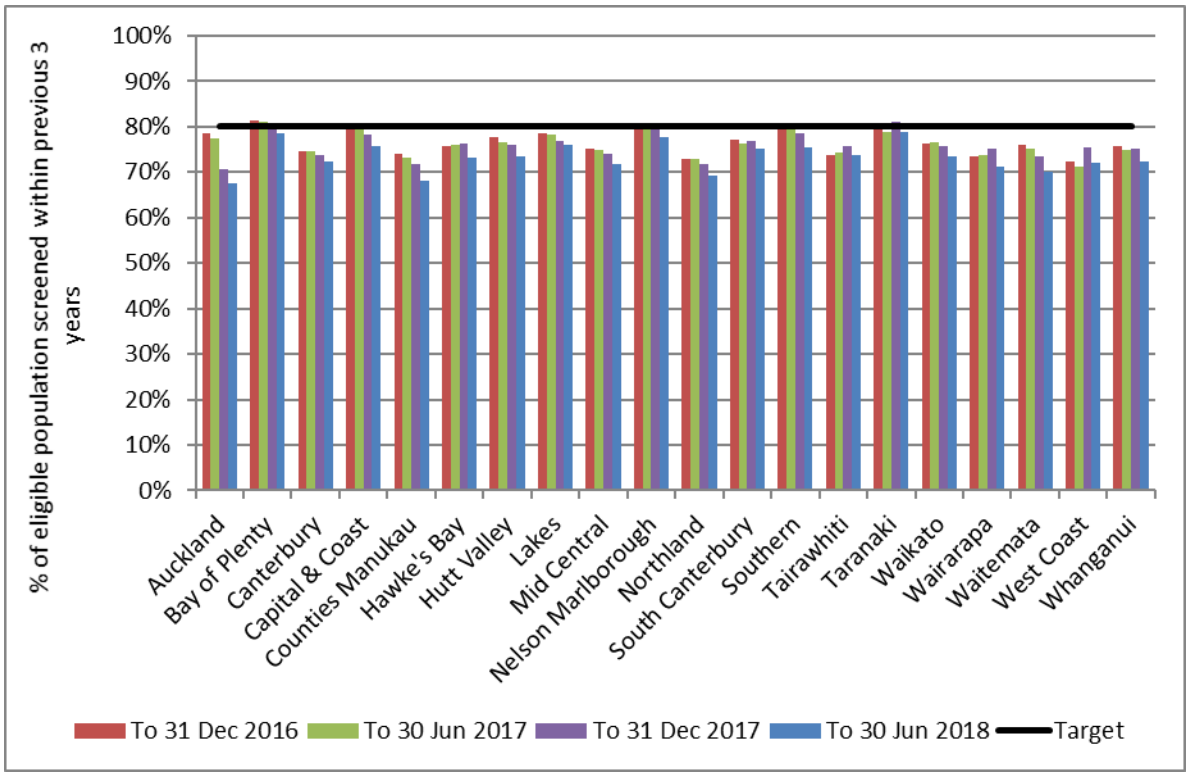
Note: Coverage calculated using population projection for 30 June 2018 based on 2013 Census data.

Figure 16 - Number of women screened who were aged less than 20 years at the time of their cervical sample in the three years to 30 June 2018, by DHB



See also Table 32.

Figure 17 - Trends in three-year coverage by DHB (women aged 25-69 years screened in the previous three years, as a proportion of hysterectomy-adjusted female population)*



**Note: Updated hysterectomy estimates and population projections were used to calculate coverage for 31 December 2017 and 30 June 2018 (2017 update 2013 Census and 2018 update 2013 Census, respectively). Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.. Target 80%. See also Table 37*

Figure 18 - Trends in three-year coverage by age (women screened in the previous three years, as a proportion of hysterectomy-adjusted female population)*

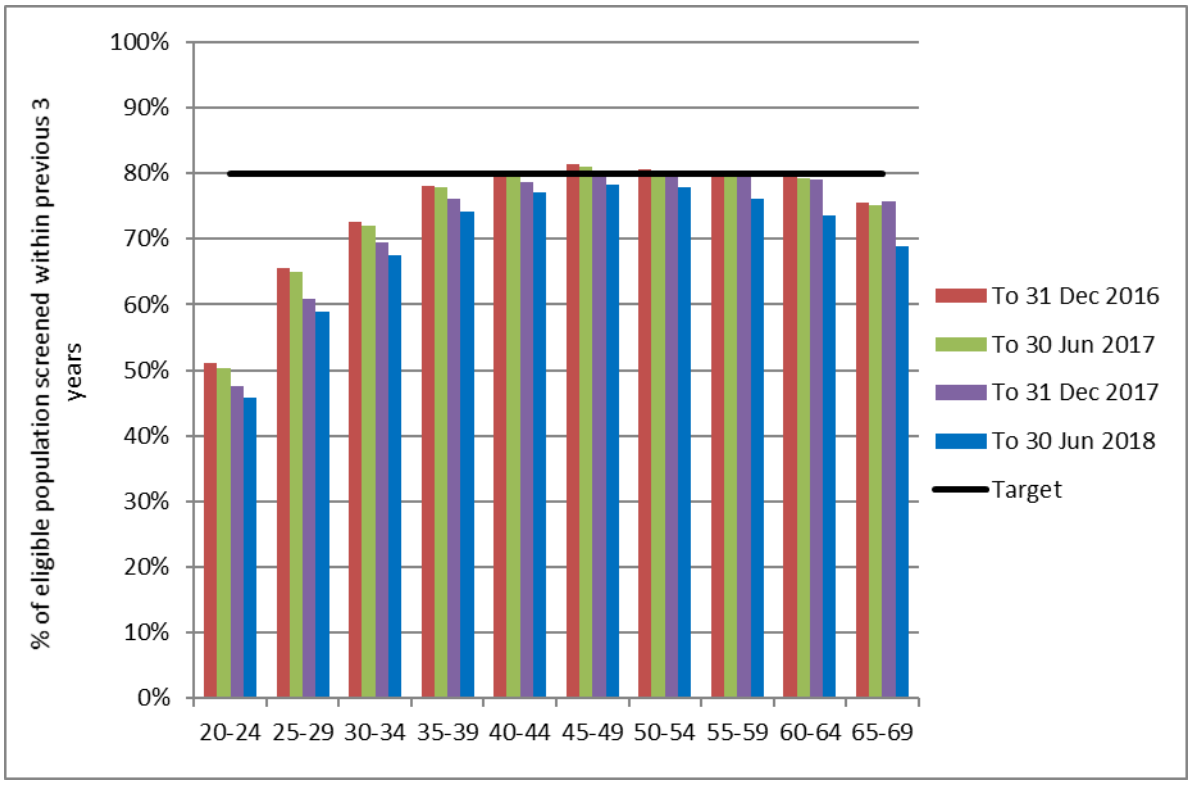
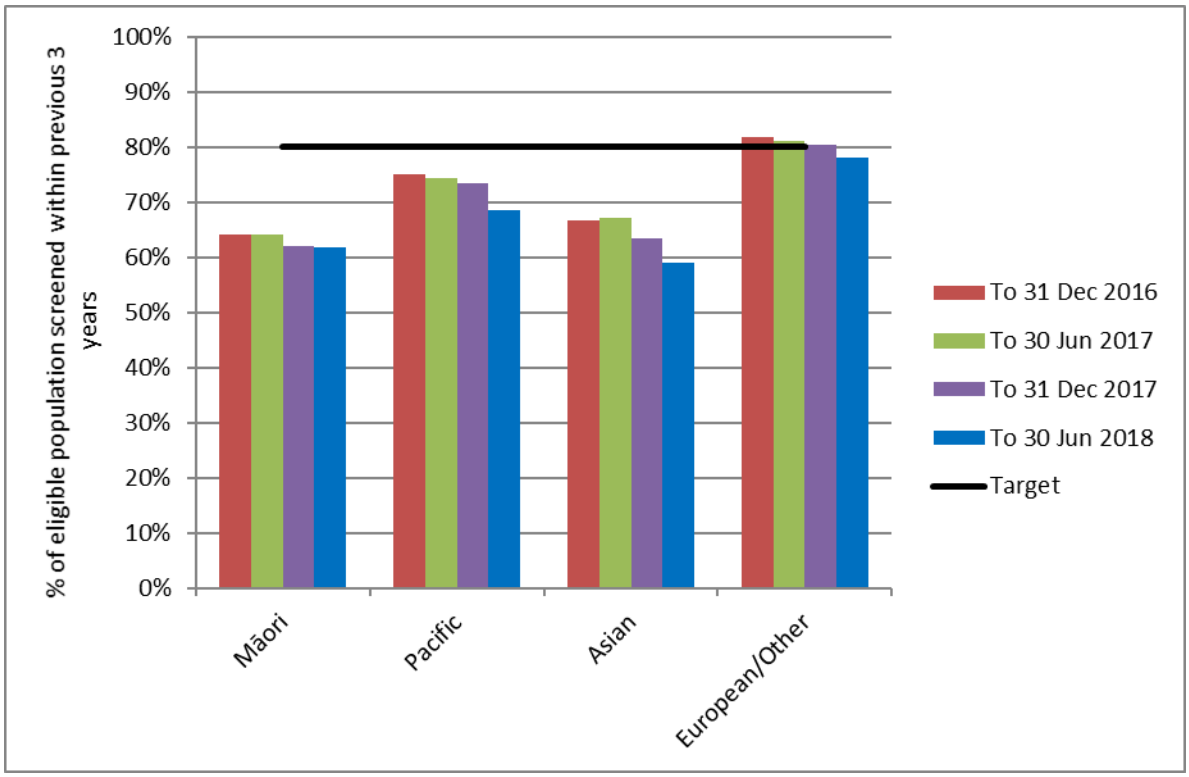
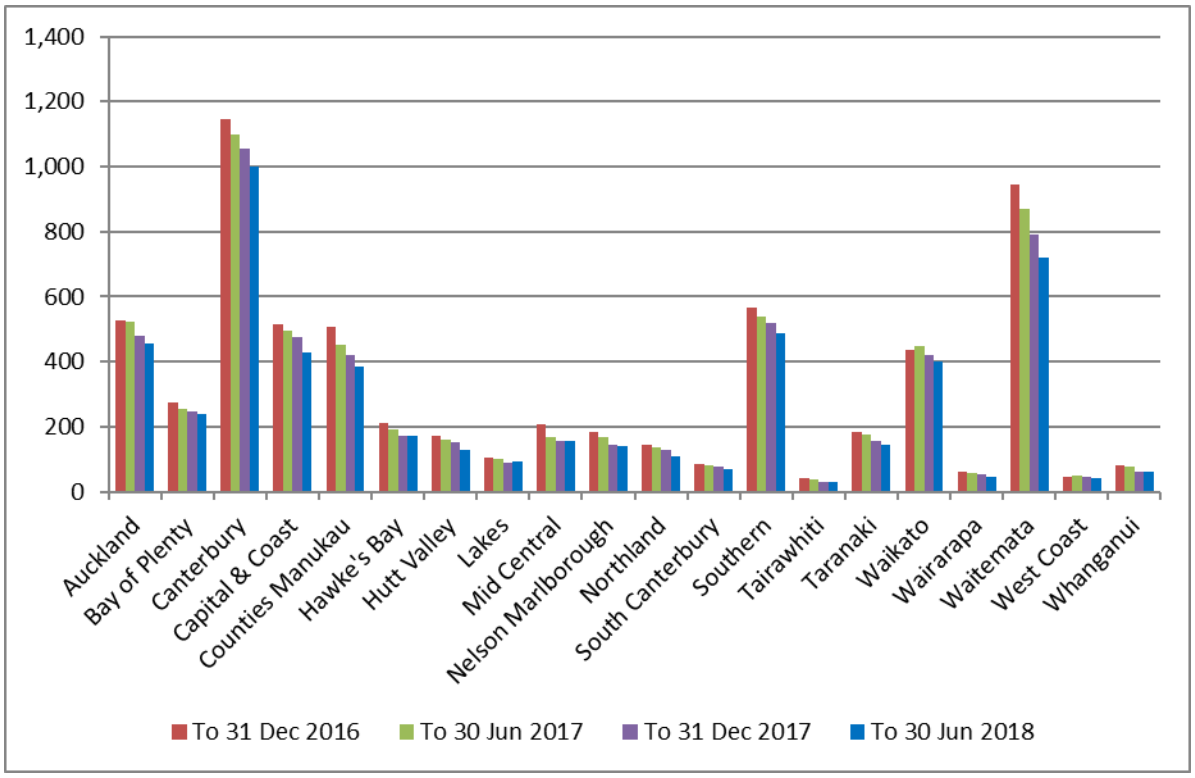


Figure 19 - Trends in three-year coverage by ethnicity (women aged 25-69 years screened in the previous three years, as a proportion of hysterectomy-adjusted female population)*



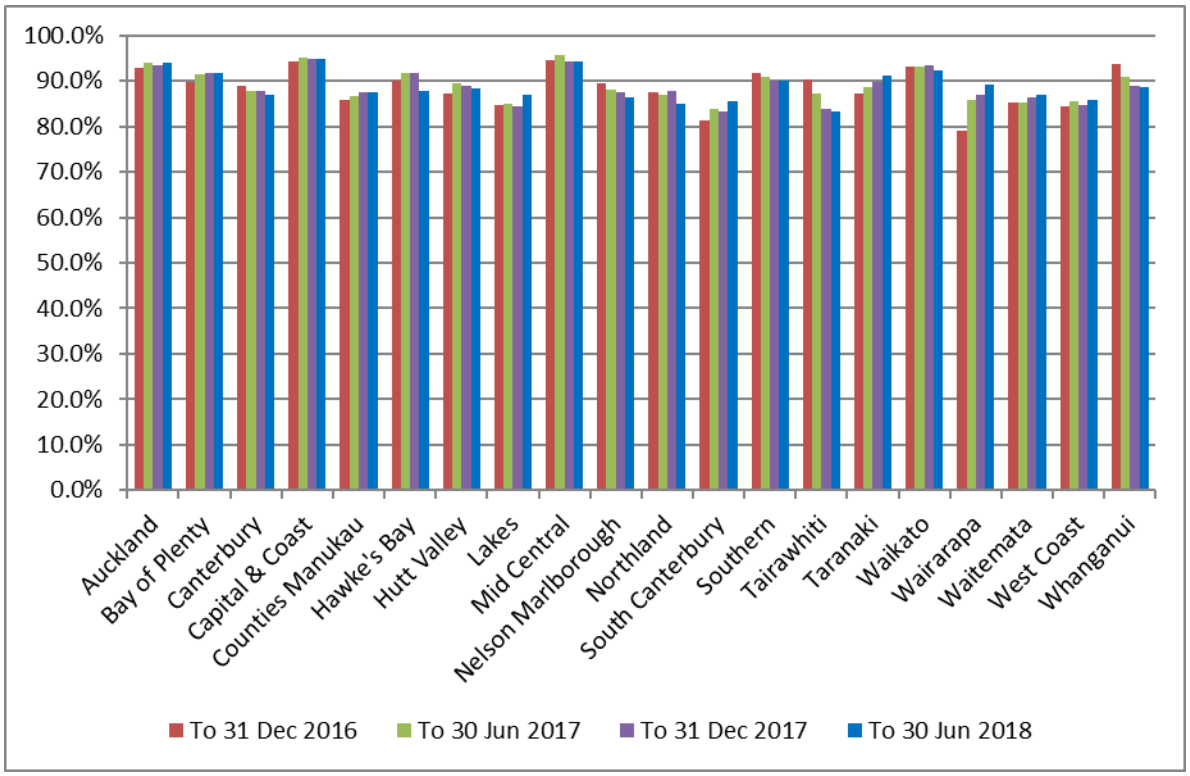
**Note: Updated hysterectomy estimates and population projections were used to calculate coverage for 31 December 2017 and 30 June 2018 (2017 update 2013 Census and 2018 update 2013 Census, respectively). Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.. Target 80%. See also Table 39*

Figure 20 - Trends in the number of women screened in the preceding three years who were aged less than 20 years at the time of their cervical sample, by DHB



See also Table 32.

Figure 21 - Trends in the percent of women aged less than 20 years at the time of their cervical sample who were aged 18 or 19 years, by DHB



Indicator 1.2 – Regularity of screening

Definition	This indicator reports on the timeliness of attendance, both for women recommended to return at the routine time of three years, or at an earlier interval of 12 months (for example following a recent abnormality). For women recommended to return at a three-year interval, on-time screening is defined as attending between 30-42 months of their previous test (that is, within +/- six months of their due date). Early and late screening are therefore respectively defined as women who attend either within 30 months (<2.5 years), or more than 42 months (>3.5 years) of their previous test. The timing of early re-screening in this context matches the definition used within Indicator 4 (the differences between early re-screening in this Indicator and in Indicator 4 are described in the *Comments* section). For women recommended to return at a 12-month interval, on-time screening is defined as attending between 9-12 months of their previous test (that is, within +/- three months of their due date). Early and late screening are therefore respectively defined as women who attend either within 9 months, or more than 15 months of their previous test.
Target	Not yet defined, however aim to maximise on-time attendance.
Current Situation	This indicator is analysed annually to allow for the full year to be examined. Timeliness of screening was last reported for women who attended during 1 January to 31 December 2017 and was provided in Report 48. This indicator will next be reported for women attending during 2018 and will be provided again in Report 50.
Trends	-
Comments	-

Indicator 2 – First screening events

Definition

Women with no cervical samples (cytology, histology, or HPV) taken prior to the current monitoring period, who have had a cervical sample taken during the monitoring period (first event).

A woman's age is defined as her age at the end of the current monitoring period (i.e. the women's age at 30 June 2018).

This indicator is presented as the number of women by age, DHB and ethnicity. It is also presented as a proportion of all women in the eligible population (defined as the hysterectomy-adjusted population, aged 20-69 years), and as a proportion of all women with a cervical sample taken during this monitoring period (screening event), by DHB.

Target

There are no targets for first screening events

Current Situation

There were 23,911 women aged 20-69 years at the end of the period who had their first screening event in the period 1 January - 30 June 2018. This constituted 11.0% of the 217,135 women aged 20-69 years with a cervical sample taken in the period (screening event), and 1.6% of the eligible population. The median age (at the end of the monitoring period) of women with a first event recorded was 26 years.

The age group with the highest number of first screening events was women aged 20-24. 10,546 women aged 20-24 had their first screening event recorded on the register during this monitoring period, accounting for 45.2% of all women aged 20-69 years with first screening events (Figure 22, Table 40). First screening events then tended to decrease with increasing age. Women aged 20-24 years also had the highest proportion of women screened in their age group who were being screened for the first time (44.1%; Figure 23), and the highest proportion of the eligible population at that age with a first screening event recorded in the current monitoring period (6.1%) (Figure 24).

The DHBs with the highest number of women aged 20-69 years with first screening events were Auckland (3,639) and Waitemata (3,237). The DHBs where women with first screening events, as a proportion of all women with screening events, were the highest in Auckland (14.7%) followed by Counties Manukau (13.0%) and Capital & Coast (12.8%). The DHBs where this proportion was lowest was Wairarapa (6.4%), and South Canterbury (6.7%) (Figure 24, Table 41).

The ethnic group with the highest number of women with first screening events was European/ Other (13,093 women; Figure 25, Table 42). The group with the highest proportion of their eligible population being screened for the first time was Asian women (2.8%), and the lowest was Māori women (1.3%) (Table 42). The proportion of women screened who were being screened for the first time was highest for Asian women (22.6%; Figure 25, Table 42). This proportion is likely to be related to the median age of women with a first screening event, which is comparatively high for

Asian women (31 years, compared with 22 years for Māori women, 25 years for Pacific women, and 24 years for European/ Other women; Table 43).

Trends

The number of women with a first screening event recorded on the NCSP Register has increased from 22,618 women in the previous period to 23,911 in the current period. Across the overall eligible population aged 20-69 years, the proportion of women with screening events that are their first screening event being recorded on the NCSP Register is similar in this period (1.6%) and the previous period.

Patterns by age, DHB, and ethnicity are broadly similar to those seen in the previous report. Trends by age show a steady number of first screens in most five-year age groups when compared to the previous report. A noticeable increase in the number of first screens is seen in women aged 20-39 years. Small increases in the number of women with first screening events is seen in two ethnicities, Asian and European/ Other women (An increase from 22.4% to 22.6% for Asian women and 8.5% to 8.7% in European/ Other women). As was the case in previous reports, the median age of a first screening event was older for Asian women than for Māori, Pacific and European/ Other women, and in Asian women, those with a first screening event constituted a larger proportion of all women screened than in other ethnic groups.

Trends over the two years ending 30 June 2018 are shown in Figure 26 (by age), Figure 27 (by DHB), and Figure 28 (by ethnicity).

Comments

This indicator can only measure the number of women with their first screening event in New Zealand, recorded on the register since its introduction (1990). It does not capture screening events which occurred outside New Zealand, or among women who are not enrolled on the NCSP Register.

Some differences in counts and proportion of women with first screens among screened women between DHBs are to be expected due to differences in population size, immigration and age structure. Proportions have been provided to partially account for this, however they should be interpreted with caution. For example, a relatively low number of women with first screens as a proportion of all women screened could be due to either a lower number of women with first events, or a higher number of women with screening events. If coverage remains high, then this proportion will inevitably decrease, as fewer women are available to be screened for the first time. Conversely, a relatively high number of women with first screens as a proportion of all women screened could be due to either a higher number of women with first events (due to increasing coverage), or a lower number of women with screening events (for example due to less frequent screening among women who have been screened at least once since the inception of the NCSP Register).

Figure 22 - Women with first screening events during the monitoring period, by five-year age group (women aged 20-69 years at 30 June 2018)

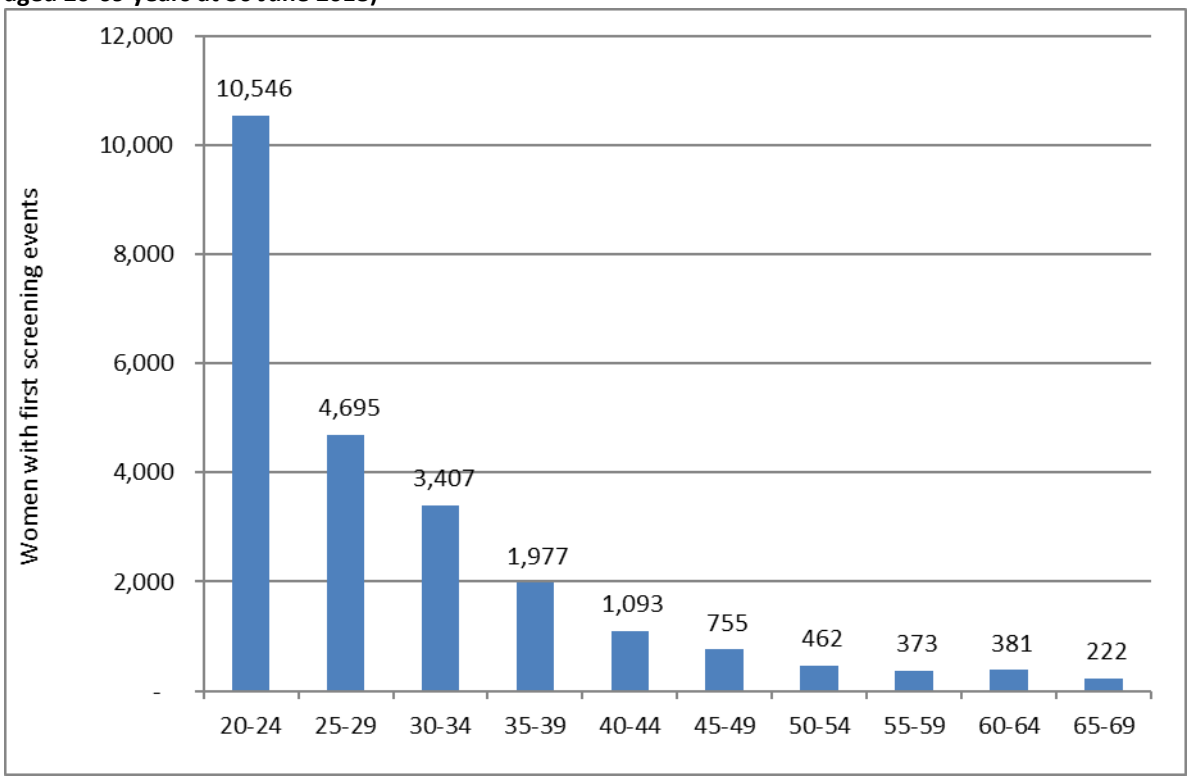


Figure 23 - Women with first screening events as a proportion of all women screened in that age group during the monitoring period, by five-year age group (women aged 20-69 years at 30 June 2018)

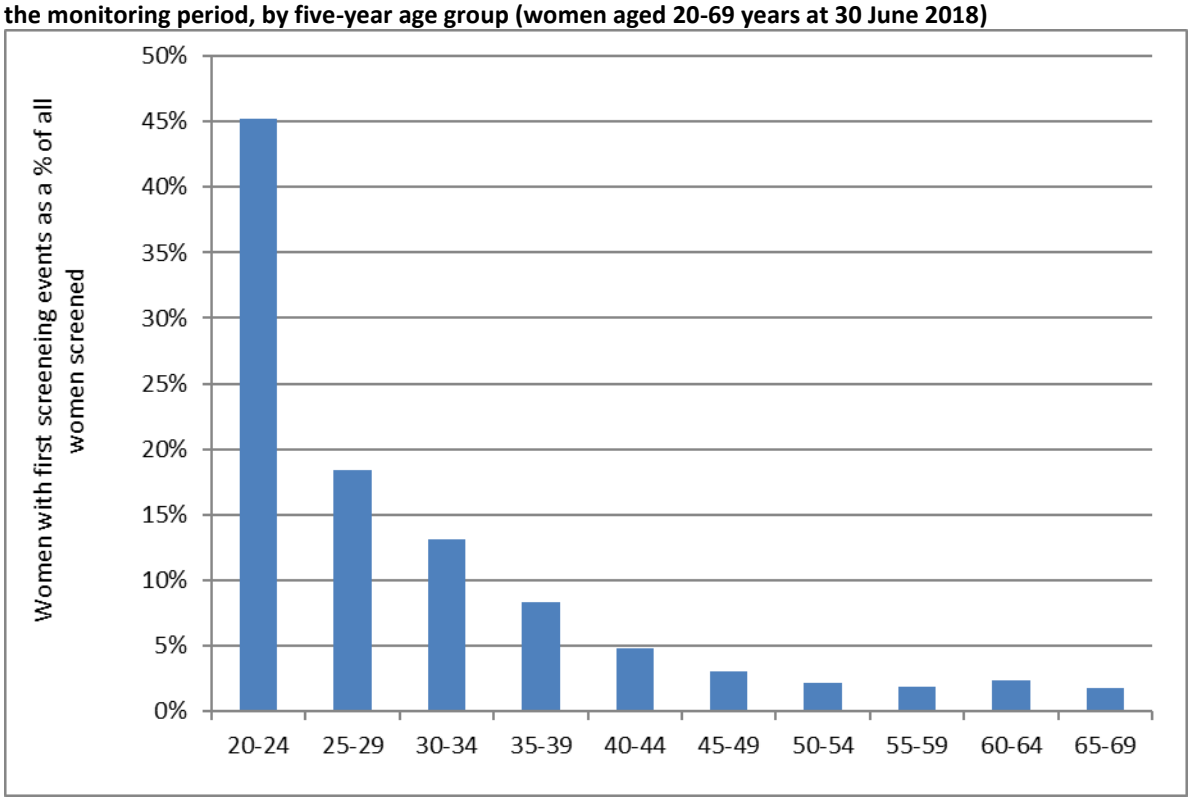


Figure 24 - Women with first screening events as a proportion of all women screened during the monitoring period, by DHB (women aged 20-69 years at 30 June 2018)

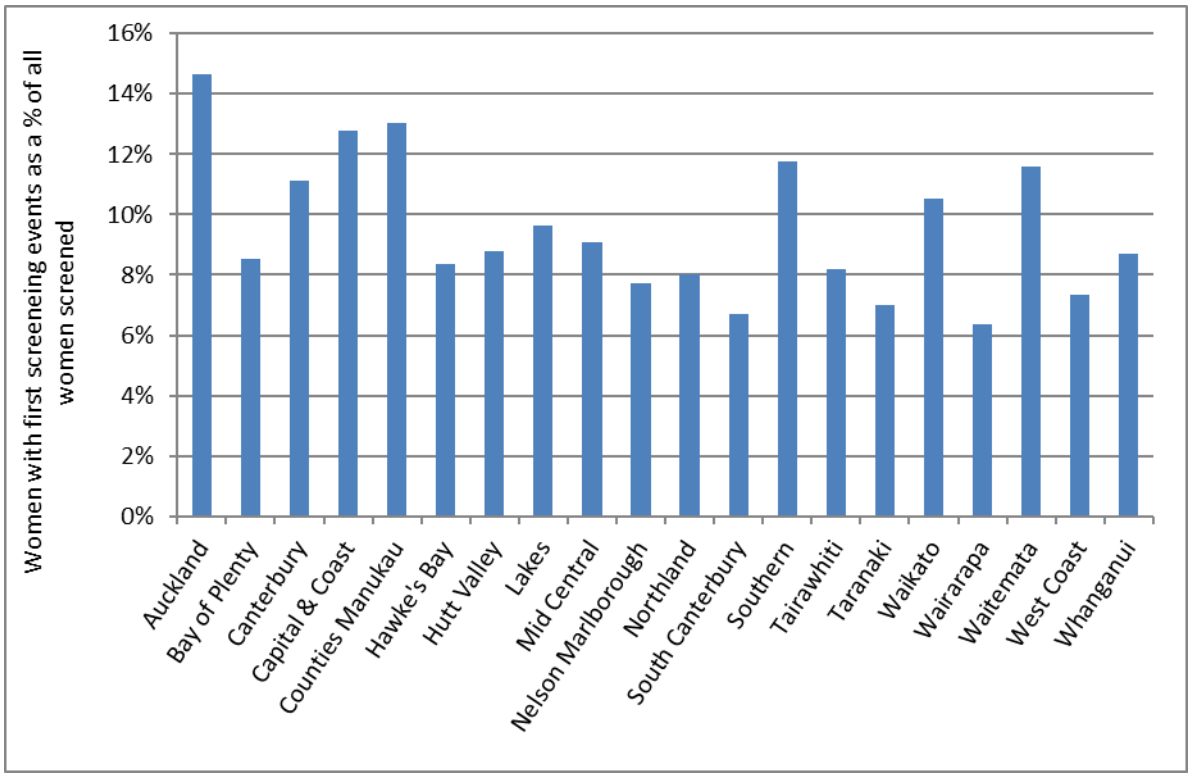


Figure 25 - Women with first screening events as a proportion of all women screened during the monitoring period, by ethnicity (women aged 20-69 years at 30 June 2018)

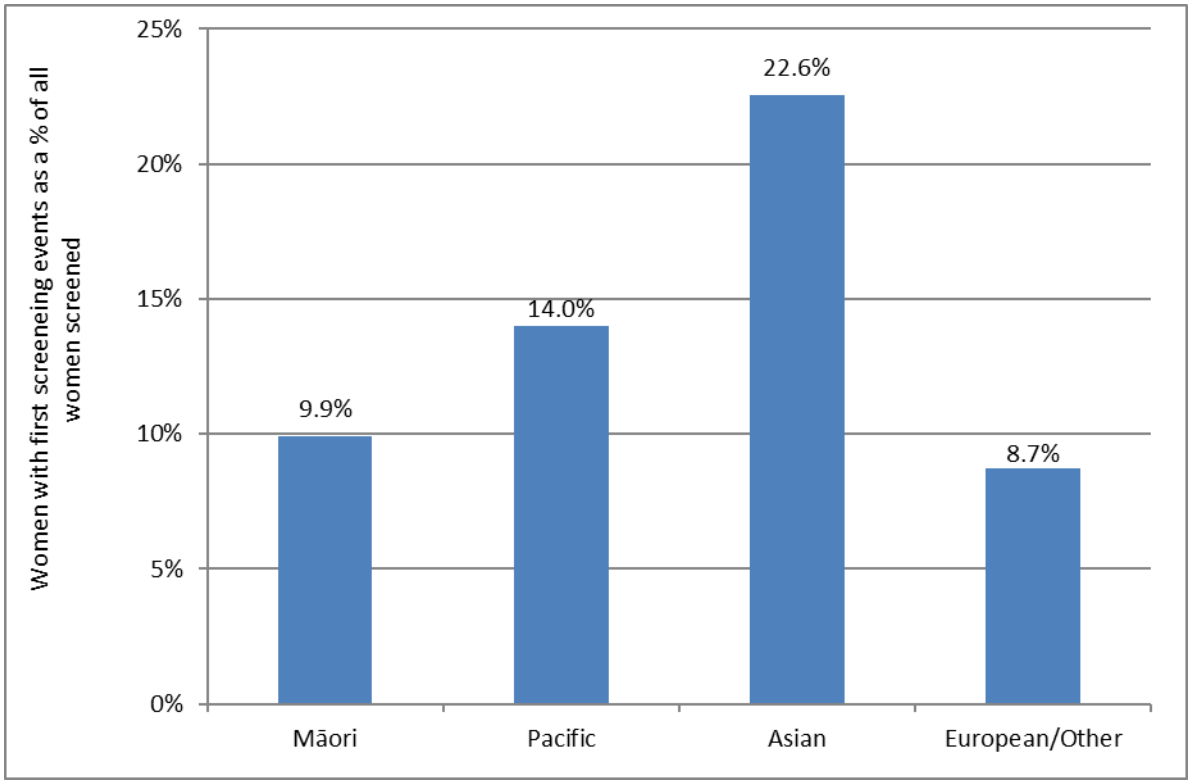


Figure 26 - Trends in the number of women with a first screening event, by age

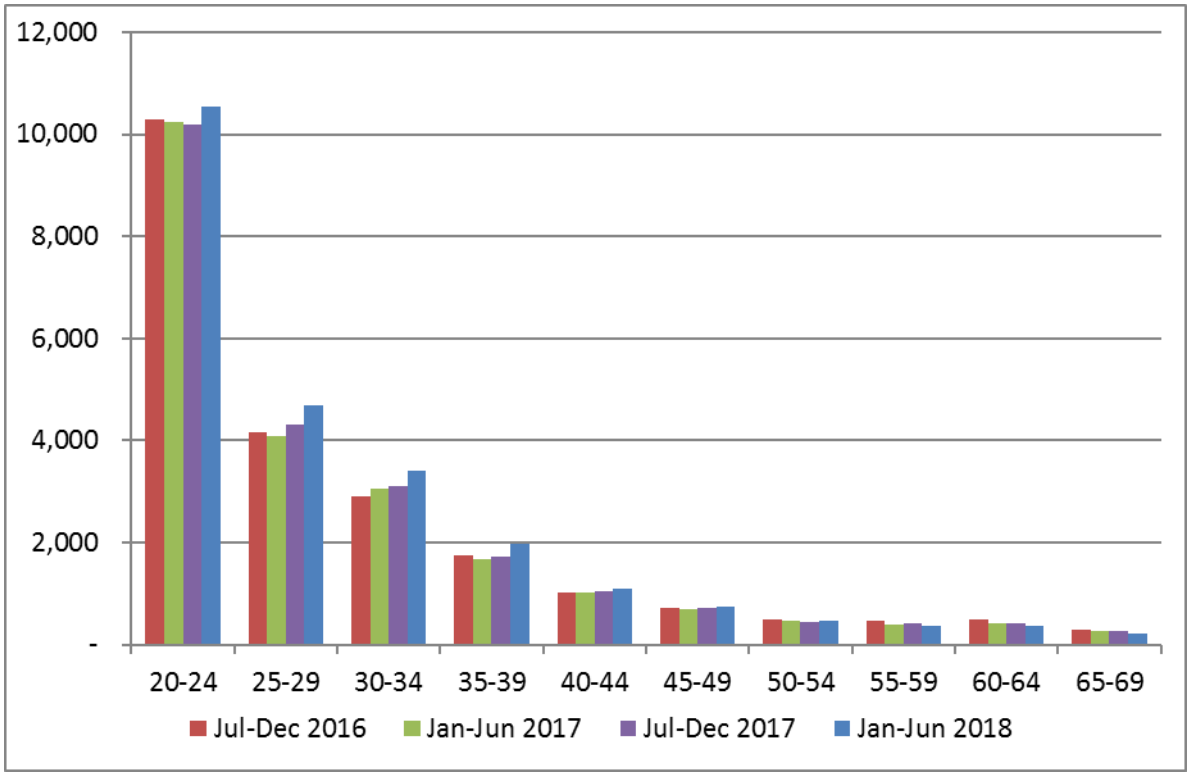


Figure 27 - Trends in the number of women with a first screening event, by DHB

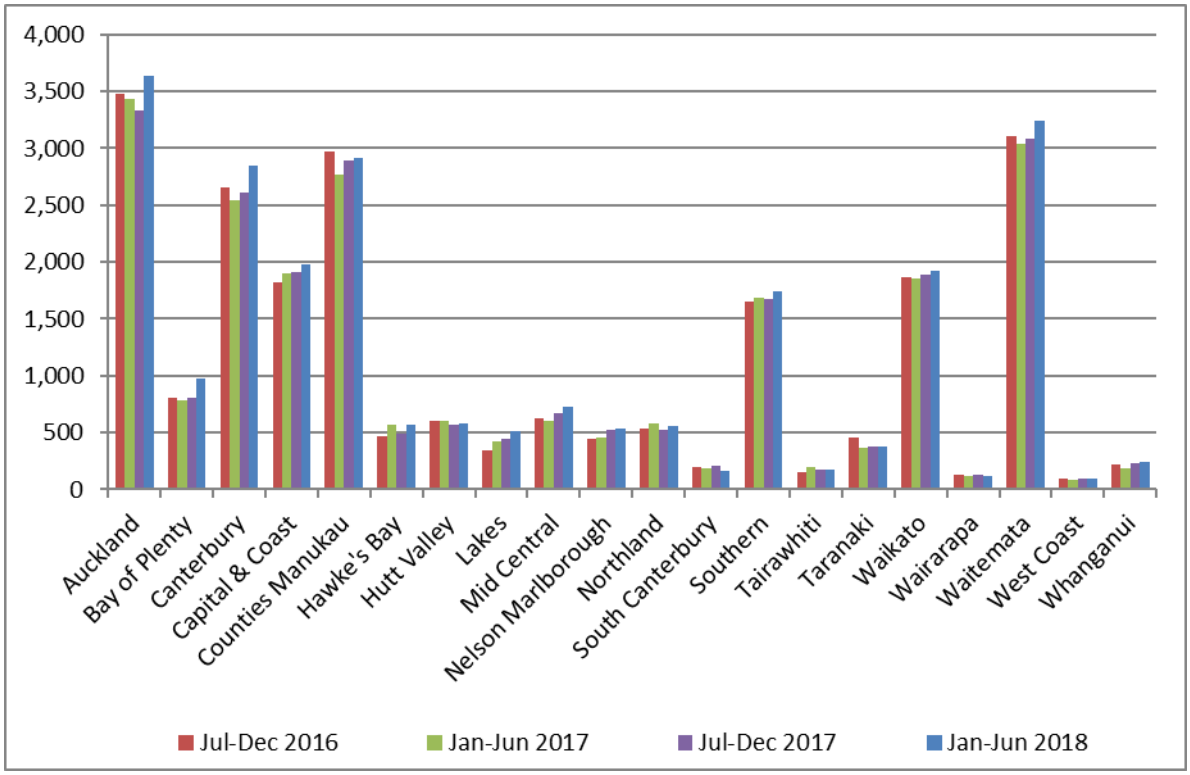
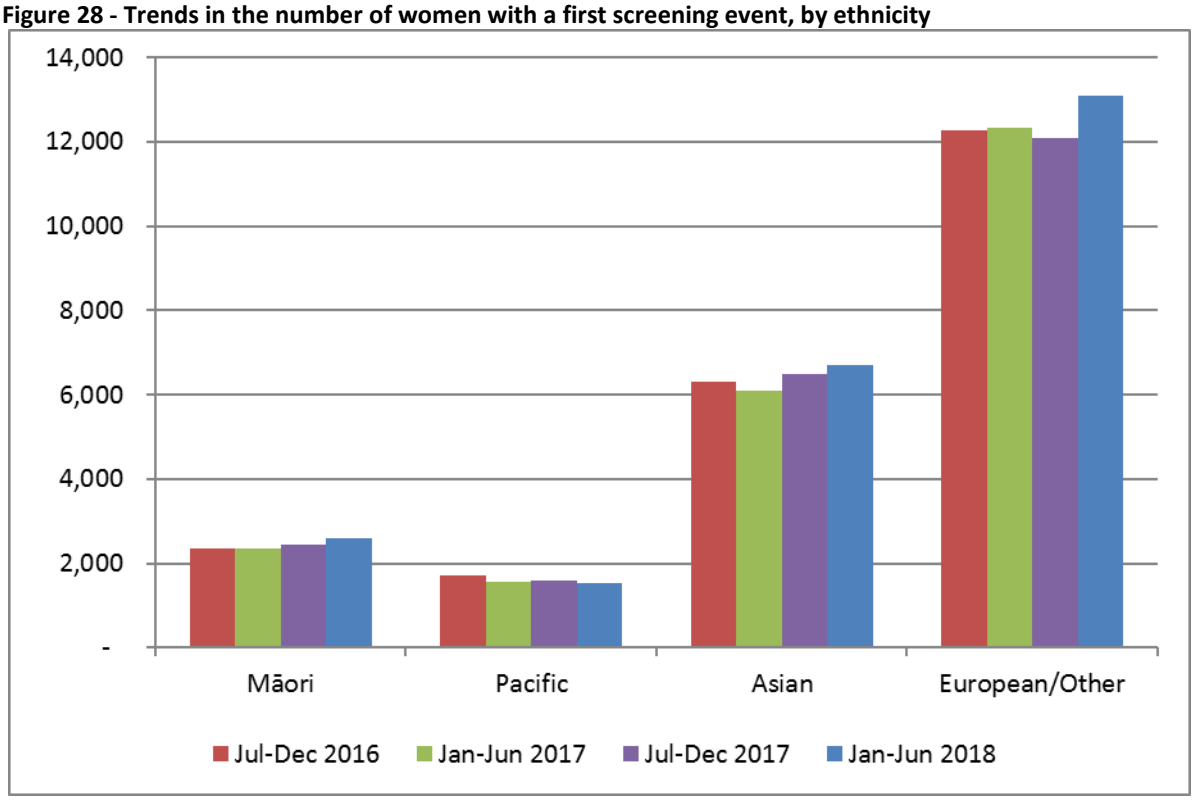


Figure 28 - Trends in the number of women with a first screening event, by ethnicity

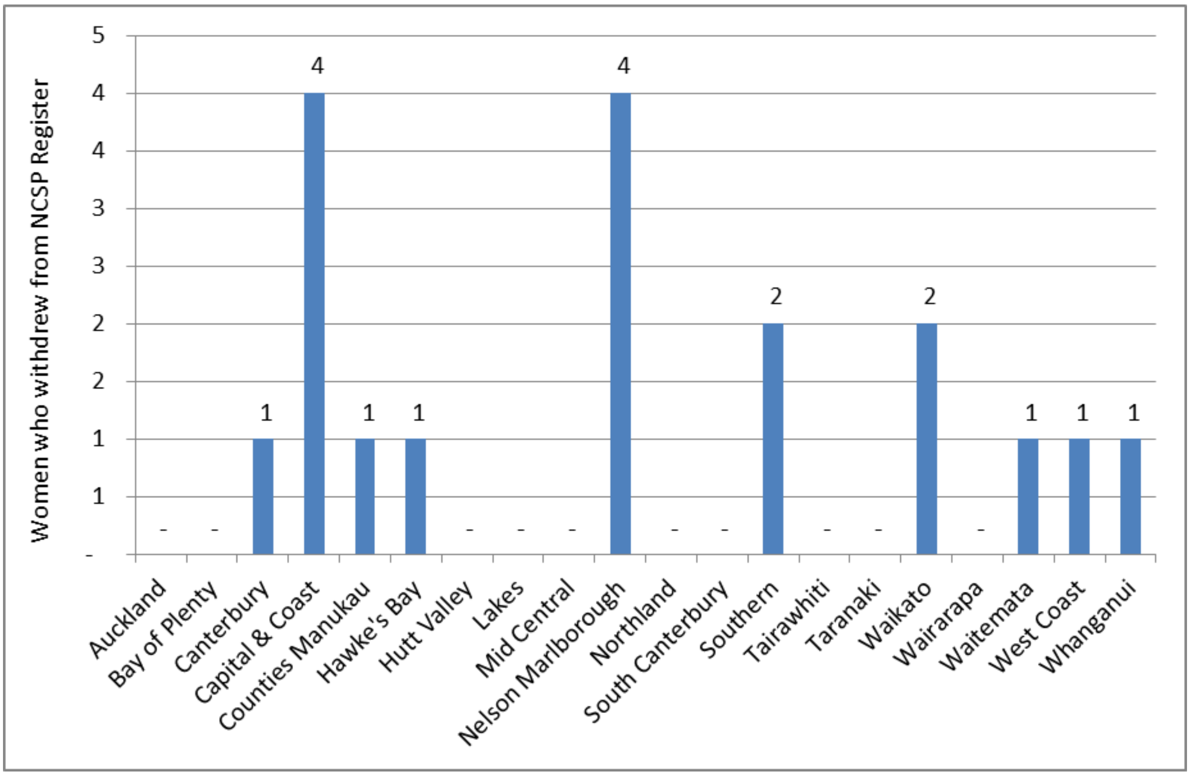


Indicator 3 – Withdrawal rates

Definition	The number of women, by age-group, DHB, and ethnicity not currently enrolled in the NCSP Register and whose enrolment ended during the monitoring period (withdrawals). Withdrawals relate to active withdrawals, where women specifically elect to be removed from the NCSP Register. Withdrawals are also reported as a proportion of women who were enrolled on the NCSP Register at 30 June 2017 (i.e. just prior to the commencement of the current monitoring period). This is also reported by age group, DHB, and ethnicity. Age is defined as a woman's age at the end of the monitoring period (i.e. at 30 June 2018).
Target	Zero for ages 20-69 years.
Current Situation	At the end of the previous monitoring period, 1,603,282 women aged 20-69 years were enrolled on the NCSP Register. During the current monitoring period, 22 of these women (0.001%) withdrew from the NCSP Register. In all DHBs, the number and proportion of women who withdrew was extremely small (maximum four women in the Capital & Coast and Nelson Marlborough regions). No women withdrew in ten of the twenty DHB regions (Figure 29). The number and proportion of women withdrawing was extremely small for all age groups, but were largest among women aged 60-64 years (4 women, 0.003% of those enrolled at the end of the previous monitoring period), 55-59 years (4 withdrawals, 0.002%) and 45-49 years (3 withdrawals, 0.001%) (Figure 30, Table 44). The number and proportion of women withdrawing was extremely small for all ethnic groups. One Māori and One Pacific women withdrew in the current monitoring period (<0.001% and 0.001%, respectively), while 18 European/ Other women (0.002%) and two Asian women (0.001%) withdrew during the current monitoring period (Figure 31, Table 45).
Trends	The number of women who withdrew in the current monitoring period (22 women) is higher than in the previous monitoring period (20 women). The overall number of withdrawals and the withdrawals as a proportion of all women enrolled both continue to be extremely small.
Comments	The proportion of women choosing to withdraw from the NCSP Register is extremely small.

	Withdrawals relate to active withdrawals, where women specifically elect to be removed from the NCSP Register. It does not include, for example, women who have moved overseas, or who have died during the period, and who therefore are not having tests recorded on the NCSP Register or who ask for no more communications but still participate in the Programme and have their results recorded on the NCSP Register.

Figure 29 - Number of women (aged 20-69 years) who withdrew from the NCSP Register by DHB, 1 January – 30 June 2018



Excludes 4 women who withdrew whose DHB was not recorded.

Figure 30 - Number of women who withdrew from the NCSP Register by age, 1 January – 30 June 2018

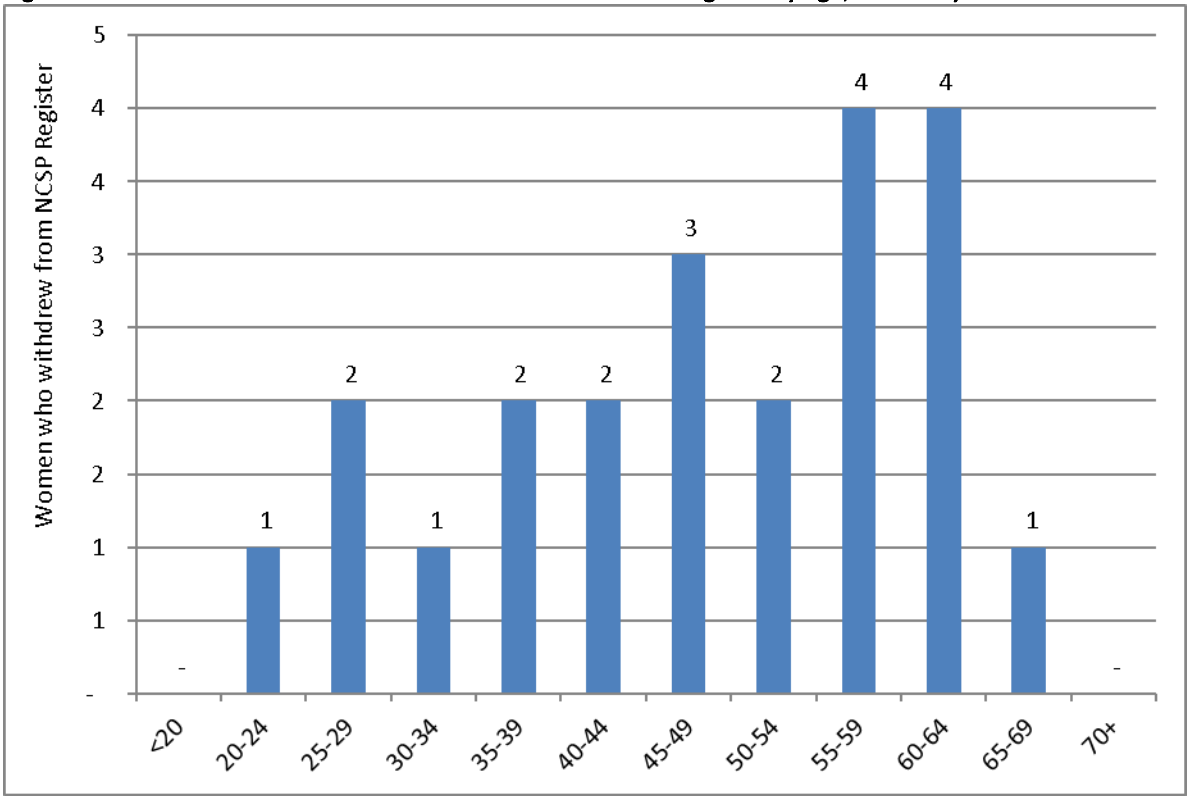
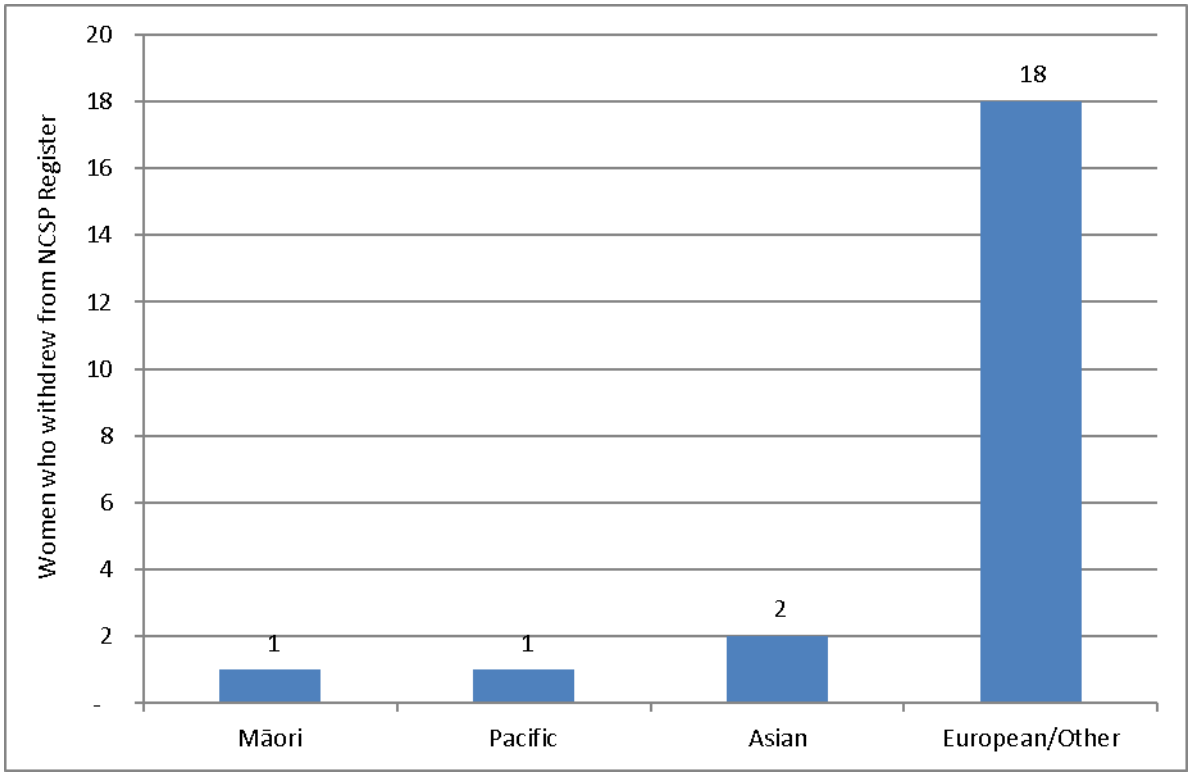


Figure 31 - Number of women (aged 20-69 years) who withdrew from the NCSP Register by ethnicity, 1 January – 30 June 2018



Indicator 4 – Early re-screening

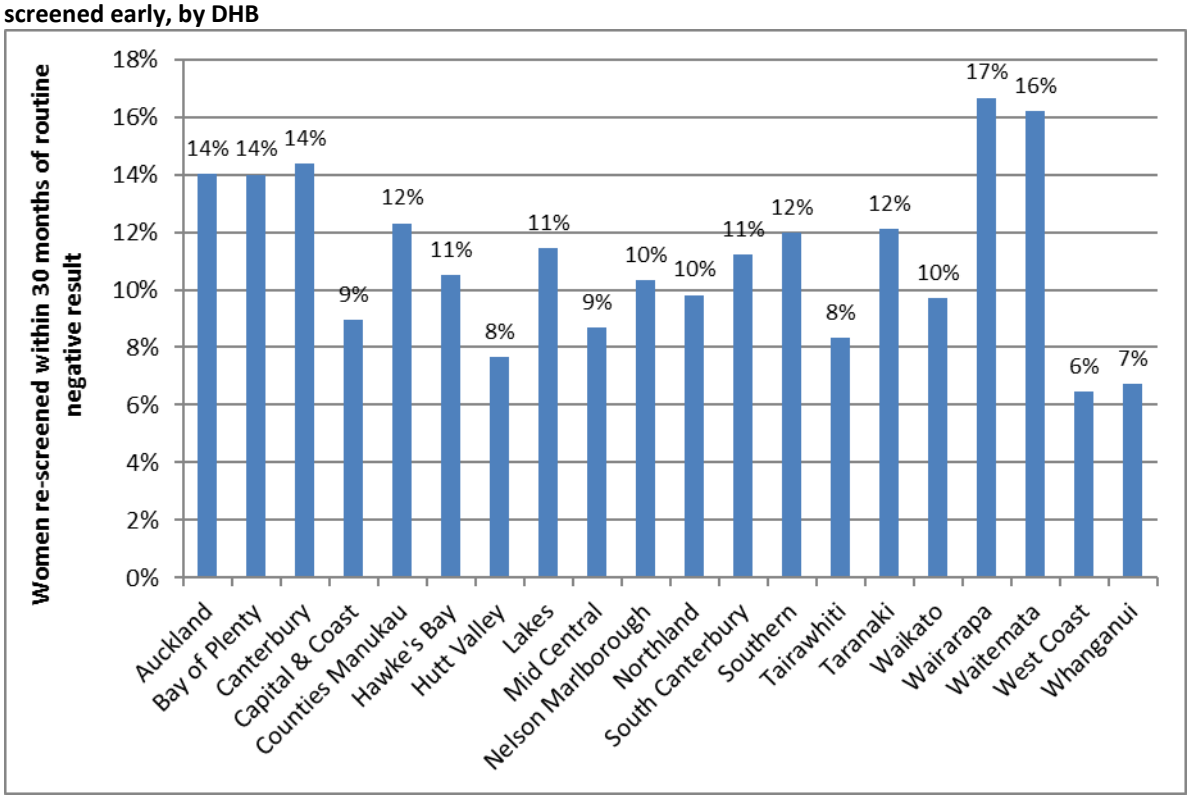
Definition	The proportion of women who returned for a smear within 30 months (2.5 years) of their index smear is calculated for a cohort of women. The cohort comprises of women with an index smear taken between 1 August – 31 September 2015 (inclusive), who i) were aged 20-66 years at the time the smear was taken (and hence remained within the screening target age throughout the period); and ii) were given a recommendation to return at the regular interval of three years as a result of their smear in February/ March 2015 (NZ Modified Bethesda code R1). Using this method of calculating the measure allows follow-up to be considered over 30 months for every individual woman. This measure excludes women who return early but are being followed according to *Guidelines for Cervical Screening in New Zealand*, for example, those with a recent report of an abnormality. It also excludes from the count of women screened early those whose "early" smear recommended urgent referral regardless of cytological findings, in view of the abnormal clinical history provided (NZ Modified Bethesda code R14). In some cases, early re-screening may be the result of women being re-screened early in response to clinical symptoms, and this is appropriate. For the purposes of analysis by age group, a woman's age is defined as her age at the end of the current monitoring period (i.e. a women's age at 30 June 2018).
Target	A target has not been set for this cohort-based calculation method.
Current Situation	There were 45,037 women who had a smear taken in August or September 2015, were aged between 20-66 years at the time of their smear and were given a recommendation to return for their next smear at the routine interval of three years. Among these women, 5,466 (12.1%) had at least one subsequent smear in the following 30 months (6 months earlier than recommended). There was wide variation in early re-screening by DHB. Early re-screening was most common in Wairarapa (16.7%) and Waitemata (16.2%), and was least common in West Coast (6.5%) (Figure 32, Table 47). There was also variability by age. Younger women (aged 20-24 years at the end of the period) were most likely to be re-screened early (15.9%) and older women (aged 65-69 years) were the least likely to be re-screened early (7.7%) (Figure 33, Table 46). Rates of early re-screening tended to decrease with increasing age but were quite similar across five-year age groups from 30 to 54 years (between 13.0% and 12.4%).

	Among the ethnic groups considered, European/ Other were the most likely to be re-screened early (12.5%), while early re-screening was least common among Pacific women (8.4%) (Figure 34, Table 48).
Trends	The level of early re-screening (12.1%) is slightly lower to what was reported in the previous monitoring period (12.6%) and has been declining over a number of reporting periods. The DHB with the highest level of early rescreening in this report was Wairarapa (16.7%) followed by Waitemata (16.2%), the same DHBs reported in the previous report. In the majority of DHBs, early rescreening is decreasing; however early rescreening increased in the current report in nine DHBs (Bay of Plenty, Counties Manukau, Hawke's Bay, Mid Central, Nelson Marlborough, Southern, Tairawhiti, Taranaki and Waikato) with the greatest increases occurring in Taranaki (2.3% increase; from 9.8% to 12.1% in the current report) followed by Tairawhiti (1.8%; from 6.5% to 8.3% in the current report). Trends over the two years ending 30 June 2018 by DHB are shown in Figure 35. A reduction in the level of early re-screening was seen for eight of the ten five-year age groups between 20 and 69 years since the previous report. A small increase was seen in one age group however: in women aged 20-24 years (from 15.3% to 15.9%) and women 40-44 remained at a similar percent between the two monitoring periods (12.9%). Trends over the two years ending 30 June 2018 by five-year age group are shown in Figure 36. Small decreases in early re-screening were also seen in four of the 5 ethnic groups. The greatest drop was seen in Pacific women (from 9.8% to 8.4%) since the last monitoring period. Decreases to a lesser extent was seen for Asian and European/ Other women. Early rescreening in Māori women increase slightly from 10.9% to 11.4% in the current report.
Comments	Early re-screening was assessed based on cytology recommendation codes, in order to exclude from the early re-screening group women with a negative smear for whom an earlier screening visit is appropriate. Thus, only women with a recommendation that their next screening visit be in three years were eligible for inclusion in the early re-screening group (that is, in both the numerator and the denominator). Women excluded from the early re-screening group would include those who just had their first smear or more than five years have elapsed since their previous smear (NCSP policy is to recommend a one-year follow-up), women with atrophic changes for whom a repeat after oestrogen is recommended, women with an abnormal history or clinical symptoms, and those already under specialist care. In some cases, early re-screening may be the result of women being re-screened early in response to clinical symptoms, and this is appropriate. We have used the NZ Modified Bethesda recommendation code for urgent referral regardless of cytological findings (R14) to try and exclude some of these cases

from the count of women re-screened early, but this does not exclude all screens performed in response to clinical symptoms.

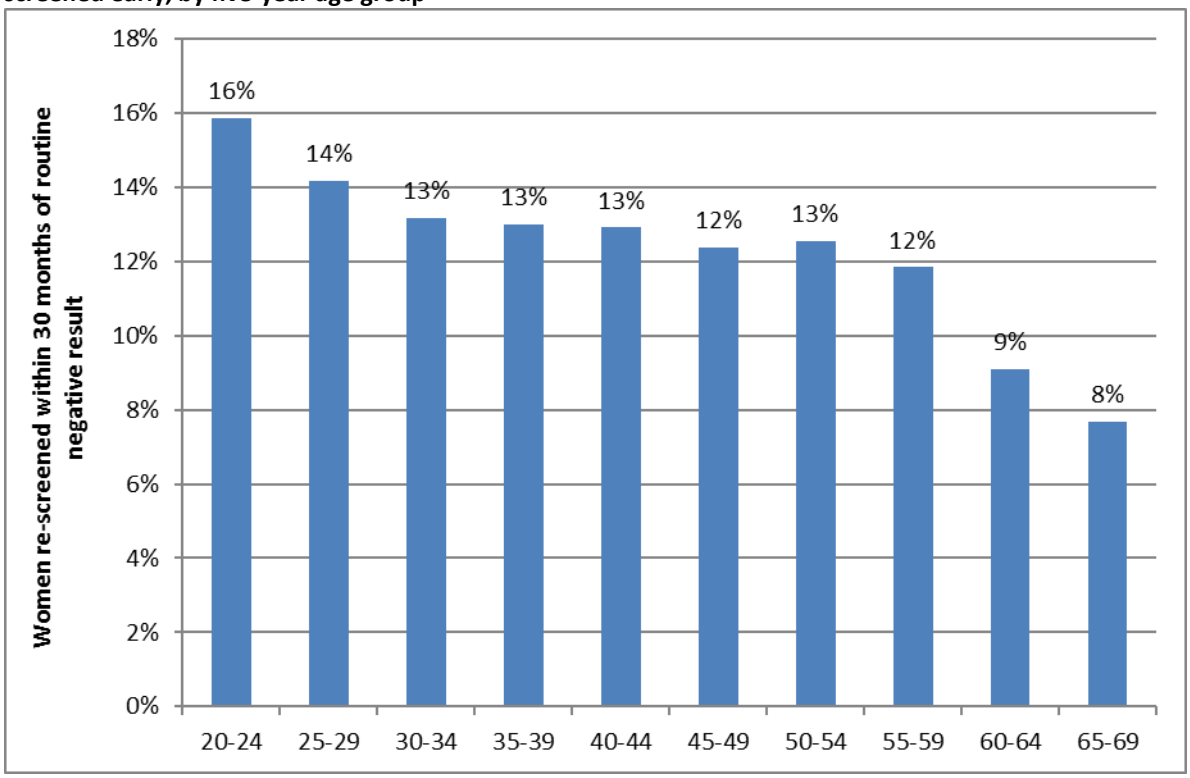
There are some similarities between Indicator 4 and Indicator 1.2, although they examine different groups of women and the proportions reported answer somewhat different questions (as is described in more detail in the *Definition* and Comments section of Indicator 1.2). Indicator 1.2 addresses the question – "*What proportion of women who are re-attending for routine screening in a particular time period are returning at least six months early?*", and does not take into account women who did not attend for screening; whereas Indicator 4 addresses the question – "*What proportion of women recommended to return in three years for routine screening return at least six months early?*", and takes into account all women given a routine screening recommendation, whether they re-attend or not.

Figure 32 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB



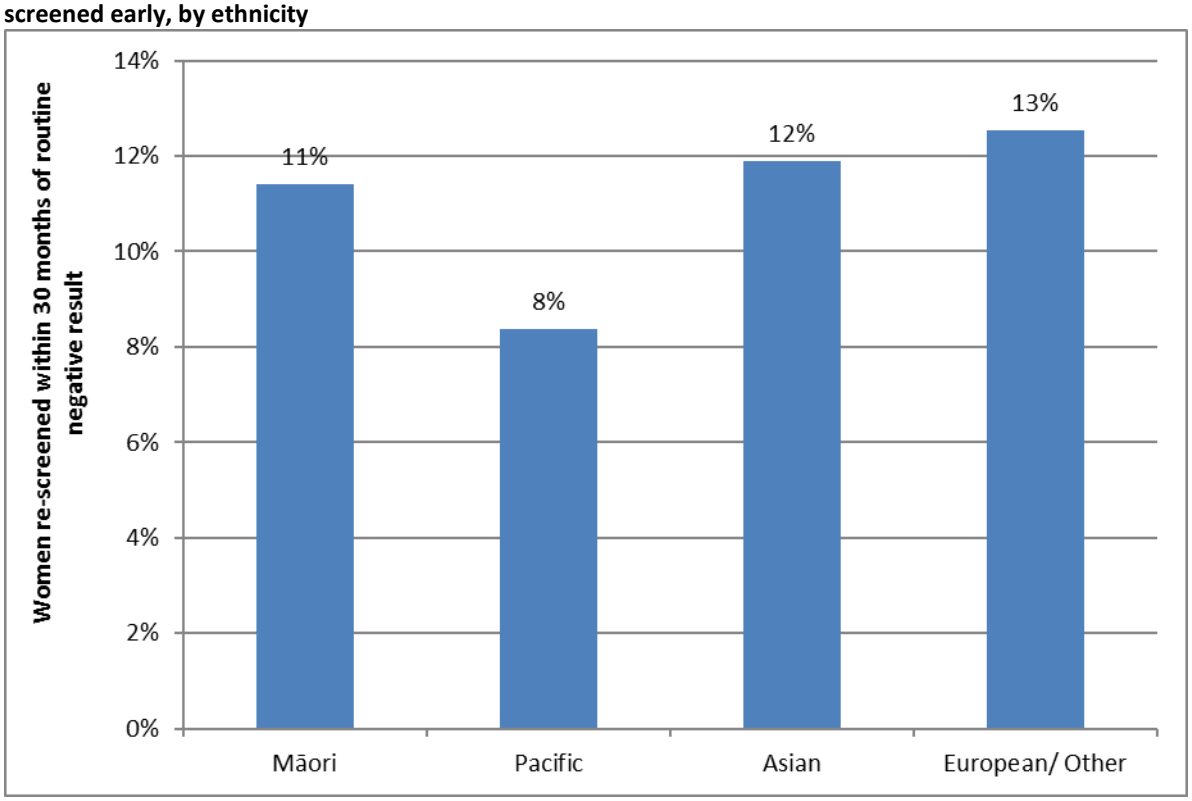
See also Table 47.

Figure 33 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by five-year age group



See also Table 46.

Figure 34 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity



See also Table 48.

Figure 35 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB

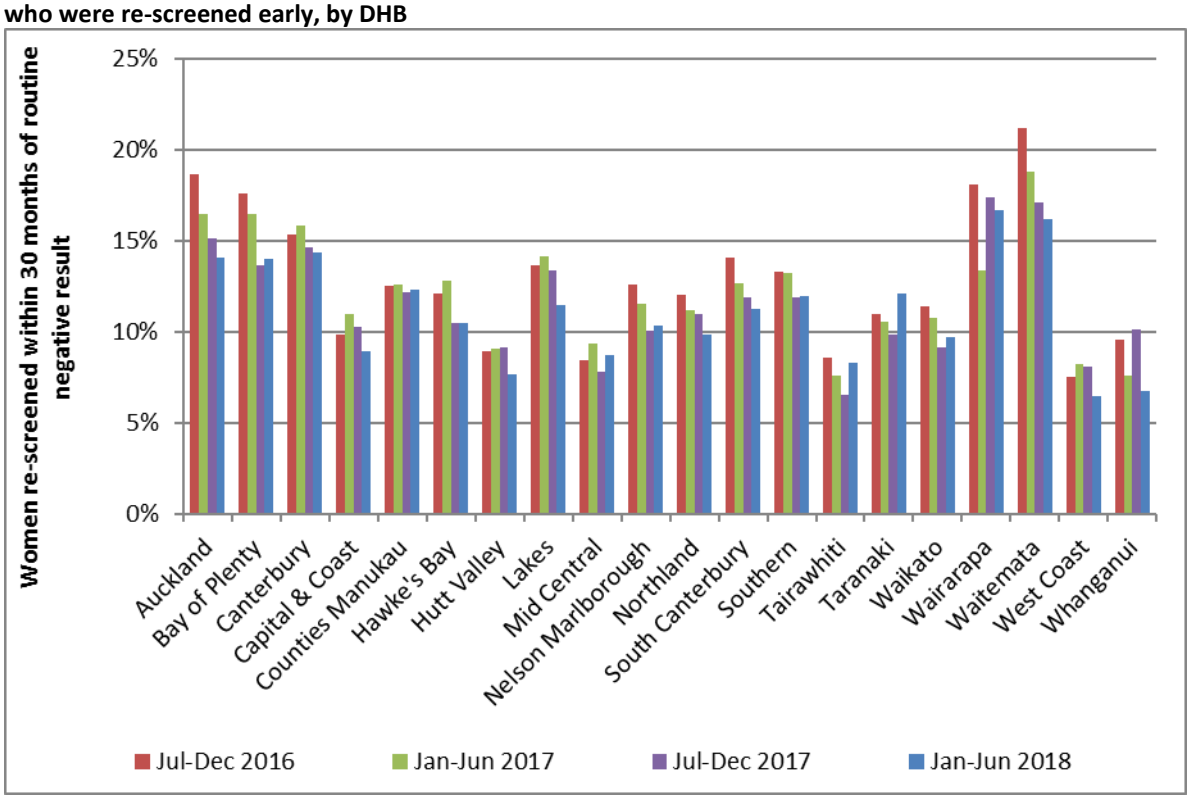


Figure 36 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by age

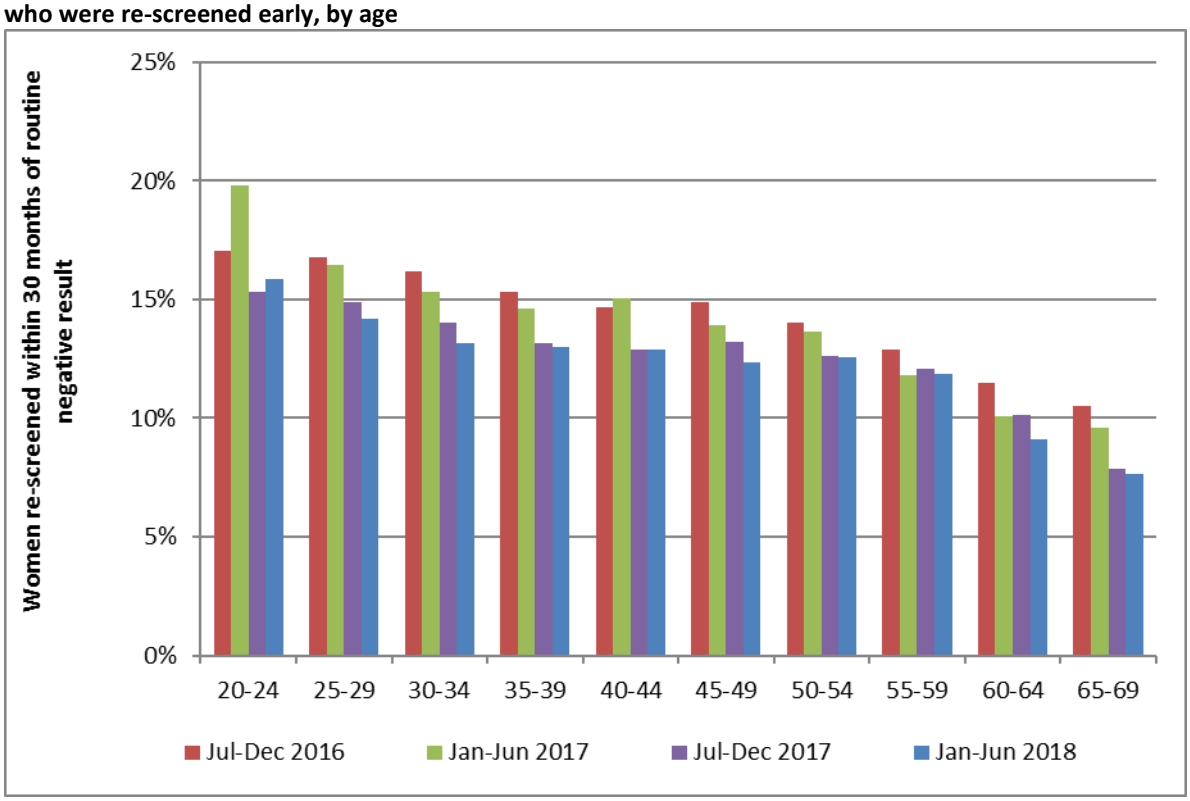
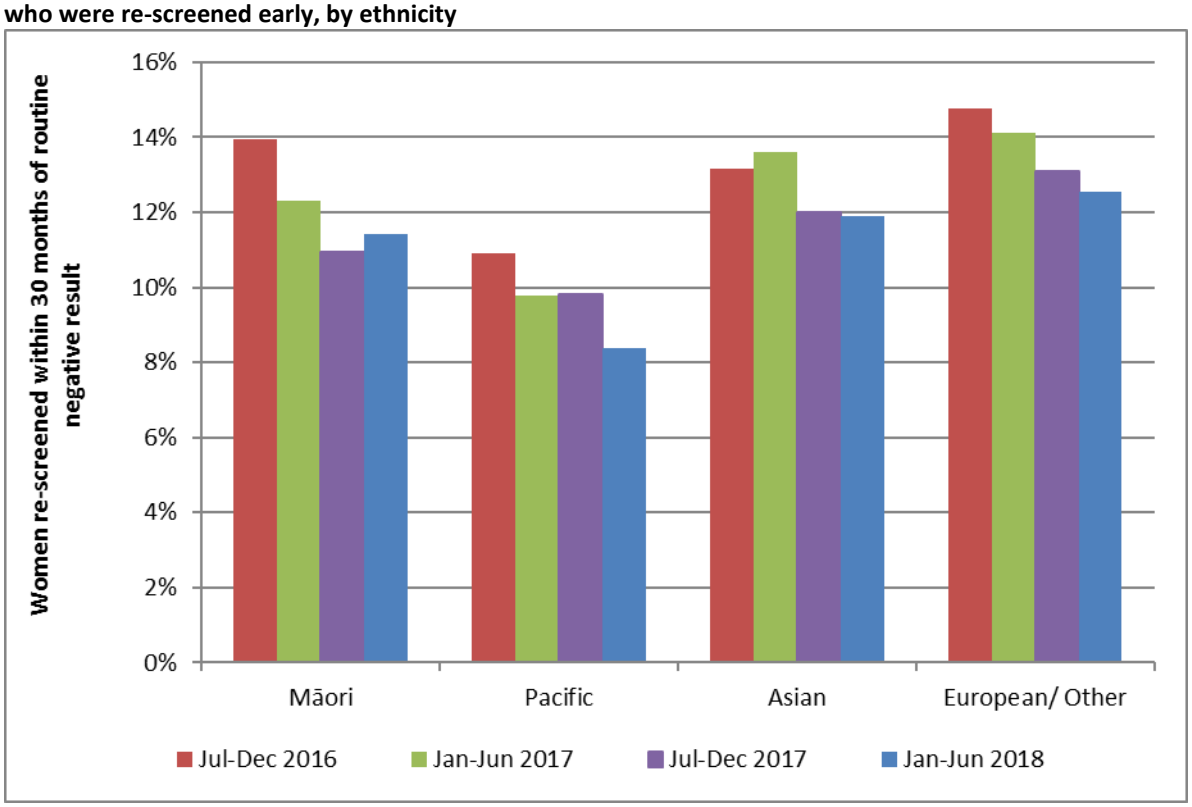


Figure 37 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity



Indicator 5 – Laboratory indicators

The indicators include cytology, histology reports (encompassing cytology and histology reporting rates, positive predictive value of cytology predicting HSIL), laboratory turnaround times, the accuracy of negative cytology reports, and unsatisfactory samples. Volumes of high-risk HPV (hrHPV) tests according to NCSP guidelines are included in Indicator 8.

Indicator 5.1 – Laboratory cytology reporting

This includes the breakdown of cytology reporting by category for squamous and glandular abnormalities reported

- Negative
- ASC-US
- LSIL
- ASC-H
- HSIL
- SC
- AGC/AIS
- Adenocarcinoma
- Malignant neoplasm
- Total abnormalities
- Unsatisfactory samples

Definition	Bethesda codes used are provided in Appendix B. The Bethesda reporting system (TBS), introduced in New Zealand on 1 July 2005, is a New Zealand modification of the Bethesda 2001 cytology reporting system. The NCSP Register collects cytology results of samples taken from the cervix and vagina. Total samples include all cytology samples (satisfactory and unsatisfactory) taken during the monitoring period. All NCSP cytology is liquid-based cytology (LBC). Reporting rates for negative cytology, total abnormal cytology, and other reporting categories are as a percentage of all satisfactory cytology samples.
Target	0.1% - 3.0% of LBC samples reported as unsatisfactory. No more than 96% of satisfactory samples reported as negative. No more than 10% of satisfactory samples reported as abnormal. No less than 0.5% of satisfactory samples reported as HSIL (Bethesda HS1 or HS2).
Current Situation	Six laboratories reported on cytology taken during the current monitoring period, the same number as in the previous monitoring period. A total of 219,259 cytology samples were taken, all of which (100%) were coded as LBC samples. ***Unsatisfactory cytology*** 2,950 cytology samples (1.3%) were unsatisfactory. The unsatisfactory rate for LBC is within the 0.1% - 3.0% target range for LBC samples. Five of the six laboratories had unsatisfactory rates within the target range; the remaining laboratory had a rate that exceeded the maximum target of 3.0% (Anatomical

Pathology Services; 3.2%). Pathlab had the lowest unsatisfactory percentage of 0.4% (Figure 38, Table 1).

Unsatisfactory samples are reported in more detail in Table 1 and Figure 38. The remaining satisfactory samples are reported on below and in more detail in Table 1 to Table 6.

Negative cytology reports

93.3% of satisfactory cytology results were negative (Table 1), consistent with the target of no more than 96%. The proportion of samples which were negative varied by laboratory from 77.4% (LabPLUS) to 95.3% (Southern Community Laboratories) (Figure 39). All six laboratories met the target of no more than 96%.

Abnormal cytology reports

Nationally, the proportion of satisfactory samples which were abnormal (6.7%) met the target of no more than 10% (Figure 40, Table 2). This varied by laboratory, from 4.7% (Southern Community Labs) to 22.6% (LabPLUS) (Figure 40). Two laboratories (LabPLUS and Canterbury Health Laboratories) exceeded the target (22.6% and 10.3%, respectively).

Abnormal cytology results were most common in younger women and LSIL was the most common abnormal result (Table 5, Table 6).

HSIL cytology reports

Overall, 0.8% of satisfactory cytology samples were HSIL, consistent with the target of at least 0.5% of samples (Table 4). Rates varied by laboratory from 0.5% (Pathlab) to 2.3% (LabPLUS). All six laboratories met the HSIL target (Table 4, Figure 41).

Among women aged 20-69 years, rates of HSIL or worse were most common in women aged 25-29 years (Table 5, Table 6).

In the current report we additionally examined age-standardised rates of HSIL cytology reports. This was done to partially account for different rates which may arise in different laboratories due to differences in the age of the population whose cytology tests they process. The age-standardised HSIL rates were very similar to the crude rates, both nationally and within each laboratory, but tended to be slightly lower (Table 49).

Trends

Unsatisfactory cytology

Overall, the percentage of unsatisfactory LBC samples for the current monitoring period (1.3%) is similar to that seen in the previous monitoring period (1.4%). One laboratory (Anatomical Pathology Services) has remained above the upper target of 3.0% for the last four monitoring periods.

Negative vs abnormal cytology reports

The proportion of satisfactory cytology samples which are negative for intraepithelial lesion or malignancy (93.3%) is similar to the previous

monitoring period (93.5%), and correspondingly the proportion of cytology samples reported as abnormal (6.7%) is also similar as in the previous monitoring period (6.5%). All six laboratories continued to meet the target for negative cytology. The same laboratories as previous reports had abnormal cytology rates above the target of 10% (Canterbury Health Laboratories and LabPLUS).

HSIL cytology reports

The proportion of satisfactory cytology samples reported as HSIL (0.8%) is similar to that reported in the previous monitoring report (0.7%). All six laboratories met the target, which was the same number of laboratories that achieved the target in the previous report.

Longer term trends in the proportion of satisfactory cytology samples reported as HSIL are shown in Figure 42, Figure 43 (trends by age) and Figure 44 (trends by laboratory). Figure 42 and Figure 44 show trends over the last four monitoring report periods (two years), consistent with other trends presented in this report. Figure 43 shows longer term trends (1 July 2008 to 30 June 2018) in rates of HSIL cytology by age. The younger age groups in this figure would be the first to be potentially affected by HPV vaccination (the oldest birth cohorts eligible for vaccination through the publicly funded programme would be aged up to 28 years at the time of the current monitoring period). HSIL rates in women aged less than 20 years are quite variable; this is likely to be because far fewer women of this age group attend for screening, since routine screening is not recommended for women aged less than 20 years. HSIL reporting rates in women aged 20-24 years had been increasing prior to 2013 and reached a high of 2.2% for the July-December 2012 period (Report 38). HSIL rates then fell for four monitoring periods between January 2013 and December 2014. In the July-December 2015 monitoring period (Report 44) an increase was seen in virtually all age groups, including women aged 20-24 years (from 1.6% in January to June 2015, Report 43, to 2.0% in July to December 2015, Report 44), however this increase appeared to be driven by an increase in the percentage of satisfactory samples reported as HSIL at two laboratories (Anatomical Pathology Services and Southern Community Laboratories; which together accounted for 65.2% of all satisfactory cytology), and a coinciding decrease in the positive predictive value of HSIL + SC cytology for histologically-confirmed CIN2+ within six months from these two laboratories. Since then, there has been a consistent decline in HSIL rates observed over the last four monitoring reports up to December 2017, with rates being below what they were prior to the increase in the latter half of 2015 especially for women 20-24 years and 25-29 years. For women aged 20-24 years HSIL reporting rates remain lower than the latter half of 2008 (around the time that the HPV vaccination programme began). In this report small increases were seen in women aged 25-29 (increase of 0.2%). All other changes were very small being no more than 0.1% for women aged 20-24 and 30-69 years of age.

Comments

High rates of abnormal samples from LabPLUS are consistent with previous reports, and as discussed in previous monitoring reports, investigation into this has shown that the case-mix of this laboratory (i.e. a significant proportion of

samples received from colposcopy clinics compared to other laboratories) is an underlying factor.

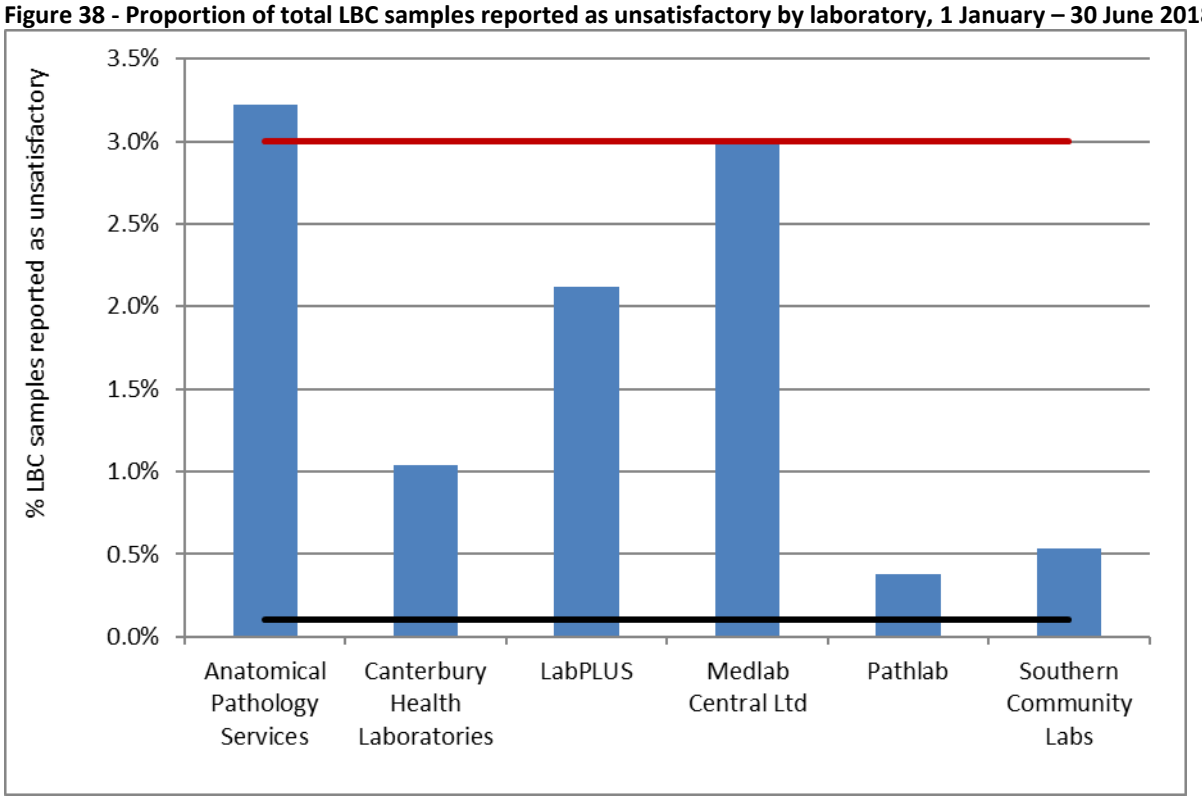
Workload catchments for laboratories may be regional or nationwide and may change because of laboratory service restructuring. As a result, it is not always straightforward to determine the catchment population for a laboratory. Rates of negative and abnormal results for individual laboratories therefore need to be interpreted with some care, to allow for this difference in workloads and case-mix.

The national Human Papillomavirus (HPV) Immunisation Programme was introduced in New Zealand in September 2008, and involves routine vaccination of girls 12-13 years and catch-up vaccination has previously been offered to young women born in 1990 or later. International and New Zealand data indicate that most high-grade squamous cytology reports are associated with HPV types which are potentially preventable by vaccination (approximately 53% by first generation vaccines against HPV16/18; >70% with 9-valent vaccines),[7-10] and that this is particularly true for younger women.[7, 11-13] It is anticipated that data will also soon be available from New Zealand to further quantify the potential impact of the Human Papillomavirus Immunisation Programme in New Zealand. As vaccinated cohorts enter the screening programme, it is anticipated that the proportion of satisfactory cytology samples reported as HSIL will gradually reduce, and that this will occur in younger age groups first (the oldest birth cohorts eligible for vaccination through the publicly funded programme would be aged up to 28 years at the time of the current monitoring period, while the oldest birth cohorts offered vaccination at the target age of 12-13 years would be aged up to 22 years). Therefore, trends in the proportion of satisfactory cytology samples reported as HSIL by age are included in these monitoring reports, in order to monitor the impact of HPV vaccination over time. This proportion of satisfactory cytology samples reported as HSIL in the 20-24 years age group in the current report the lowest it has been since the latter half of 2008 (around the time that the HPV vaccination programme began), and is consistent with an HPV vaccine effect. At the current time, it is not possible to present HSIL rates separately for vaccinated and unvaccinated women, because information relating to whether or not individual women have been vaccinated is not available on the NCSP Register. This data therefore needs to be interpreted with some care, as they include results in all women, both vaccinated and unvaccinated.

In the current report we additionally examined age-standardised rates of HSIL cytology reports, in order to partially account for differences in the age of the population whose cytology tests each laboratory processes. This could be an additional factor in some laboratories having higher or lower HSIL reporting rates. As the target does not specifically relate to age-standardised rates, these results cannot be directly compared to the target; however, as the target was set in 2013, standardising was done using the 2013 Census population (females). As the age-standardised HSIL rates were very similar to the crude rates within each laboratory, differences in age distribution of cytology tests

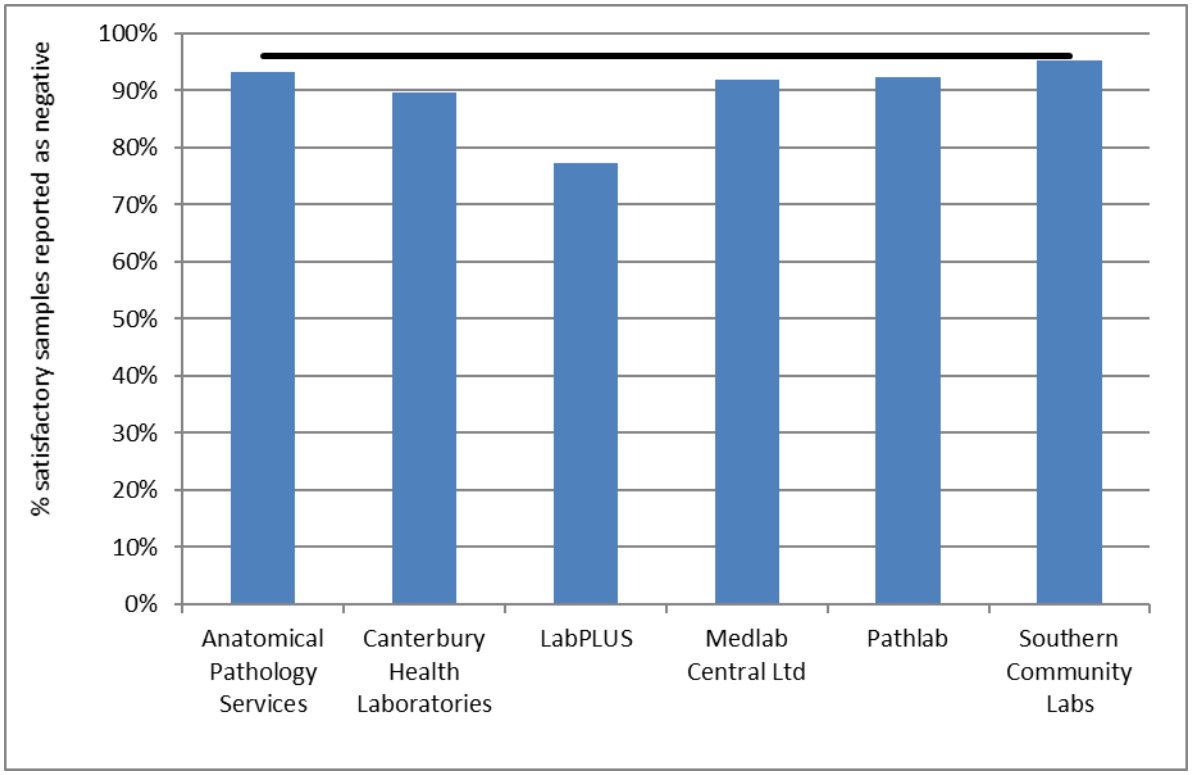
reported do not appear to be a factor in differences between laboratories in HSIL reporting rates, or in why some laboratories are outside the target range.

Figure 38 - Proportion of total LBC samples reported as unsatisfactory by laboratory, 1 January – 30 June 2018



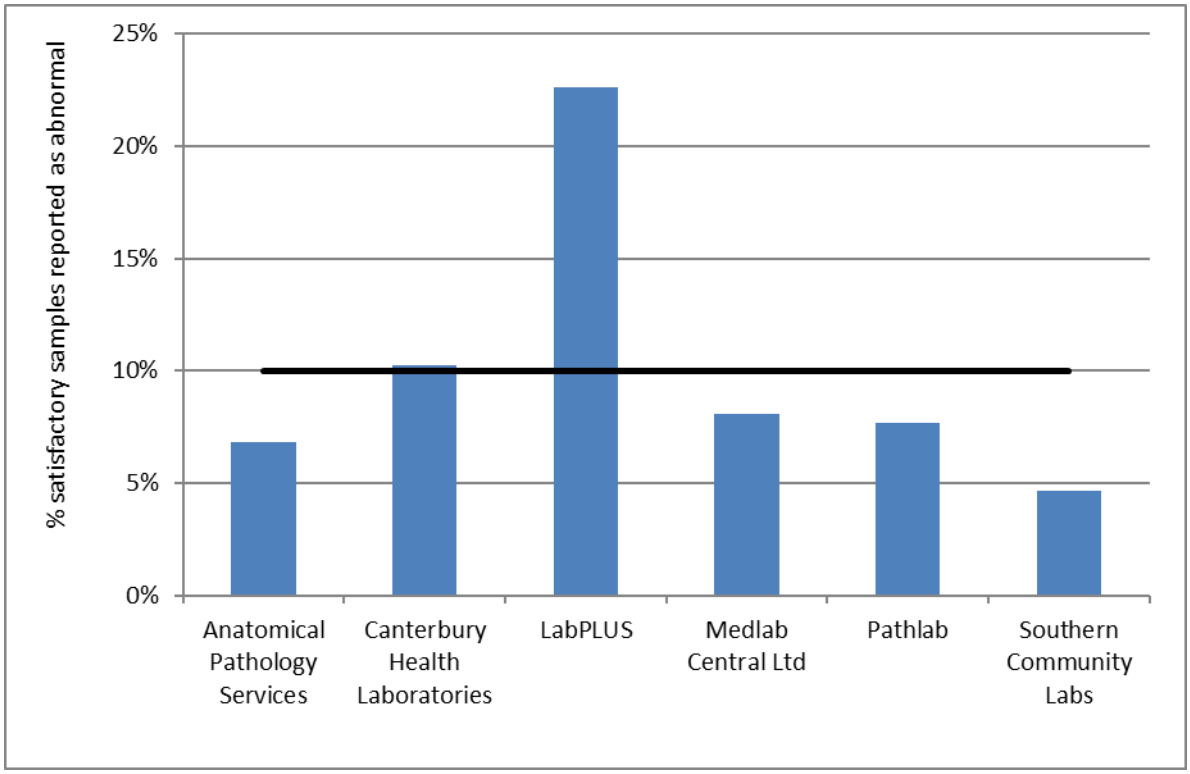
Target for LBC: 0.1-3.0% (Red line-upper target limit; black line=lower target limit)

Figure 39 - Proportion of total satisfactory samples reported as negative by laboratory, 1 January – 30 June 2018



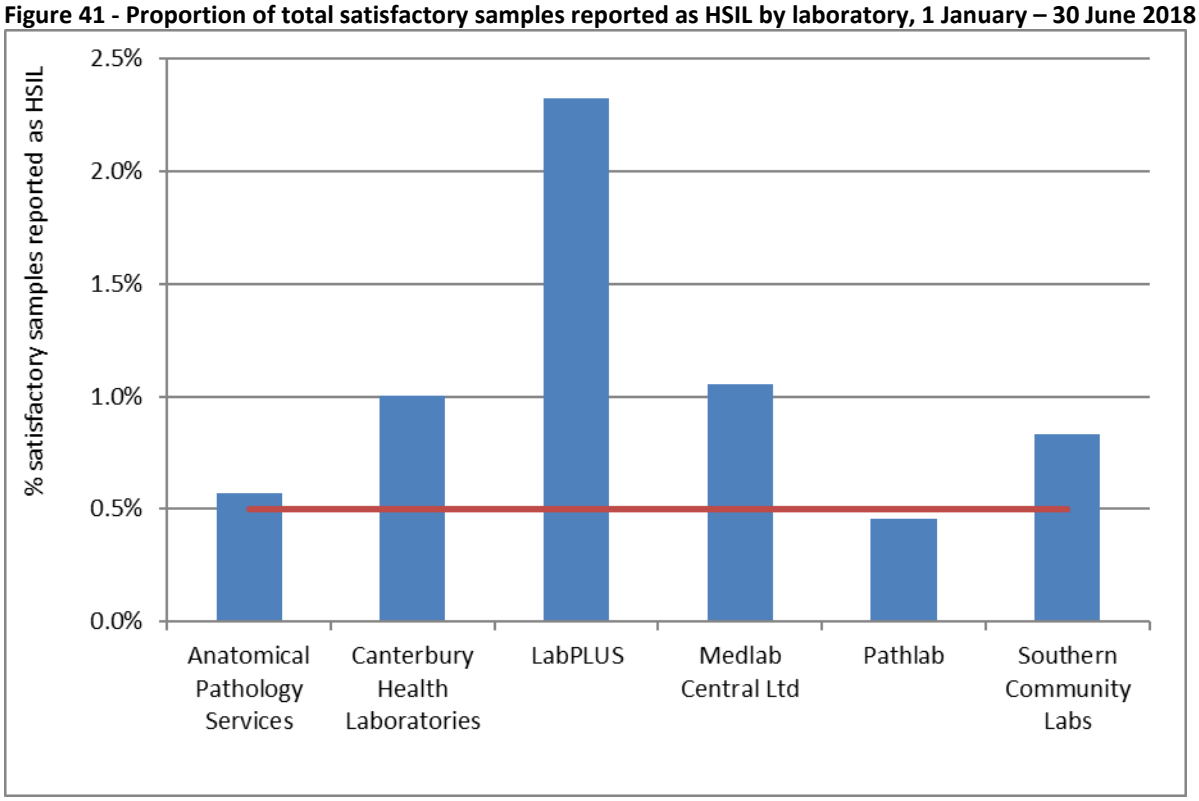
Note: Line shows negative target of no more than 96%

Figure 40 - Proportion of total satisfactory samples reported as abnormalities by laboratory, 1 January – 30 June 2018



Note: Line shows abnormal target of no more than 10%

Figure 41 - Proportion of total satisfactory samples reported as HSIL by laboratory, 1 January – 30 June 2018



Note: Line shows HSIL target of no less than 0.5%

Table 1 - Satisfactory and unsatisfactory cytology reporting by laboratory (1 January – 30 June 2018)

	All samples	Satisfactory		Unsatisfactory	
Laboratory	**N**	**N**	**%**	**N**	**%**
Anatomical Pathology Services	46,159	44,670	96.8	1,489	3.2
Canterbury Health Laboratories	10,592	10,482	99.0	110	1.0
LabPLUS	8,400	8,222	97.9	178	2.1
Medlab Central Ltd.	15,885	15,406	97.0	479	3.0
Pathlab	28,163	28,056	99.6	107	0.4
Southern Community Laboratories	110,060	109,473	99.5	587	0.5
Total	**219,259**	**216,309**	**98.7**	**2,950**	**1.3**

Target total unsatisfactory: 0.1%-3.0% reported as unsatisfactory

Table 2 - Laboratory cytology reporting by general result (1 January – 30 June 2018) – percentage of satisfactory samples

	Negative		Abnormal	
Laboratory	**N**	**%**	**N**	**%**
Anatomical Pathology Services	41,633	93.2	3,037	6.8
Canterbury Health Laboratories	9,406	89.7	1,076	10.3
LabPLUS	6,361	77.4	1,861	22.6
Medlab Central Ltd.	14,164	91.9	1,242	8.1
Pathlab	25,899	92.3	2,157	7.7
Southern Community Laboratories	104,351	95.3	5,122	4.7
Total	**201,814**	**93.3**	**14,495**	**6.7**

Target total negative: ≤ 96% reported as negative
Target total abnormal: ≤ 10% reported as abnormal

Table 3 - Laboratory cytology reporting by type of cytological category (1 January – 30 June 2018) – counts of all satisfactory samples

	Result									
Laboratory	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
Anatomical Pathology Services	41,633	901	1,669	156	254	4	45	8	-	44,670
Canterbury Health Laboratories	9,406	318	510	129	105	-	9	4	1	10,482
LabPLUS	6,361	630	760	253	191	1	20	5	1	8,222
Medlab Central Ltd.	14,164	423	499	129	162	1	22	5	1	15,406
Pathlab	25,899	689	1,174	139	128	2	22	2	1	28,056
Southern Community Laboratories	104,351	897	2,963	214	909	10	109	17	3	109,473
Total	**201,814**	**3,858**	**7,575**	**1,020**	**1,749**	**18**	**227**	**41**	**7**	**216,309**

Table 4 - Laboratory cytology reporting by cytological category (1 January – 30 June 2018) – percentage of all satisfactory samples

	Result								
Laboratory	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**
Anatomical Pathology Services	93.2	2.0	3.7	0.3	0.6	0.01	0.10	0.02	-
Canterbury Health Laboratories	89.7	3.0	4.9	1.2	1.0	-	0.09	0.04	0.01
LabPLUS	77.4	7.7	9.2	3.1	2.3	0.01	0.24	0.06	0.01
Medlab Central Ltd.	91.9	2.7	3.2	0.8	1.1	0.01	0.14	0.03	0.01
Pathlab	92.3	2.5	4.2	0.5	0.5	0.01	0.08	0.01	<0.005
Southern Community Laboratories	95.3	0.8	2.7	0.2	0.8	0.01	0.10	0.02	<0.005
Total	**93.3**	**1.8**	**3.5**	**0.5**	**0.8**	**0.01**	**0.10**	**0.02**	**<0.005**

Target: HSIL ≥ 0.5% reported as HSIL

Table 5 - Laboratory reporting of cytological category by five-year age group (1 January – 30 June 2018) – counts of all satisfactory samples

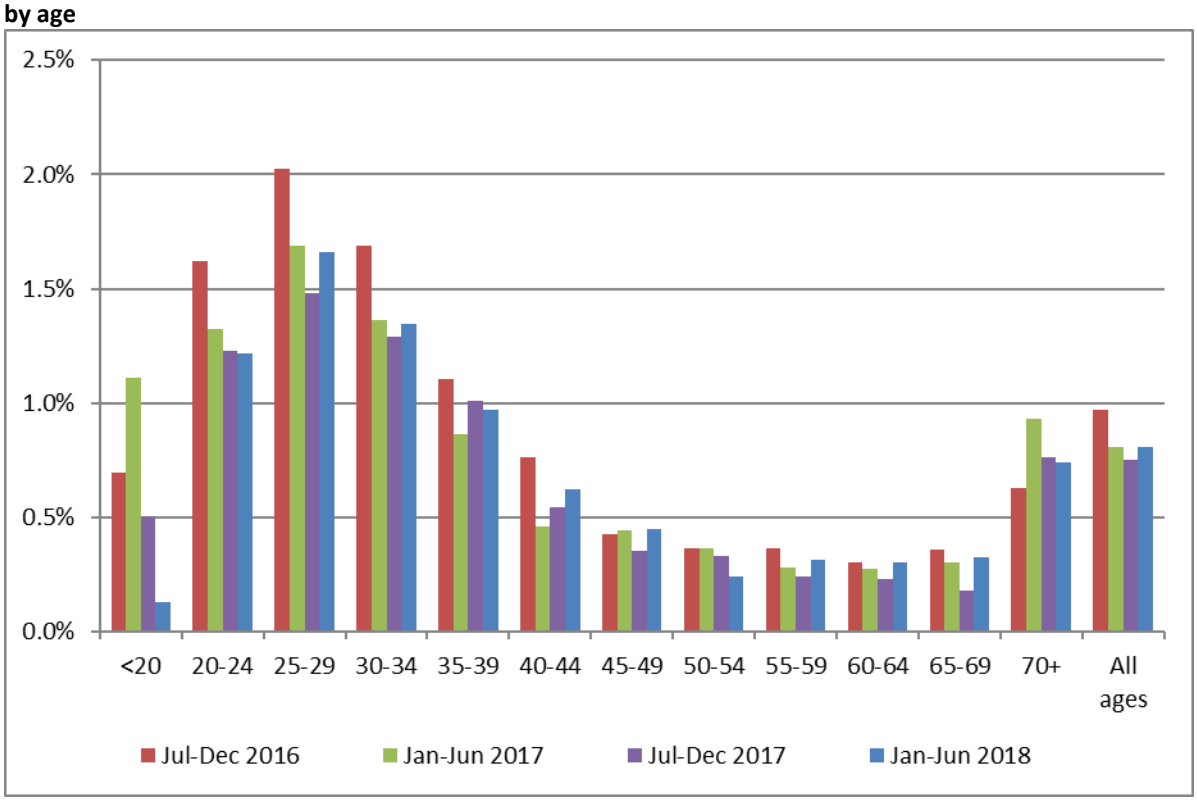
	Cytology Result									
Age Group	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
<20	649	19	121	3	1	-	-	-	-	793
20-24	20,572	683	2,434	203	295	-	1	-	-	24,188
25-29	22,789	581	1,381	197	422	-	17	-	-	25,387
30-34	23,522	479	845	178	342	3	19	-	-	25,388
35-39	22,028	373	597	101	226	1	17	1	-	23,344
40-44	21,437	370	482	69	140	4	19	-	-	22,521
45-49	22,766	409	495	62	107	-	30	2	2	23,873
50-54	20,416	347	379	60	51	3	31	7	2	21,296
55-59	19,032	243	375	62	62	-	25	6	1	19,806
60-64	14,998	175	250	42	47	3	23	5	1	15,544
65-69	11,629	131	143	32	39	-	23	10	1	12,008
70+	1,976	48	73	11	16	4	22	10	-	2,160
Total	**201,814**	**3,858**	**7,575**	**1,020**	**1,748**	**18**	**227**	**41**	**7**	**216,308**

Note: excludes test results for one woman where date of birth was not available

Table 6 - Laboratory reporting of cytological category by five-year age group () – percentage of all satisfactory samples in women of that age group

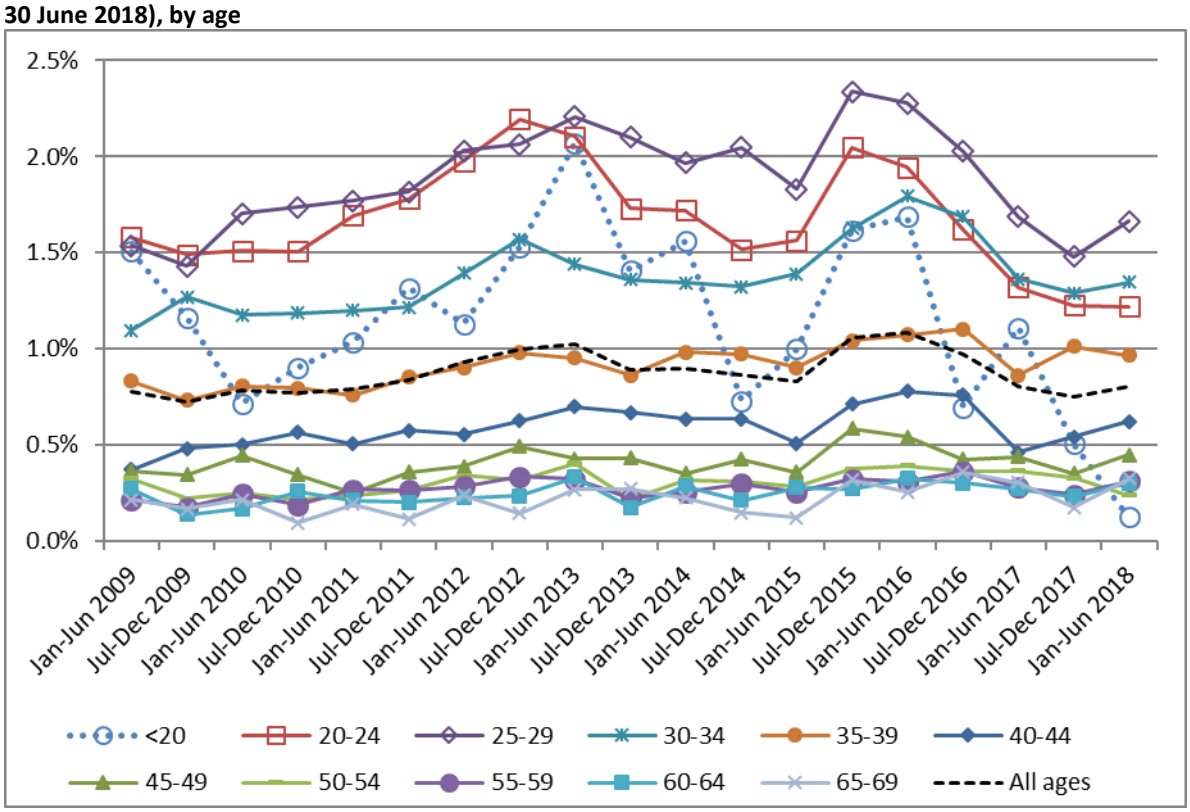
	Cytology Result								
Age Group	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**
<20	81.8	2.4	15.3	0.4	0.1	-	-	-	-
20-24	85.1	2.8	10.1	0.8	1.2	-	<0.005	-	-
25-29	89.8	2.3	5.4	0.8	1.7	-	0.07	-	-
30-34	92.7	1.9	3.3	0.7	1.3	0.01	0.07	-	-
35-39	94.4	1.6	2.6	0.4	1.0	<0.005	0.07	<0.005	-
40-44	95.2	1.6	2.1	0.3	0.6	0.02	0.08	-	-
45-49	95.4	1.7	2.1	0.3	0.4	-	0.13	0.01	0.01
50-54	95.9	1.6	1.8	0.3	0.2	0.01	0.15	0.03	0.01
55-59	96.1	1.2	1.9	0.3	0.3	-	0.13	0.03	0.01
60-64	96.5	1.1	1.6	0.3	0.3	0.02	0.15	0.03	0.01
65-69	96.8	1.1	1.2	0.3	0.3	-	0.19	0.08	0.01
70+	91.5	2.2	3.4	0.5	0.7	0.19	1.02	0.46	-
Total	**93.3**	**1.8**	**3.5**	**0.5**	**0.8**	**0.01**	**0.10**	**0.02**	**<0.005**

Figure 42 - Trends in the proportion of total satisfactory samples reported as HSIL (last four monitoring periods), by age



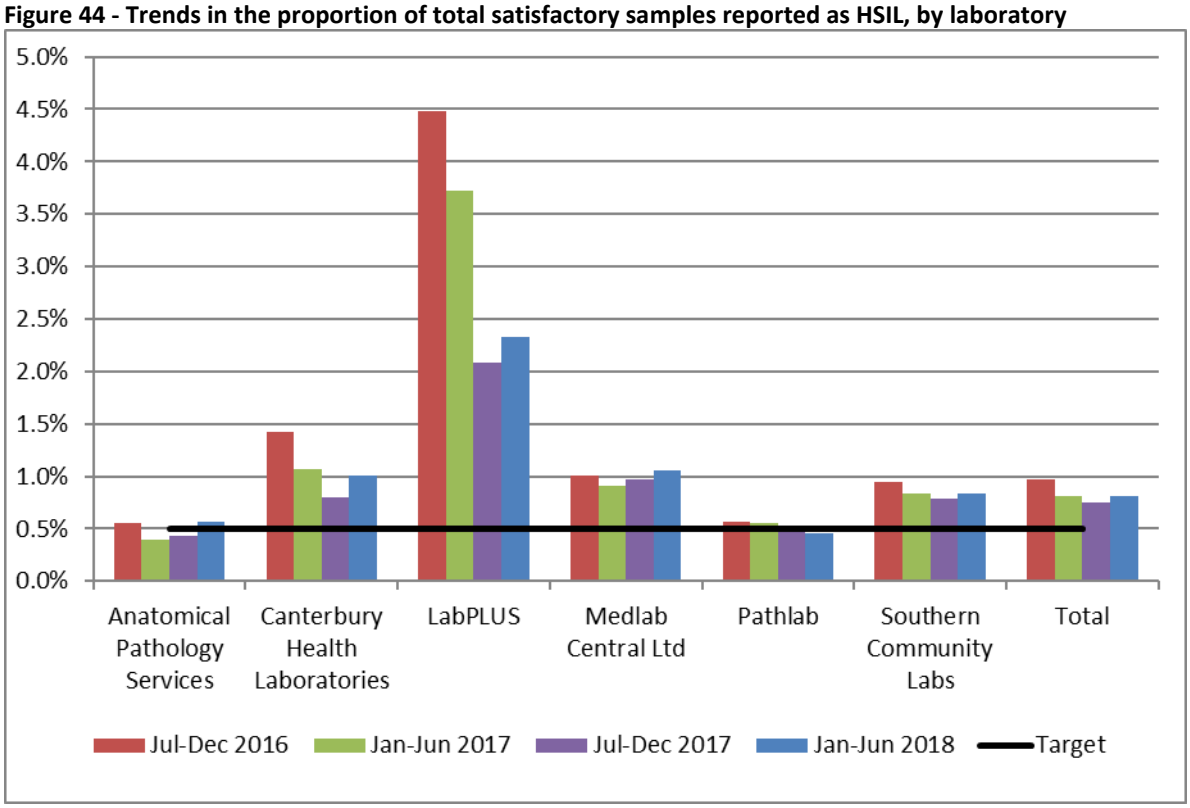
Note: women aged less than 20 years are not routinely screened

Figure 43 - Longer term trends in the proportion of total satisfactory samples reported as HSIL (to 1 January – 30 June 2018), by age



Note: women aged less than 20 years are not routinely screened

Figure 44 - Trends in the proportion of total satisfactory samples reported as HSIL, by laboratory



Note: Line shows HSIL target of no less than 0.5%.

Indicator 5.2 – Accuracy of cytology predicting HSIL

Definition	The accuracy of cytology predicting HSIL/SC (positive predictive value; PPV) is defined as the probability of a high-grade histological report (CIN 2/3 or higher) given an HSIL/invasive squamous carcinoma cytology report. Refer to Appendix D for detailed definitions of histological confirmation. All satisfactory cytology samples collected in the six months prior to the current monitoring period (i.e. collected from 1 July – 31 December 2017 inclusive) were identified. In the current report, cytology samples were excluded if they were collected at a colposcopy visit (assessed by excluding cytology samples collected at the same facility and on the same date as either a colposcopy or a histology sample in the same woman; "excluding samples from colposcopy"). In previous reports, this restriction had not been applied ("original method"). Where a woman had multiple samples, or a cytology report had multiple interpretation codes, the most serious cytology result category reported was used. If there were two cytology test results for a woman of the same grade, the earliest one was used. Up until this report (original method), histology samples taken up to five days prior to and up to six months after the cytology sample were then retrieved for women with a high-grade cytology report. From this report onwards, histology samples taken up to six months after the cytology sample were included (histology prior to or on the same day as cytology are now excluded from the analysis). Where there were multiple histology reports for a woman in the period, the most serious abnormality category was used.
Target	Not less than 65% and not greater than 85% for cytology reported as HSIL or SC.
Current Situation	***HSIL + SC*** When cytology samples collected at colposcopy were excluded, 935 women with HSIL or SC cytology reports were identified. 63 of these women (6.7%) had no histology taken in the six months after the cytology sample was taken. Among the remaining 872 for whom there was histology, 699 (80.2%) had their HSIL or SC cytology report confirmed as high-grade by histology (Figure 45, Table 50). By laboratory, the proportion of HSIL + SC being confirmed as high-grade by histology ranged from 77.4% for Anatomical Pathology Services to 85.9% for Medlab Central Ltd. All six laboratories achieved the minimum target of at least 65% of cytological HSIL + SC being confirmed by histology. One of the six laboratories exceeded the 85% upper target margin of HSIL + SC being histologically confirmed (Medlab Central Ltd; Figure 45, Table 50). Comparison of the results from the updated method excluding samples from colposcopy and the original method can be seen in Figure 46 and Table 51. In

most laboratories, positive predictive value was relatively unaffected, but decreased at two laboratories (Canterbury Health Laboratories and LabPLUS). Detailed results based on the original method are reported in Table 52.

Other cytological abnormalities

Similar calculations for positive predictive value were performed for ASC-H; glandular abnormalities (AG1-AG5, AIS, AC1-AC4); and the combination of ASC-H, HSIL and SC. There are no targets for these measures.

ASC-H

After excluding samples from colposcopy, 667 women with a cytology report of ASC-H were identified. 111 (16.6%) had no histology taken in the period up to six months after the cytology sample. Among the remaining 556 women, 308 (55.4%) were histologically confirmed as high-grade. This proportion varied by laboratory, from 53.2% (LabPLUS) to 62.7% (Canterbury Health Laboratories) (Figure 47,Table 53).

Comparison of the results from the updated method excluding samples from colposcopy and the original method can be seen in Figure 47 and Table 51. In four laboratories, positive predictive value increased for ASC-H (Anatomical Pathology Services, LabPLUS, Pathlab, Southern Community Labs), and in two laboratories it decreased (Canterbury Health Laboratories, Medlab Central). The decreases were relatively small (less than two percentage points), whereas the increases tended to be larger and more variable (ranging from 3.3 to 11.2 percentage points). Detailed results based on the original method are reported in Table 54.

ASC-H + HSIL + SC

After excluding samples from colposcopy, a total of 1602 women had a cytology report of ASC-H, HSIL or SC. 174 (10.9%) women had no histology taken in the period up to six months after the cytology sample. Among the remaining 1428 women, 1,007 (70.5%) were histologically confirmed as high-grade. This proportion varied by laboratory, from 62.2% (LabPLUS) to 74.1% (Southern Community Laboratories Dunedin) (Figure 48, Table 55).

Comparison of the results from the updated method excluding samples from colposcopy and the original method can be seen in Figure 48 and Table 51. The positive predictive value for ASC-H+HSIL+SC was somewhat lower with the updated method for five laboratories but was somewhat higher at one laboratory (Anatomical Pathology Services). Detailed results based on the original method are reported in Table 56.

Glandular abnormalities

After excluding samples from colposcopy, there were 176 women with a glandular abnormality (AG1-AG5, AIS, AC1-AC4) identified. 52 women (29.5%) had no histology taken in the period up to six months after the cytology sample. Among the remaining 124 women, 62 (50.0%) were identified as having high-grade histology. This was not analysed by laboratory, as the number of samples reported on by some laboratories was small. These results

from the updated method excluding samples from colposcopy compares with the original method as follows: 227 women identified with a glandular abnormality, 71 (31.3%) of whom had no histology taken in the period from five days prior to six months after the cytology sample; among the remaining 156 women, 80 (51.3%) were identified as having high-grade histology. Therefore the overall PPV for glandular abnormalities was relatively similar for both methods.

Overall comparison of PPV for updated method (excluding samples from colposcopy) vs original method

In most laboratories, the PPV decreased for HSIL + SC results when cytology samples collected at colposcopy were excluded, but increased for ASC-H (Table 51). The improvement in ASC-H is largely because excluding cytology collected at colposcopy meant that some women moved from the HSIL category (based on the results of a cytology test collected at colposcopy), to the ASC-H category (the referring cytology result). In the original analysis, these women were included in the HSIL group (because the most severe cytology diagnosis is used when there are multiple cytology results). As shown in Table 57, women who moved into the ASC-H category, and out of the HSIL category (because the HSIL was based on cytology at collected colposcopy), overwhelmingly were those women with HSIL-confirmed histology (66 out of 71 women). This explains the increase in the PPV of ASC-H observed at most laboratories when cytology collected at colposcopy was excluded. Both the movement out of HSIL into ASC-H, and the exclusion of women whose only HSIL cytology result was one collected at colposcopy (both of whom were very likely to have HSIL-confirmed histology) explains why laboratories generally had a lower PPV when cytology collected at colposcopy was excluded.

Trends

The method for selecting cytology and histology tests for inclusion in this calculating this indicator changed in this monitoring period, but to allow for some continuation in monitoring trends, results based on the original method will be compared with previous monitoring periods.

HSIL + SC

Positive predictive value for HSIL and SC cytology has increased when compared to the previous monitoring report (80.4% in the previous period; 82.3% in the current period). As in the previous monitoring period, all six laboratories had greater than 65% of their HSIL + SC cytology results confirmed by histology. The number of laboratories with PPVs above the upper target of 85% has increased from one to three. The proportion of cytology reports with histology available following HSIL or SC results is similar (92.9% in the current report; 92.2% in the previous report). Trends in the positive predictive value for HSIL and SC cytology by laboratory are shown in Figure 49 and Figure 50. Increases in the positive predictive value for HSIL and SC cytology were evident for all laboratories except Anatomical Pathology Services and Medlab Central Ltd (the latter of which was already above the upper target 85%).

ASC-H

Positive predictive value for ASC-H cytology has increased, from 48.3% to 50.9%, however there is no target for this measure. The proportion of ASC-H cytology reports with histology available has increased in the current report compare to the previous monitoring report (80.3% in current report; 81.5% in previous report; Figure 50). Increases in the positive predictive value for ASC-H cytology were evident in four laboratories of the six.

ASC-H + HSIL + SC

The positive predictive value for the combined group ASC-H, HSIL and SC has increased slightly in the current report (to 71.1%, compared to 69.5% in the previous report). Note that there is no target for the positive predictive value of this combined group. Trends in the positive predictive value for the combined group ASC-H, HSIL and SC cytology by laboratory are shown in Figure 52. Decreases in the positive predictive value for the combined group of ASC-H, HSIL and SC cytology were evident for three of six laboratories.

Glandular abnormalities

The positive predictive value of glandular abnormalities increased (from 40.6% in the previous report to 51.3% in the current report). Compared to both ASC-H cytology, and the combined group of HSIL and SC cytology, there are far fewer glandular abnormalities, and an even smaller number with histology available. The proportion of glandular abnormalities with histology available (68.7%) is higher in this report than the previous monitoring period (67.8%), and remains less than ASC-H (80.3%) and HSIL + SC (92.9%). As a result, the positive predictive value of glandular abnormalities is more prone to fluctuations than positive predictive values for other high-grade abnormalities. Due to the small number of samples involved, glandular abnormalities were not analysed in further detail by laboratory.

Comments

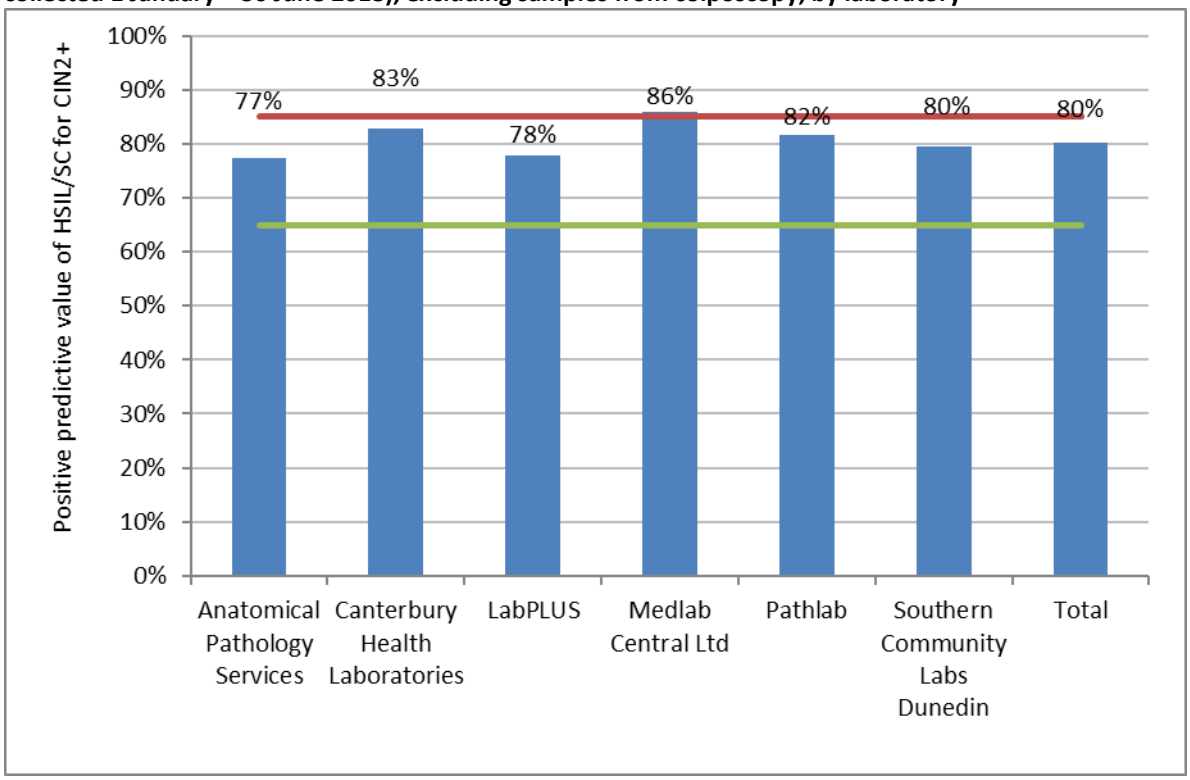
This estimate does not take into account cytology predicting HSIL for which there is no histology available. Histology may be unavailable because the woman does not attend for follow-up colposcopy, or a biopsy may not be taken if the colposcopic impression is normal. When the monitoring period for this indicator is after all DHBs have started reporting in accordance the 2013 Colposcopy Standards (September 2017), it should be possible to better distinguish between these two possibilities. This can also be examined by calculating the probability of a high-grade histological report (CIN 2/3 or higher) among all women attending colposcopy after a high-grade cytology report (rather than only among the subset of women where a biopsy is taken). These results are presented in Figure 91, and compared with those for women with low-grade cytology results with a positive HPV triage test.

Previous calculations did not discriminate between cytology taken as a screening or diagnostic test. Since diagnostic test samples are, by definition, collected from women at a higher risk of disease than the general population attending for screening, this may be a contributing factor for some laboratories with a PPV that is higher than the upper end of the target range,

particularly where the colposcopically-directed cytology and corresponding histology are reported by the same laboratory as best management practice. In the current report, the methodology was updated to try to restrict the analysis to screening or community-derived cytology samples, by excluding samples that appeared to have been collected at a colposcopy visit. This updated method should provide a clearer picture of positive predictive value of HSIL (and other reporting categories) in a screening setting. As samples collected at colposcopy are likely to have a higher PPV than screening samples (for the reasons above), this update led to a decrease in the PPV for HSIL + SC cytology samples in most laboratories, and the decrease was more pronounced for those laboratories with a higher proportion of samples originating from colposcopy clinics. After cytology collected at colposcopy was excluded, the number of laboratories that exceeded the upper target of 85% decreased from three to one.

The effect of the updated methodology on the estimates of the PPV for ASC-H were different than for HSIL + SC, because some women classified in the HSIL category in the original method, based on a sample collected at colposcopy, shifted into the ASC-H category, based on their referring cytology result (Table 57). Overwhelmingly, the women who shifted from the HSIL category to the ASC-H category were those with HSIL-confirmed histology. Potentially the result for the cytology sample collected at colposcopy (HSIL) differed from the referring cytology result (ASC-H) in these women because cytology could be colposcopically-directed and cytology and corresponding histology were reported by the same laboratory as best management practice.

Figure 45 - Positive predictive value for CIN 2+ in women with HSIL or SC cytology reports (cytology sample collected 1 January – 30 June 2018), excluding samples from colposcopy, by laboratory



Target: 65% - 85%.

Figure 46 – Comparison of positive predictive value for CIN 2+ in women with HSIL or SC cytology reports (cytology collected 1 January – 30 June 2018) between two calculation methods, by laboratory

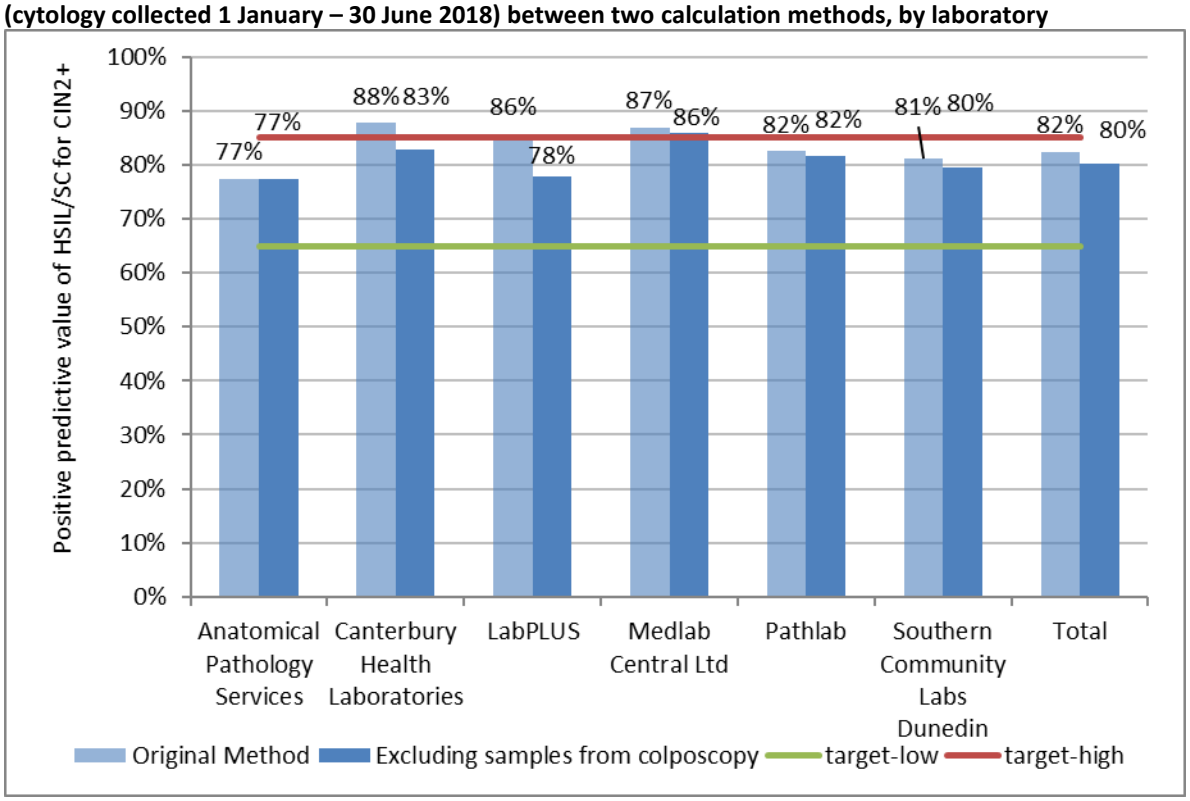


Figure 47 - Comparison of positive predictive value for CIN 2+ in women with ASC-H cytology reports (cytology collected 1 January – 30 June 2018) between two calculation methods, by laboratory

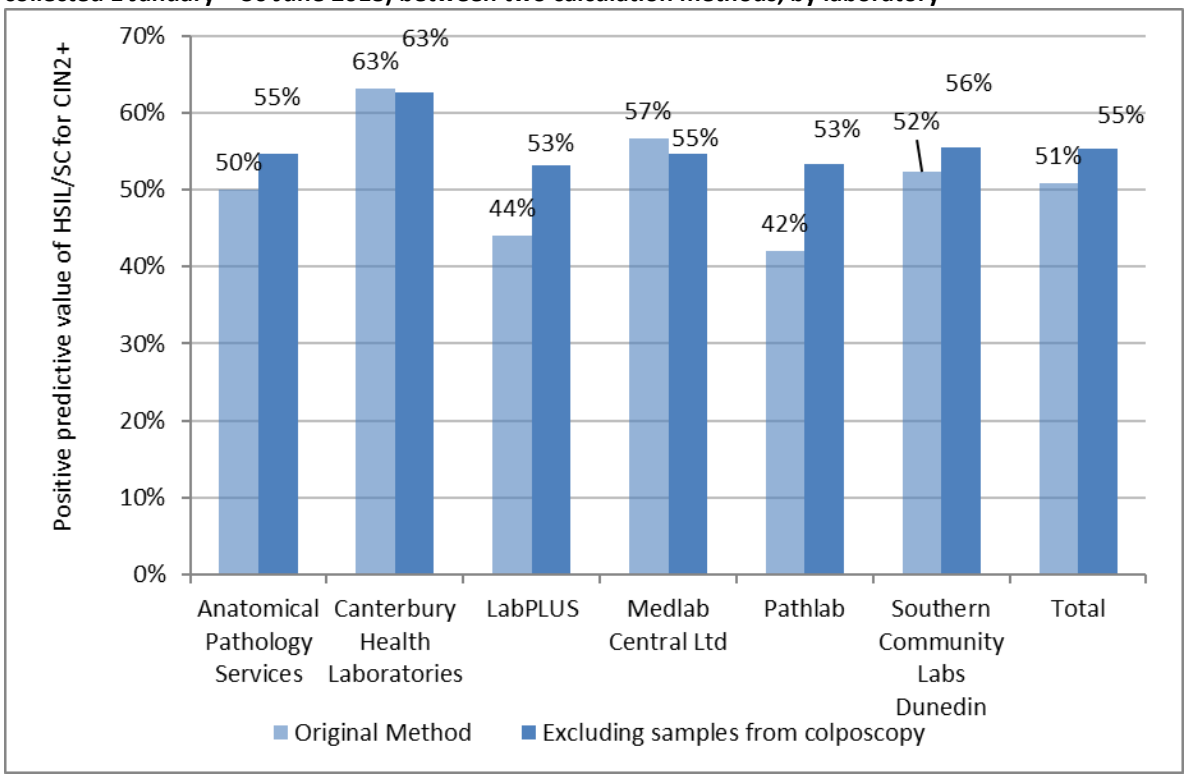


Figure 48 - Comparison of positive predictive value for CIN 2+ in women with ASC-H, HSIL or SC cytology reports (cytology collected 1 January – 30 June 2018) between two calculation methods, by laboratory

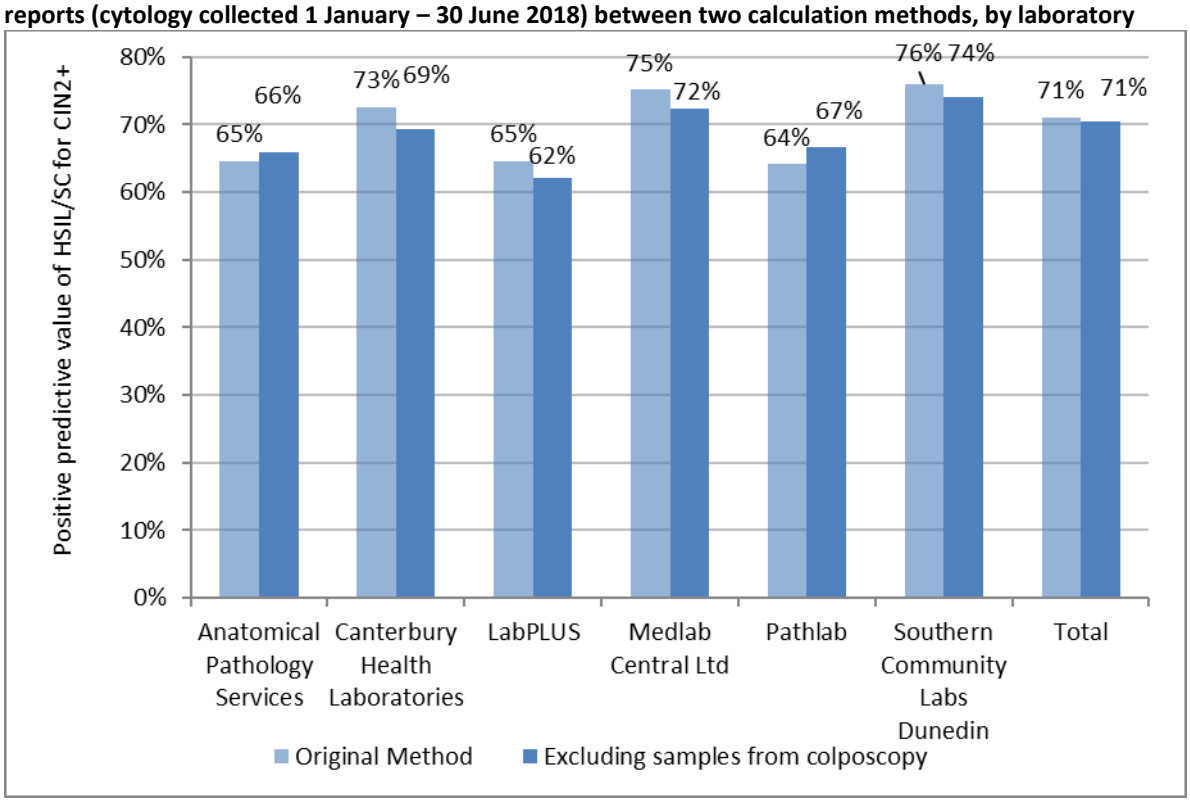
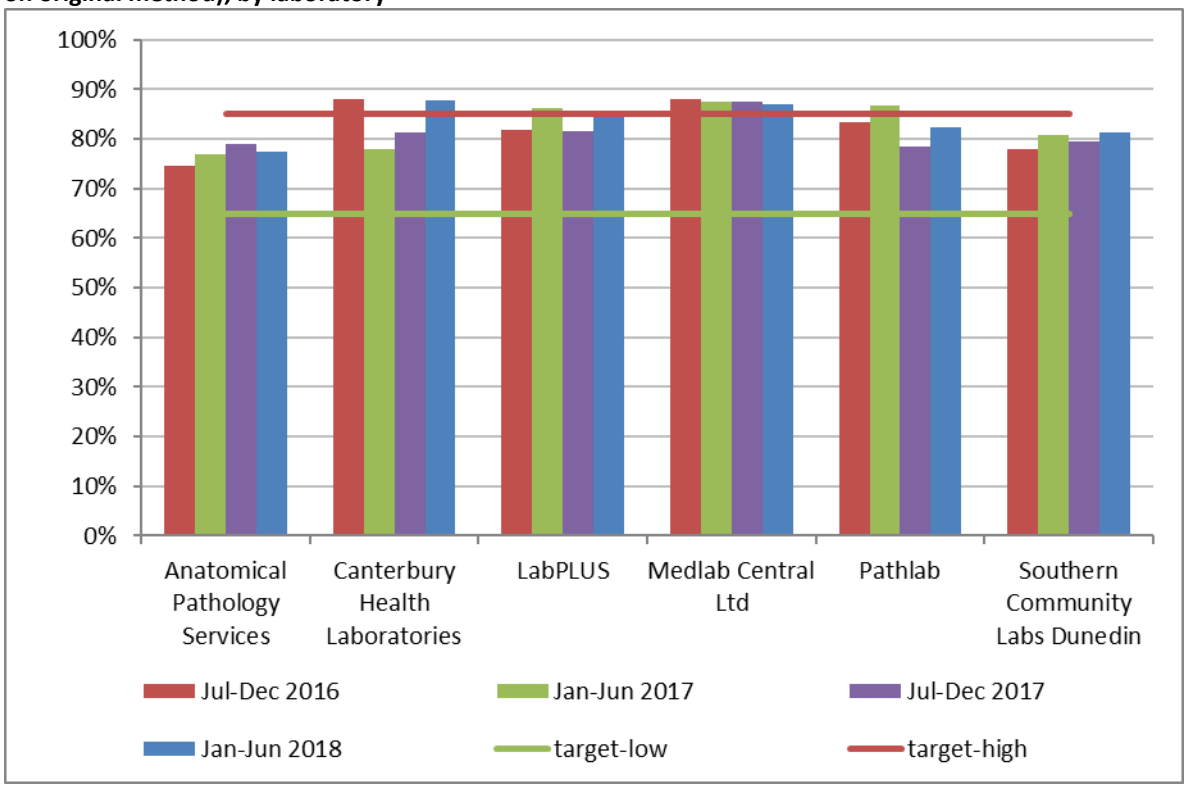
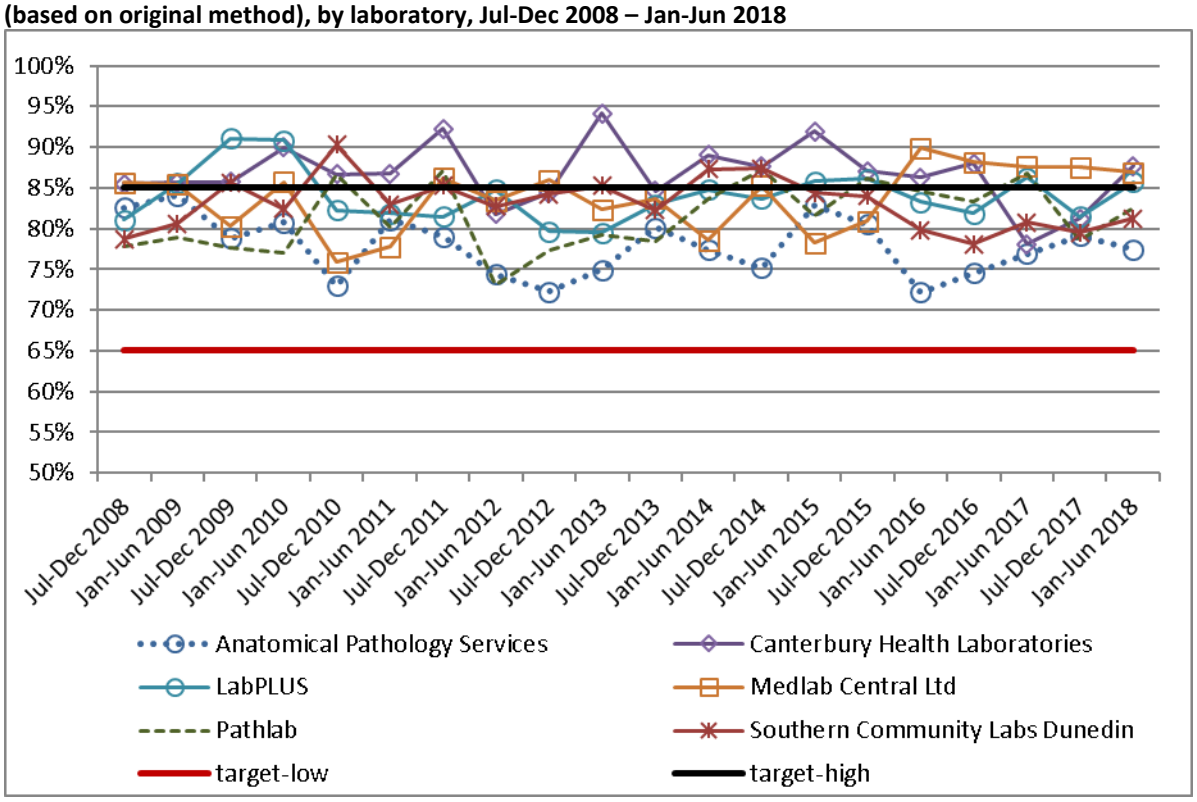


Figure 49 - Trends in the positive predictive value for CIN 2+ in women with HSIL or SC cytology results (based on original method), by laboratory



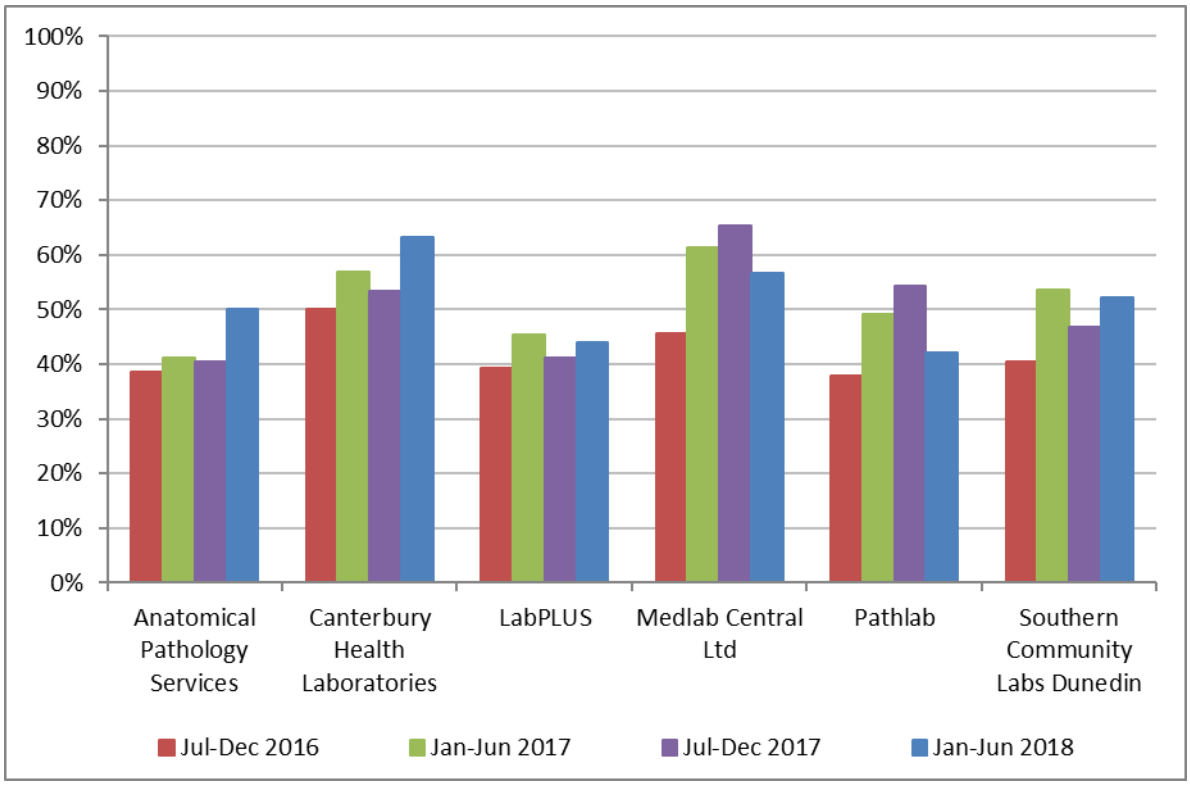
Time period relates to monitoring report period; cytology samples were collected in the period six months prior.

Figure 50 - Trends in the positive predictive value for CIN 2+ in women with HSIL or SC cytology results (based on original method), by laboratory, Jul-Dec 2008 – Jan-Jun 2018



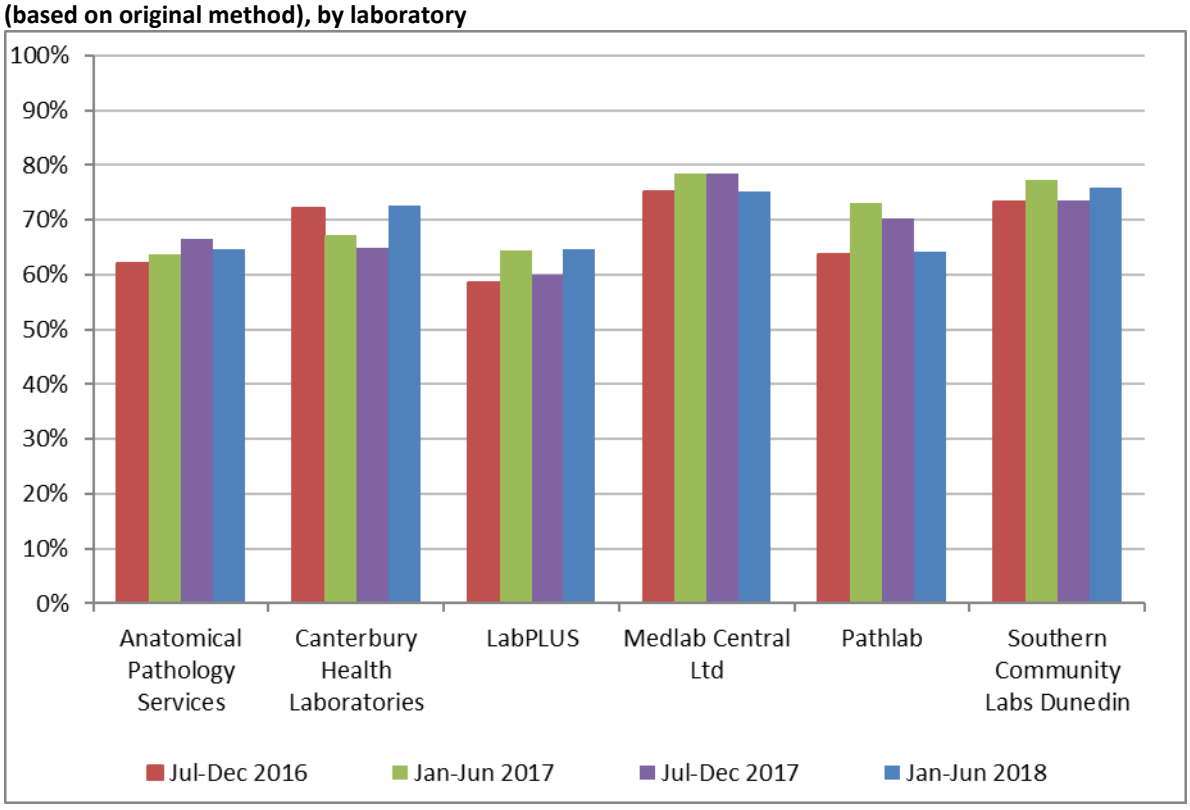
Time period relates to monitoring report period; cytology samples were collected in the period six months prior. Samples labelled as Anatomical Pathology Services prior to Report 43 (Jan-Jun 2015) were reported by Diagnostic Medlab Ltd.

Figure 51 - Trends in the positive predictive value for CIN 2+ in women with ASC-H cytology results (based on original method), by laboratory



Time period relates to monitoring report period; cytology samples were collected in the period six months prior.

Figure 52 - Trends in the positive predictive value for CIN 2+ in women with ASC-H, HSIL or SC cytology results (based on original method), by laboratory



Time period relates to monitoring report period; cytology samples were collected in the period six months prior.

Indicator 5.3 – Accuracy of negative cytology reports

Definition	This indicator currently has two parts to its definition. 1. For women with a histological diagnosis of CIN 2, CIN 3, invasive SCC, AIS or invasive endocervical adenocarcinoma, the proportion of cytology slides originally reported within the preceding 42 months as negative, benign/reactive or unsatisfactory which on review are consistent with high -grade or worse category (Standard 522). 2. The ability of a laboratory to correctly identify a negative sample. All cases with a high-grade or invasive diagnosis on histology (CIN 2, CIN 3, invasive SCC, AIS or invasive endocervical adenocarcinoma) must have a review of any cytology slides that have been reported as negative, benign/reactive or unsatisfactory in the previous 42 months. Any abnormality identified as high -grade or worse on review of a previously reported negative or unsatisfactory cytology slide must be documented by the laboratory. Cumulative data must be forwarded to the National Screening Unit to help ensure the accuracy of submitted negative cytology reports.
Target	No more than 10% of cytology originally identified as negative is identified as consistent with a cytological interpretation of HS1, HS2, SC, AIS or AC1-AC5 (HSIL+) on review. Aim for less than 15%, but not more than 20% of cytology originally identified as negative is identified as consistent with a cytological interpretation of ASC-H, HS1, HS2, SC, AG4-AG5, AIS or AC1-AC5 (ASC-H +) on review.
Current Situation	This indicator is analysed annually to allow for the full year to be examined. Data for women with a histological diagnosis of high-grade/ invasive disease in the period 1 January – 31 December 2017 2017 were provided in Report 48. Data for women with a histological diagnosis of high-grade/ invasive disease in the period 1 January – 31 December 2018 will be provided in Report 50.
Trends	-
Comments	-

Indicator 5.4 – Histology Reporting

Definition	The NCSP Register collects histology results of samples taken from the cervix and vagina. Histology samples include diagnostic biopsies, treatment biopsies, cervical polyps and the cervical tissue of total hysterectomy specimens. All histology samples taken during the current monitoring period were retrieved. Where a histology sample had more than one SNOMED code, or a woman had more than one histology result, the most serious (highest ranked) code was used (see Appendix C). Results are presented both according to the detailed SNOMED category, and by broader histology diagnostic category. The mapping between SNOMED codes and diagnostic category is detailed in Appendix C. Two versions of SNOMED are used by laboratories (1986 and 1993) depending on the laboratory software. The NCSP Register accepts both versions and for statistical purposes maps the 1986 codes to the 1993 codes. A woman's age is defined as her age at the end of the monitoring period (i.e. a woman's age at 30 June 2018). Where trends are shown, a woman's age is her age at the end of the 6-month period in which the result was reported.
Target	None
Current Situation	12,467 histology samples were taken during the current monitoring period. Of these, 431 (3.5%) were insufficient for diagnosis. These samples were taken from 427 women, 68 (15.9%) of whom have a record of a subsequent sufficient histology test. The remaining 12,036 samples were taken from 10,553 women. Results for these women are reported on in Table 7 to Table 10. Table 7 shows histology results by SNOMED category, based on the most serious (highest ranked) result for each woman in the monitoring period. Table 8 to Table 11 show histology results by broader histology diagnostic category. 56.1% of women with histology tests had negative or benign histology results (Table 8). 19.4% of women had high-grade squamous (CIN 2/3) histology results and 67 women (0.63%) had adenocarcinoma in situ. There were 51 women (0.48%) with invasive squamous cell carcinoma (ISCC) histology, 6 (0.06%) with microinvasive squamous cell carcinoma (SCC) histology and 43 (0.41%) with invasive adenocarcinoma; four (<0.05%) were adenocarcinomas arising from the endocervix and 39 (0.37%) were adenocarcinomas not arising from the endocervix. There were two women with adenosquamous carcinoma (<0.05%) as their most serious histology result. The age group with the largest number of women with histology samples was women aged 45-49 years (1,427 women, Table 9). Among women aged 20-69

years, the age group with the lowest rate of women with results which were negative was women aged 25-29 years (34.6%; Table 10).

Histology samples were additionally analysed after excluding 2,120 women whose only histology result(s) originated from a hysterectomy (partial with cervical component or total hysterectomy) and were negative/ benign (non-neoplastic) (Table 11). This represented approximately 35.8% of the women with negative/ benign histology. This reduced the proportion with a histology result being negative/ benign from 56.1% to 45.1% of all women with a histology sample. After excluding negative/ benign histology from hysterectomy samples, this resulted in 0.51% women with histology having an invasive adenocarcinoma result, including with adenocarcinomas arising from the endocervix (<0.05%) and women with adenocarcinomas not arising from the endocervix (0.46%). The most severe histological abnormality detected was HSIL (CIN 2/3) for 24.2% of women; ISCC for 0.60% of women; microinvasive SCC for 0.07% of women; adenocarcinoma in situ for 0.79% of women; and adenosquamous carcinoma for <0.05% of women (Table 11).

The number of women with CIN 2/3 histology within the monitoring period was further explored as a rate per 1,000 women screened within the period (where a screening event included a cytology, histology or HPV event). There were 2,044 women with CIN 2/3 histology, corresponding to a rate of 10.0 women with CIN 2/3 histology per 1,000 women screened (age-standardised to WHO population aged 20-69 years). Among women aged 20-69, the rate of women with CIN 2/3 histology samples taken per 1,000 women screened was highest in women aged 25-29 (18.7 per 1,000 women screened) and lowest in women aged 60-64 years (2.4 per 1,000 women screened) (Figure 53). By ethnicity, Māori women had the highest rates of CIN2/3 histology per 1,000 women screened (12.0 women) and Asian women the lowest (6.1 women) (age-standardised to WHO population aged 20-69 years; Table 58, Figure 54). This difference was most apparent in younger women aged less than 35 years (Figure 53, Table 58).

Trends

The proportion of women with negative or benign histology (56.1%; or 45.1% if benign hysterectomy samples are excluded; Table 8, Table 11) is similar to that reported for the previous period (56.8%; 45.6% if benign hysterectomy samples are excluded).

The proportions were similar to those in the previous period for women with invasive adenocarcinoma not arising from the endocervix (0.37% in the current and previous period) and adenocarcinoma arising from the endocervix (<0.05% in both periods). An increase was seen in women with adenocarcinoma in situ (0.63% in this period and 0.57% last period) and for CIN1 (15.6% to 16.8% in the current period). The proportion slightly decreased for women with ISCC (0.48% in this period and 0.52% in the last period).

Rates of CIN 2/3 per 1,000 women screened were previously reported in Annual Reports (up to 2013), but have been re-analysed in six-month monitoring periods for the purpose of this report. These are shown by ethnicity in Figure 54, and by age in Figure 55. When looking at longer term

changes, notable decreasing trends over time are seen in women aged 20-24 and 25-29, from the latter half of 2012 and early 2016, respectively (Figure 55).

Longer term trends by ethnicity are shown in Table 59, and for selected age groups (20-24 and 25-29) in Figure 56, based on those ages which would include a proportion of women who have been vaccinated against HPV. In both Māori and European/ Other women, there has been a consistent decline in CIN 2/3 cases per 1,000 women screened, since approximately 2012 for woman aged 20-24 years. More recently, rates also appear to have begun declining in European/ Other women aged 25-29 years, and potentially also in Māori women. Trends are less consistent in Pacific and Asian women.

Comments

Histology samples include diagnostic biopsies, treatment biopsies, cervical polyps and the cervical tissue of total hysterectomy specimens. Histology samples may also include samples from non-cervical sites, where there is also a cervical component in the sample, for example endometrial samples. Also, pathologists are not always able to determine the site of origin particularly in small biopsies. "Adenocarcinoma not endocervical type" is the code that pathologists use for adenocarcinomas involving the cervix, but not primarily arising from the cervix. This means that the code category of endocervical adenocarcinoma of endocervical type should equate much more closely with data held on the Cancer Registry. In addition, it has been identified that the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive adenocarcinoma not endocervical type" may be over reported and "invasive adenocarcinoma endocervical type" under-reported in these laboratories. This is in the process of being corrected.

In the current report, a supplementary analysis was undertaken which excluded any samples which originated from a hysterectomy sample (partial with cervical component or total) which were negative/ benign. These supplementary results may more closely reflect the results of histology which were collected in relation to the NCSP.

In previous reports, trends in high grade abnormalities were examined by looking at the rate of women with CIN 2/3 histology, as a proportion of all women with histology. In the current report, this aspect of looking at trends in high-grade histological abnormalities has been updated to look at the rate of CIN 2/3 histology per 1,000 women screened. This is a more widely used and standard measure, and has been brought across from the NCSP Annual Reports. The previous measure has been included in this report in Figure 113, to allow comparison with earlier reports.

As discussed in Indicator 5.1, a decline in both cytological and histological HSIL would be expected to occur as a consequence of the introduction of HPV vaccination from September 2008, and this would be expected to occur in younger age groups first (the oldest birth cohorts eligible for vaccination through the publicly funded programme would be aged up to 28 years at the time of the current monitoring period, while the oldest birth cohorts offered

vaccination at the target age of 12-13 years would be aged up to 22 years). Declines histological HSIL in younger women in this section of the current monitoring report are consistent with declines also seen in the proportion of satisfactory samples reported as HSIL, documented as part of Indicator 5.1. These results in New Zealand are consistent with findings from a number of other countries that have reported a reduction in population-level rates of histological HSIL since the introduction of HPV vaccination.[14] They also contribute to a relatively smaller number of settings that have reported vaccine impact within specific ethnicity subgroups of the population.[15, 16]

Table 7 - Histology results reporting by SNOMED category

SNOMED category	Women with that diagnosis N	%
Negative/normal	3,230	30.6
Inflammation	649	6.1
Microglandular hyperplasia	7	0.07
Squamous metaplasia	290	2.7
Polyp	1,414	13.4
Other*	329	3.1
Atypia	42	0.40
Benign glandular atypia	3	<0.05
HPV	584	5.5
Condyloma acuminatum	3	<0.05
CIN 1 (LSIL) or VAIN 1	1,688	16.0
Dysplasia/CIN NOS	41	0.39
Glandular dysplasia	1	<0.05
CIN 2 (HSIL) or VAIN 2	788	7.5
HSIL not otherwise specified	41	0.39
CIN 3 (HSIL) or VAIN 3	1,215	11.5
Adenocarcinoma in situ	67	0.63
Microinvasive squamous cell carcinoma	6	0.06
Invasive squamous cell carcinoma	51	0.48
Adenocarcinoma (arising from the endocervix)	4	<0.05
Invasive adenocarcinoma (not arising from the endocervix)	39	0.37
Adenosquamous carcinoma	2	<0.05
Undifferentiated carcinoma	3	<0.05
Sarcoma	1	<0.05
Carcinosarcoma	2	<0.05
Choriocarcinoma	-	-
Miscellaneous primary tumour	5	<0.05
Metastatic tumour	26	0.25
Small cell carcinoma	2	<0.05
Malignant tumour, small cell type	-	-
Melanoma	-	-
Other primary epithelial malignancy	20	0.19
Total	**10,553**	**100**

NOS = not otherwise specified; HSIL not otherwise specified = high -grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (SNOMED code M67017; see Appendix C)

** Other morphologic abnormality, not dysplastic or malignant.*

Note: the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive adenocarcinoma not endocervical type" may be over reported and "invasive adenocarcinoma endocervical type" under-reported in these laboratories.

Table 8 - Histology results reporting by diagnostic category

Histology category	Women with that histology result	
	N	%
Negative/benign (non neoplastic)	5,922	56.1
HPV	587	5.6
CIN1	1,771	16.8
Glandular dysplasia	1	<0.05
CIN 2	788	7.5
HSIL not otherwise specified	41	0.39
CIN 3	1,215	11.5
Adenocarcinoma in situ	67	0.63
Microinvasive	6	0.06
Invasive squamous cell carcinoma	51	0.48
Adenocarcinoma (arising from the endocervix)	4	<0.05
Invasive adenocarcinoma (not arising from the endocervix)	39	0.37
Adenosquamous carcinoma	2	<0.05
Other cancer	59	0.56
Total	**10,553**	**100.0**

Details of mapping between SNOMED category and diagnostic category are included in Appendix C. HSIL not otherwise specified = high-grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (SNOMED code M67017; see Appendix C). Note: the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive adenocarcinoma not endocervical type" may be over reported and "invasive adenocarcinoma endocervical type" under-reported in these laboratories.

Table 9 - Histology results by age – counts

	Age group												
Histology Diagnostic Category	**<20**	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65-69**	**70+**	**Total**
Negative/benign (non neoplastic)	14	321	355	429	555	853	1,076	830	544	366	269	310	5,922
HPV	-	93	82	73	68	64	62	58	37	25	17	8	587
CIN1	3	396	328	296	223	148	137	91	74	37	24	14	1,771
Glandular dysplasia	-	-	-	-	-	-	1	-	-	-	-	-	1
CIN 2	3	186	176	158	83	53	52	26	24	11	12	4	788
HSIL not otherwise specified	-	7	16	6	2	2	3	2	1	1	-	1	41
CIN 3	-	134	285	292	173	113	76	42	40	26	19	15	1,215
Adenocarcinoma in situ	-	1	13	21	6	10	4	2	5	3	2	-	67
Microinvasive	-	-	-	2	1	1	1	-	1	-	-	-	6
Invasive squamous cell carcinoma	-	-	7	7	6	5	7	4	3	5	4	3	51
Adenocarcinoma (arising from the endocervix)	-	-	-	-	-	2	1	1	-	-	-	-	4
Invasive adenocarcinoma (not arising from the endocervix)	-	-	1	2	3	3	3	4	10	1	5	7	39
Adenosquamous carcinoma	-	-	-	-	1	-	1	-	-	-	-	-	2
Other cancer	-	-	1	4	2	1	3	8	5	6	10	19	59
Total	**20**	**1,138**	**1,264**	**1,290**	**1,123**	**1,255**	**1,427**	**1,068**	**744**	**481**	**362**	**381**	**10,553**

HSIL not otherwise specified = high -grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (SNOMED code M67017; see Appendix C)
Note: the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive adenocarcinoma not endocervical type" may be over reported and "invasive adenocarcinoma endocervical type" under-reported in these laboratories.

Table 10 - Histology results by age – percentages

Histology Diagnostic Category	Age group											
	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+
Negative/benign (non neoplastic)	70.0	28.2	28.1	33.3	49.4	68.0	75.4	77.7	73.1	76.1	74.3	81.4
HPV	-	8.2	6.5	5.7	6.1	5.1	4.3	5.4	5.0	5.2	4.7	2.1
CIN1	15.0	34.8	25.9	22.9	19.9	11.8	9.6	8.5	9.9	7.7	6.6	3.7
Glandular dysplasia	-	-	-	-	-	-	0.07	-	-	-	-	-
CIN 2	15.0	16.3	13.9	12.2	7.4	4.2	3.6	2.4	3.2	2.3	3.3	1.0
HSIL not otherwise specified	-	0.62	1.27	0.47	0.18	0.16	0.21	0.19	0.13	0.21	-	0.3
CIN 3	-	11.8	22.5	22.6	15.4	9.0	5.3	3.9	5.4	5.4	5.2	3.9
Adenocarcinoma in situ	-	0.09	1.0	1.6	0.53	0.80	0.28	0.19	0.67	0.62	0.55	-
Microinvasive	-	-	-	0.16	0.09	0.08	0.07	-	0.13	-	-	-
Invasive squamous cell carcinoma	-	-	0.55	0.54	0.53	0.40	0.49	0.37	0.40	1.04	1.1	0.8
Adenocarcinoma (arising from the endocervix)	-	-	-	-	-	0.16	0.07	0.09	-	-	-	-
Invasive adenocarcinoma (not arising from the endocervix)	-	-	0.08	0.16	0.27	0.24	0.21	0.37	1.34	0.21	1.38	1.84
Adenosquamous carcinoma	-	-	-	-	0.09	-	0.07	-	-	-	-	-
Other cancer	-	-	0.08	0.31	0.18	0.08	0.21	0.75	0.67	1.25	2.8	5.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

HSIL not otherwise specified = high -grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (SNOMED code M67017; see Appendix C).
Note: the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive adenocarcinoma not endocervical type" may be over reported and "invasive adenocarcinoma endocervical type" under-reported in these laboratories.

Table 11 - Histology results reporting by diagnostic category excluding samples from partial* or total hysterectomy specimens and where the result was negative/ benign.

Histology category	Women with that histology result	
	N	%
Negative/benign (non neoplastic)	3,802	45.1
HPV	587	7.0
CIN1	1,771	21.0
Glandular dysplasia	1	<0.05
CIN 2	788	9.3
HSIL not otherwise specified	41	0.49
CIN 3	1,215	14.4
Adenocarcinoma in situ	67	0.79
Microinvasive	6	0.07
Invasive squamous cell carcinoma	51	0.60
Invasive adenocarcinoma (arising from the endocervix)†	4	<0.05
Invasive adenocarcinoma (not arising from the endocervix)†	39	0.46
Adenosquamous carcinoma	2	<0.05
Other cancer	59	0.70
Total	8,433	**100.0**

**Partial with cervical component. Details of mapping between SNOMED category and diagnostic category are included in Appendix C.*

HSIL not otherwise specified = high-grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (SNOMED code M67017; see Appendix C). Results differ from those in Table 8 due to the exclusion of negative/ benign results from partial/ total hysterectomy samples.

† Note: the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive adenocarcinoma not endocervical type" may be over reported and "invasive adenocarcinoma endocervical type" under-reported in these laboratories.

Figure 53 - Rate of women with CIN 2/3 per 1,000 women screened, by age and ethnicity for the period 1 January – 30 June 2018

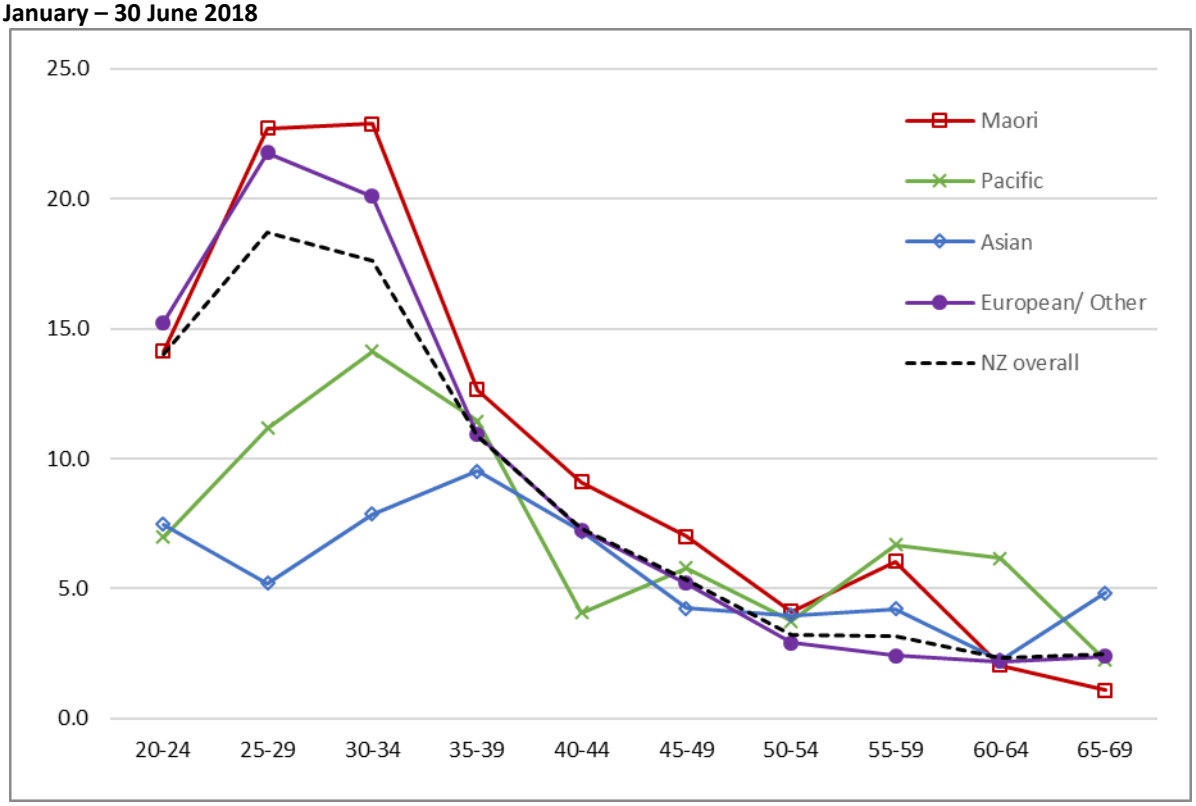
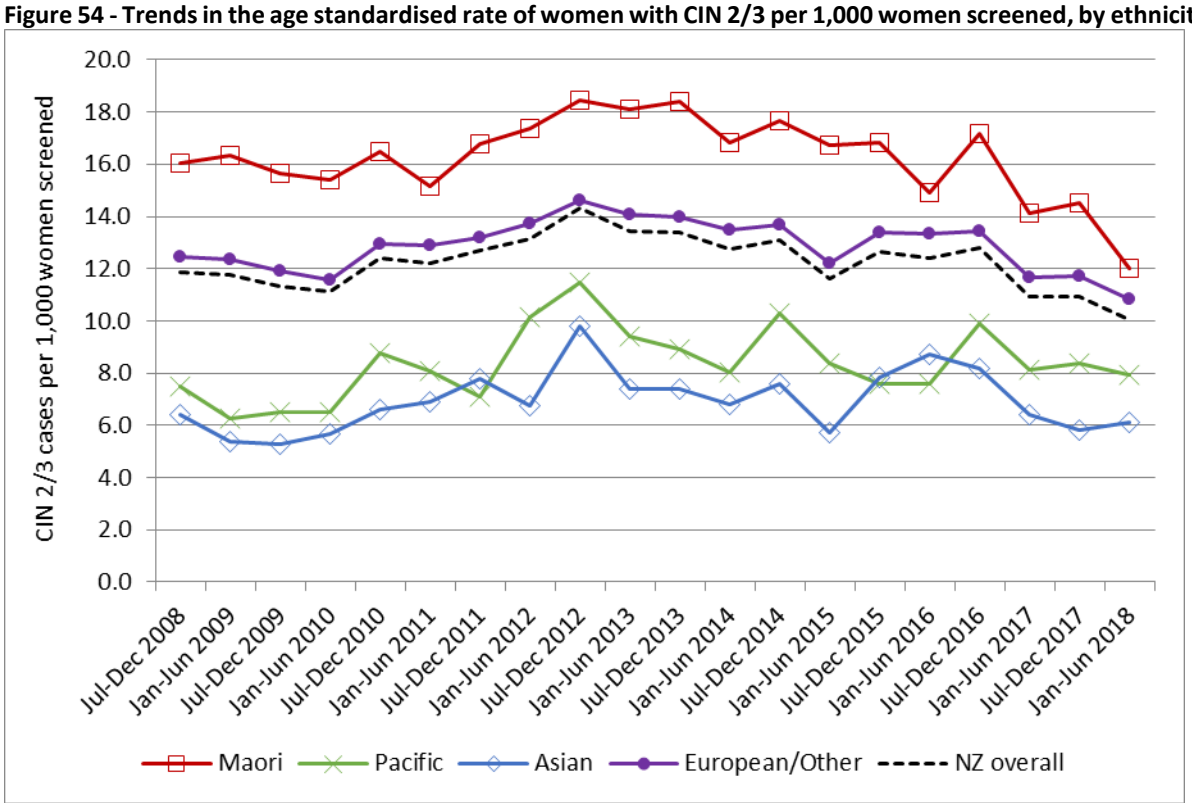


Figure 54 - Trends in the age standardised rate of women with CIN 2/3 per 1,000 women screened, by ethnicity



Age-standardised rate, standardised to the WHO population (ages 20-69 years)

Figure 55 - Trends in the rate of women with CIN 2/3 per 1,000 women screened, by age

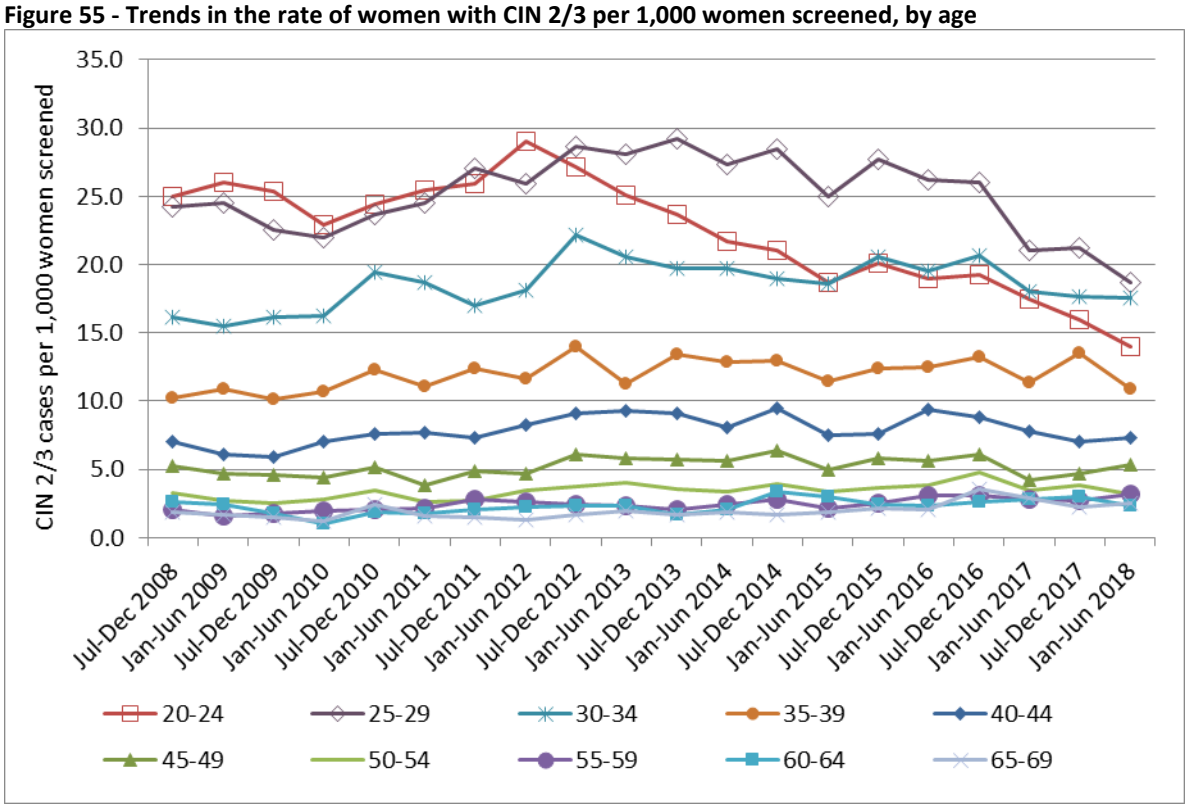
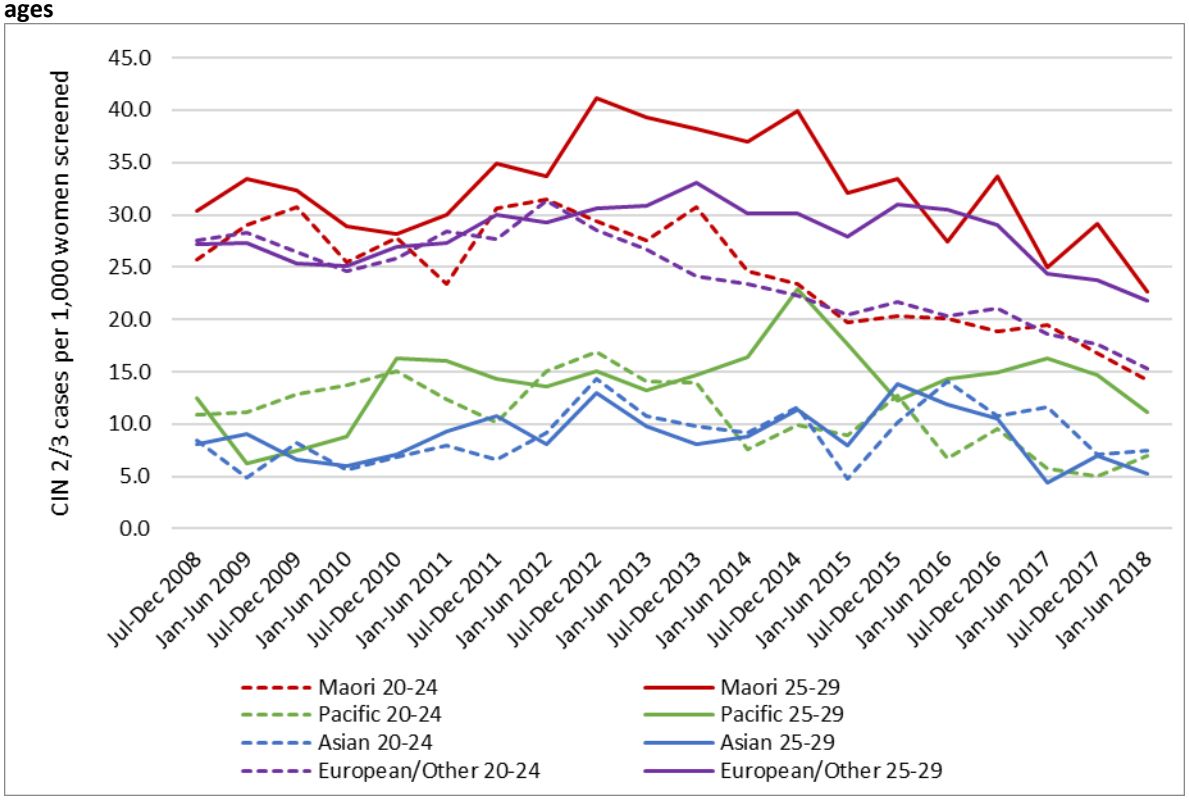


Figure 56 - Trends in the rate of women with CIN 2/3 per 1,000 women screened, by ethnicity and selected ages



Indicator 5.5 - Laboratory turnaround times

Definition	Turnaround time is defined as the number of working days from the date a sample is received by a laboratory, and the date which it is reported to the sample taker (for cytology and hrHPV samples) or referring colposcopist (for histology samples). For the purposes of this measure, samples received and reported on the same day are defined as having a turnaround time of one day.
Target	***Cytology*** Laboratories are required to report 90% of final gynaecological cytology results to sample takers within seven working days of receipt of the sample and 98% within 15 working days (Standard 513[17]). ***Histology*** Laboratories are required to report 90% of final histology results to referring colposcopists within ten working days of receipt of the sample and 98% of final histology results within 15 working days of receiving the sample (Standard 516[17]). ***Cytology with associated hrHPV testing*** Laboratories are required to report 98% of final cytology test results (including those associated with HPV test) within 15 working days of receiving the sample. Here, the turnaround time is measured specifically for cytology where HPV testing is performed for low-grade triage. Low-grade triage is defined further in Indicator 8; here it relates to cytology samples *received at the laboratory* in the monitoring period (as opposed to *samples collected* in the period, in Indicator 8). It is restricted to triage testing of women aged 30 years or more. These samples form a subset of those considered in the overall measure of turnaround time for cytology. Note that since reporting of cytology with adjunctive hrHPV testing requires that both test results be reported together (hrHPV test results must not be issued independently when adjunct to a cytology request), the turnaround time of the hrHPV test should not exceed that of the accompanying cytology, except where the HPV test was added after cytology was already reported.
Current Situation	***Cytology*** Six laboratories received 218,755 cytology samples during the current monitoring period. Overall, 94.9% of cytology samples were reported on within seven working days, which meets the target of 90% (Table 61). Nationally, 99.0% were reported on within 15 working days, which meets the target of 98%. Four of the six laboratories met the target for 90% of cytology samples to be reported to sample takers in seven working days or less (Anatomical Pathology Services, Canterbury Health Laboratories, Pathlab and Southern Community Labs Dunedin) while the remaining two laboratories (LabPLUS, Medlab Central Ltd.) reported on 70.9% and 89.3% of cytology samples within seven days

(Figure 57, Table 61). All six laboratories also met the target of 98% of samples reported within 15 working days (Anatomical Pathology Services, Canterbury Health Laboratories, LabPLUS, Medlab Central Ltd, Pathlab and Southern Community Labs Dunedin) (Figure 58, Table 61).

Histology

Fourteen laboratories received 12,446 histology samples in the current monitoring period. Overall 92.3% of samples were reported on within ten working days, which meets the target of 90%. Nationally 96.9% were reported on in 15 working days or less, which is below the target of 98% (Table 62). Eight of the 14 laboratories met the target of 90% of final histology results to referring colposcopists within ten working days of receipt of the sample (Anatomical Pathology Services, Medlab Central Ltd, Middlemore Hospital Laboratory, Nelson Hospital Laboratory, North Shore Hospital Laboratory, Southern Community Laboratories Dunedin, Southern Community Laboratories Wellington, Taranaki) (Figure 59). Five laboratories met the target of 98% of final histology results reported to the requestor within 15 working days of receiving the sample (Figure 60, Table 62). Among the eight remaining laboratories, six had reported on at least 95% of samples within 15 days (Figure 60, Table 62). The proportion of histology samples reported on within 15 days ranged from 79.4% (Waikato Hospital Laboratory) to all samples in Taranaki Medlab.

Low-grade cytology with associated HPV triage testing

Six laboratories received 3,063 cytology samples during the current monitoring period which were associated with HPV testing for the purpose of triage of low-grade abnormalities. Overall, 99.3% of these cytology samples were reported on within 15 working days, which meets the target of 98%. The proportion of cytology samples with HPV triage tests reported on within 15 days ranged from 97.6% (LabPLUS) to 99.9% (Anatomical Pathology Services) (Figure 61, Table 63).

The target of 98% of tests reported within 15 working days was met by four of the six laboratories. Nationally, the proportion of cytology reported within 15 days for cytology associated with low-grade triage HPV testing (99.3%) was similar to the cytology reported overall (99.0%). At most laboratories, the proportion of cytology tests reported within 15 working days was similar regardless of whether there is an associated HPV triage test (Figure 61). LabPlus and Medlab Central Ltd. reported below the target level for cytology associated with low-grade triage HPV testing (97.6% and 97.7%, respectively) but achieved the target for cytology overall (98.2% and 98.5%, respectively).

Trends

Cytology

The overall proportion of samples reported on within seven working days in the current report (94.9%) is lower than the proportion reported in the previous monitoring period (96.3%). Four laboratories met the target in this monitoring period which is one less laboratory compared to the previous reporting period. The proportion of samples reported on within 15 working days was similar in the previous monitoring period (99.0% compared to 99.2%

in the previous monitoring period). All six laboratories met the target of reporting 98% of samples within 15 working days, which is one more than the previous report.

Histology

The proportion of histology samples reported on within ten working days has decreased in this report (from 94.0% to 92.3%). Eight laboratories achieved the ten-working-days target in this monitoring period compared to nine in the last period. The proportion of histology samples reported on within 15 working days is similar to the previous report (96.9%, compared to 97.2% in the previous report). Five laboratories meet the target in this period compared to six in the previous report. In the current period, eleven of the 14 laboratories had reported on at least 95% of samples within 15 days, which is one more than achieved in the previous period.

Cytology with associated HPV triage testing

The proportion of cytology samples with an associated HPV triage test reported within 15 working days is similar to the previous report – from 99.0% to 99.3%. The target of reporting 98% of final cytology test results within 15 working days was met by one less laboratory compared to the previous report.

Comments

Note that the total number of cytology samples reported on in this Indicator is different from that reported in Indicator 5.1, as the inclusion criteria for the current indicator was all cytology samples *received by laboratories* within the monitoring period, rather than cytology samples where the *specimen was collected* during the monitoring period, which is the criteria for Indicator 5.1.

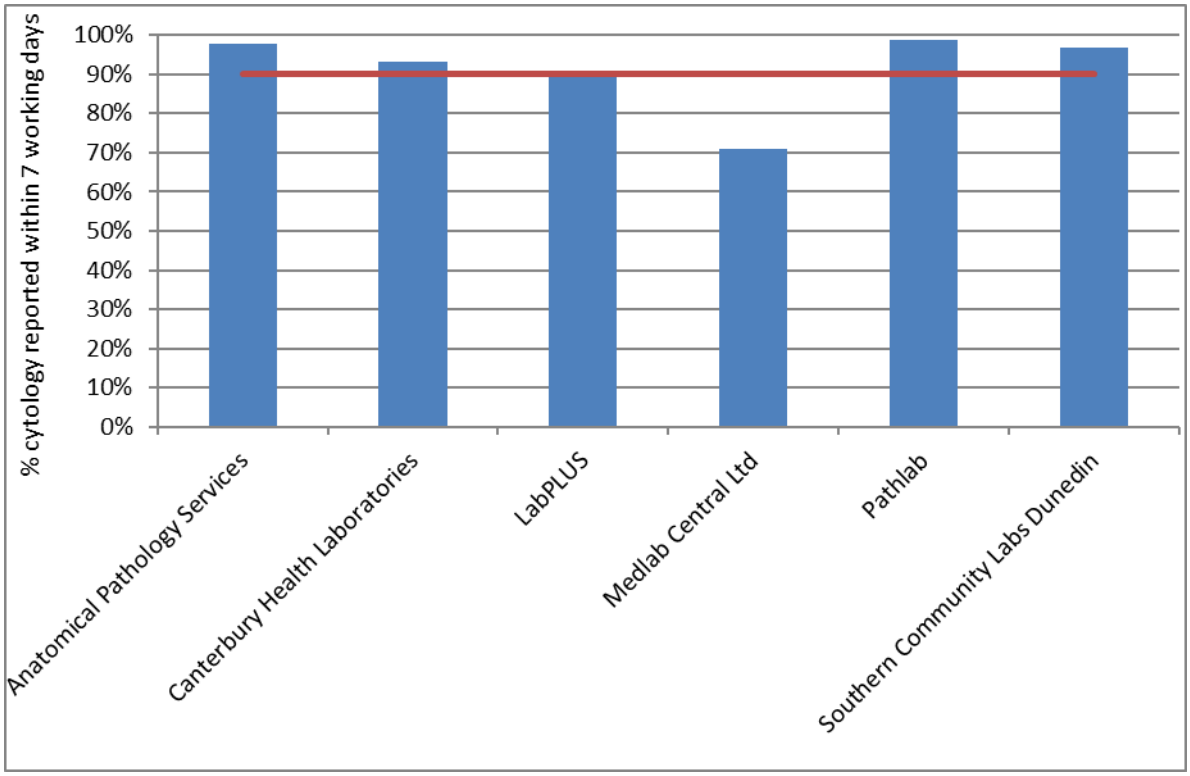
The definition used by individual laboratories for turnaround time differs. For example, depending on the definition used by the laboratory, a turnaround time of one day can mean the results are reported within 24 hours, on the same day the sample is received, or on the day after the sample is received. Therefore, we have applied the same definition to all laboratories in these calculations, but because of the variation between laboratories in their internal definition, it has not been possible in this report to use a definition here which is consistent with what each individual laboratory uses.

Turnaround time performance may be underestimated due to limitations in the report date recorded on the NCSP Register. When amended reports are sent to the NCSP Register, the report date in the NCSP Register is updated to reflect the date on which the report was re-transmitted after the amendments are made. The occurrence of these amended reports can therefore distort (and lengthen) turnaround time, as in these cases the report date recorded in the NCSP Register does not reflect the date on which results were first communicated to the sample taker or colposcopist. The extent of this cannot be directly determined from the NCSP Register, however audit results (which invariably find better turnaround time performance) suggest that it is a factor which should be considered in interpretation of these results.

There are some possible explanations why in some laboratories the turnaround time for cytology with associated HPV triage testing is longer than for other cytology. As the HPV triage test is performed in response to low-grade cytology results in a subset of women (those aged 30 years or more without a recent cytological abnormality), the need for the HPV test is only apparent after the cytology result is available. Additionally, as HPV tests are generally performed in batches, laboratories with smaller HPV test volumes may take longer to accrue the required batch sizes, and therefore perform HPV tests less frequently.

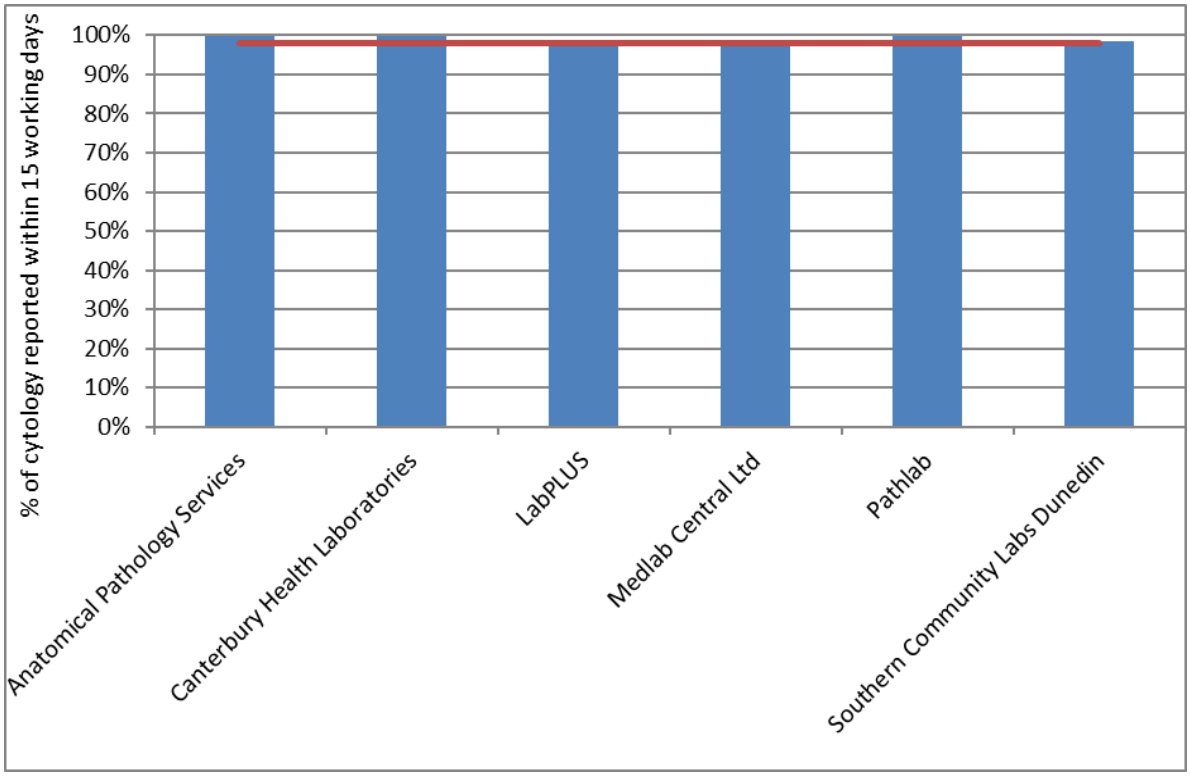
Caution must be taken when comparing percentages of reporting from this monitoring period to previous monitoring periods due to changes in the number of reporting laboratories. Differences in percentages from this and previous monitoring reports may be due to differences in caseloads.

Figure 57 - Proportion of cytology samples reported within seven working days by laboratory, 1 January – 30 June 2018



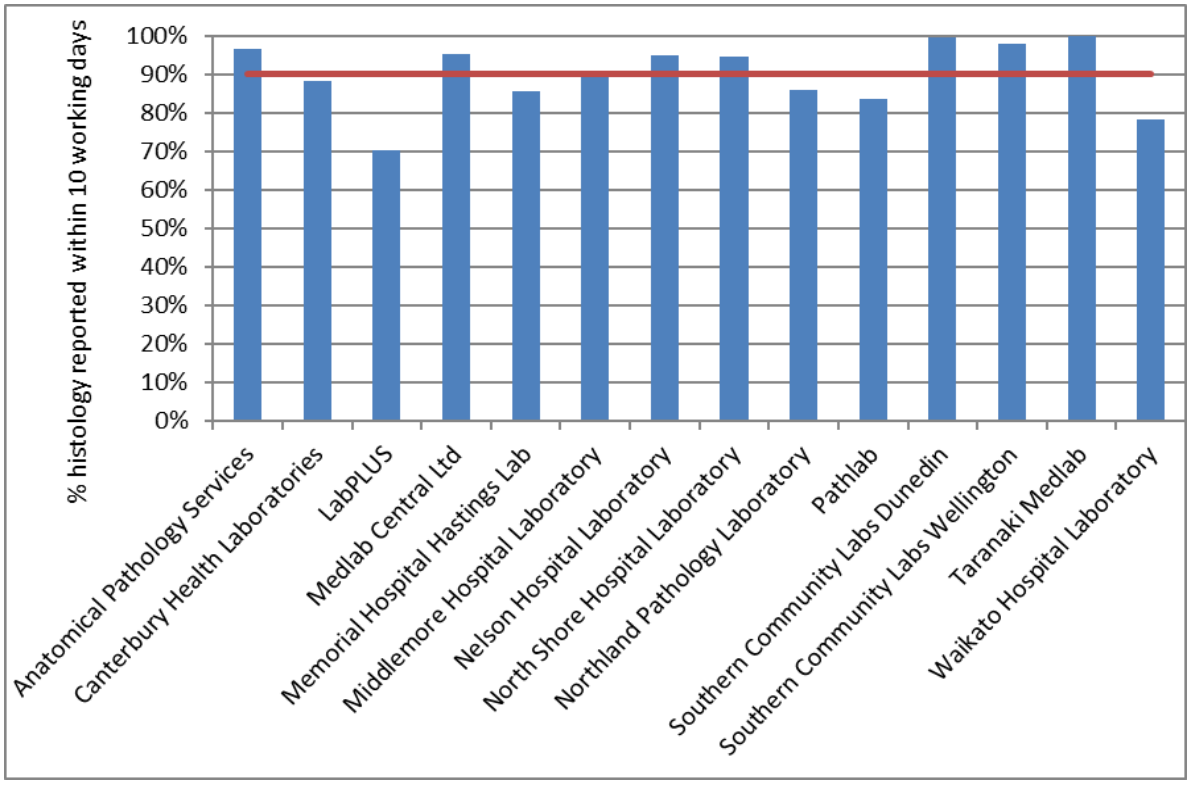
Target: 90% within seven working days (red line)

Figure 58 - Proportion of cytology samples reported within 15 working days by laboratory, 1 January – 30 June 2018



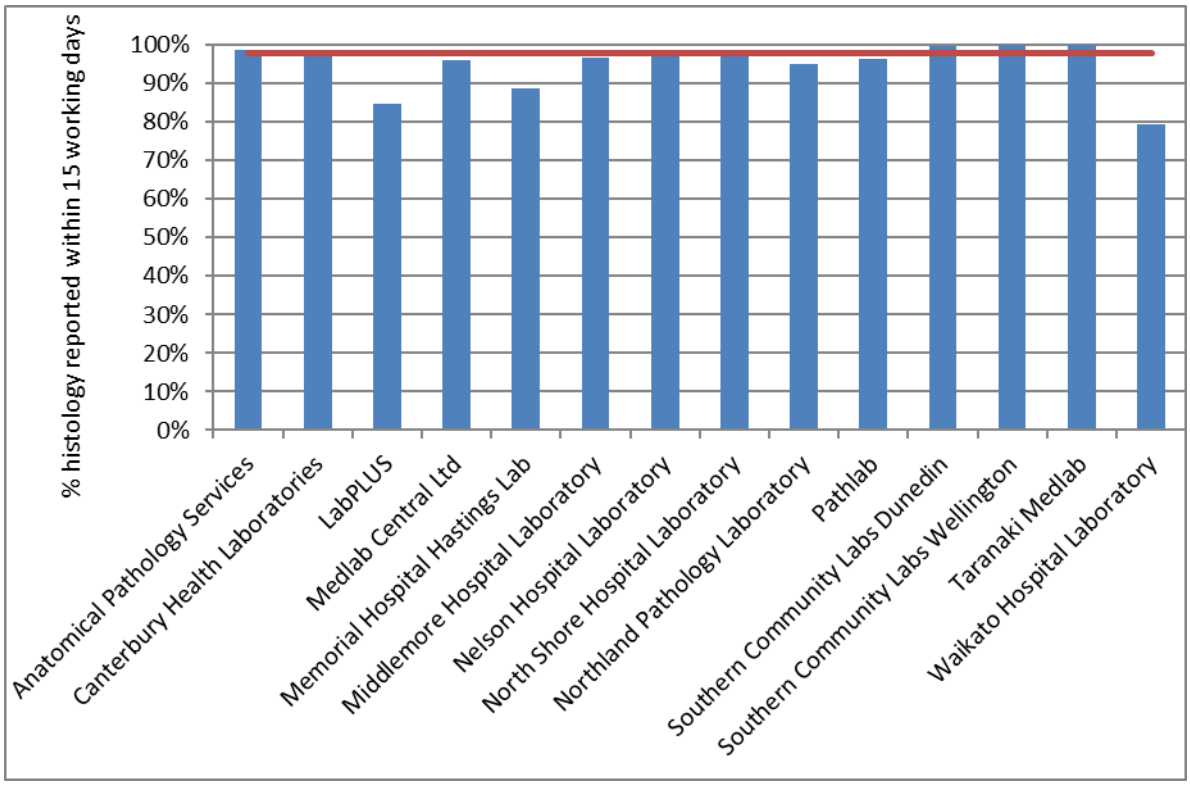
Target: 98% within 15 working days (red line)

Figure 59 - Proportion of histology samples reported within ten working days by laboratory, 1 January – 30 June 2018



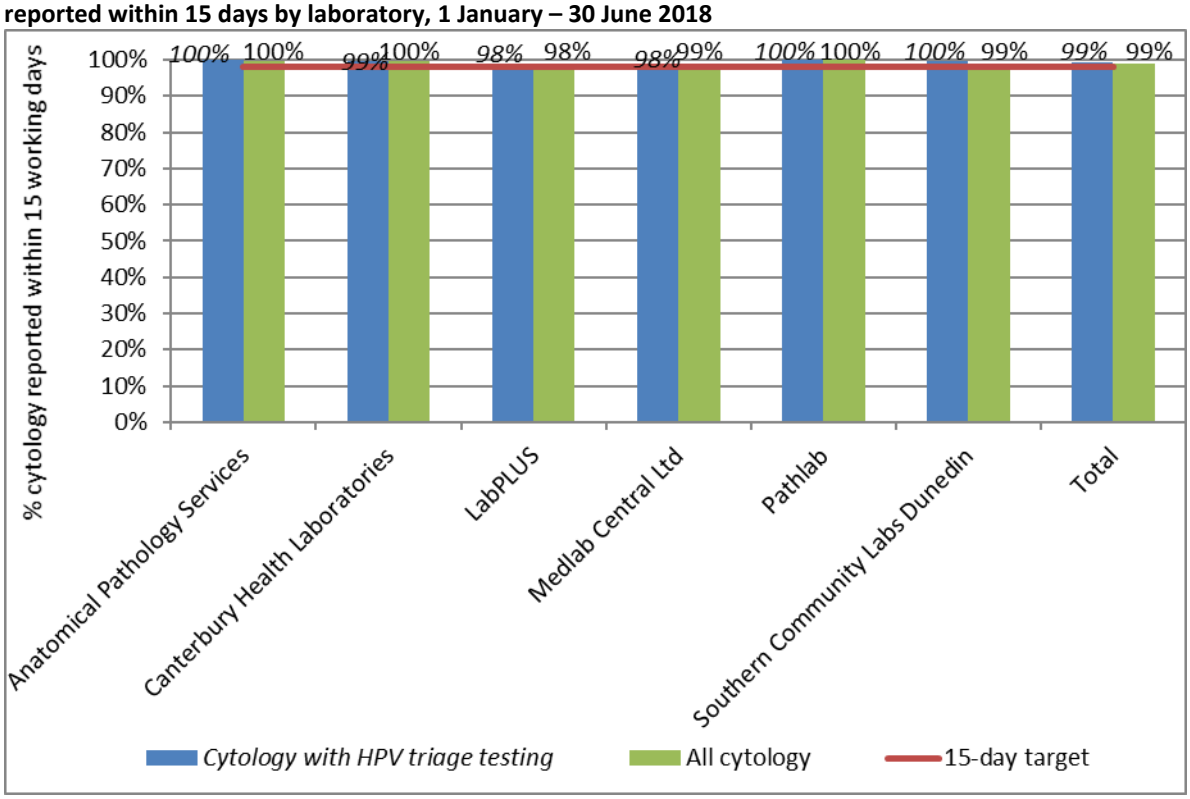
Target: 90% within ten working days (red line)

Figure 60 - Proportion of histology samples reported within 15 working days by laboratory, 1 January – 30 June 2018



Target: 98% within 15 working days (red line)

Figure 61 - Proportion of cytology samples with associated HPV triage testing and of all cytology samples reported within 15 days by laboratory, 1 January – 30 June 2018



Target: 98% within 15 working days (red line)

Indicator 6 – Follow-up women high-grade cytology, no histology

Definition

The proportion of women who have had a cervical sample showing a high-grade cytology result for whom a histological report has been received by the NCSP Register. This proportion is a measure of the completeness of follow-up of women with high-grade cytology.

Each woman with a high-grade cytology result, relating to a cytology sample taken in the six months preceding the current monitoring period (i.e. sample taken in the period of 1 July - 31 December 2017), is followed for any histology samples taken on or after the date of the cytology sample. The period of time between the cytology and histology reports relating to these samples is calculated. The proportion of women with a histology report up to and including 90 days after their cytology report is calculated. Histology reports which occur prior to the cytology report are included, as long as the histology sample was not taken before the cytology sample, to allow for differences in turnaround times between cytology and histology.

Analyses were also performed which calculated the proportion of women with a high-grade cytology result who have a histology report within 180 days of their cytology report.

For the purposes of this indicator, the following Bethesda 2001 (New Zealand modified; TBS 2001 NZ modified)[18] interpretation codes are included as high-grade cytology: ASH, HS1, HS2, SC, AG1-AG5, AIS, AC1-AC5. Within this group, women are considered as having an urgent referral, due to suspicion of invasive disease if they have an interpretation code of HS2, SC, or AC1-AC5 and/or a recommendation code of R10 or R14.

High-grade cytology reports that indicated women were already under specialist management (TBS 2001 NZ modified recommendation code R13) are excluded. After these are excluded, follow-up of women who have more than one high-grade cytology sample is based on the first cytology sample collected in the period.

Note that some women may be assessed at colposcopy but have no biopsy taken. The colposcopy visit data for this group of women (Indicator 7.1) will supplement this indicator. An exploratory analysis was also performed here which calculated the proportion of women with high-grade cytology who had no follow-up test of any kind (including colposcopy, histology sample, HPV sample, or subsequent cytology sample) within 180 days.

Note that the Programme also attempts to facilitate the follow-up of all women with absent histology so that they may receive appropriate care where possible.

A woman's age is defined as her age at the end of the current monitoring period (i.e. A woman's age at 30 June 2018).

Target	90% of women should have a histology report within 90 days of their cytology report date. 99% of women should have a histology report within 180 days of their cytology report.
Current Situation	There were 2,819 high-grade cytology results relating to samples collected in the period 1 July - 31 December 2017; 1,110 of these cytology samples were collected at a colposcopy visit or the results indicated that a woman was already under specialist management. It was assumed that these results were already being followed up in the course of this management, and so the cytology tests were excluded from this measure. This left 1,709 cytology results, which related to 1,706 women. Histological follow-up for these 1,706 women is considered in this indicator. Where women had more than one high-grade cytology result relating to a sample taken in the period, histological follow-up of the earliest cytology sample taken in the period was assessed. ***Histological follow-up*** Nationally, 1,433 women (84.0%) had a histology report within 90 days of their cytology report, and 1,520 (89.1%) had a histology report within 180 days. These were below the targets of 90% within 90 days and 99% within 180 days. The proportion of women with a histology report varied by DHB from 72.7% (West Coast) to 93.8% (South Canterbury) within 90 days of their cytology report, and from 81.8% (Counties Manukau and West Coast) to 97.1% (Whanganui) within 180 days of their cytology report (Figure 62, Table 12). Three DHBs met the target for the proportion of women with histology within 90 days (Nelson Marlborough, South Canterbury and Whanganui with 91.2%, 93.8% and 91.4% of histology reported within 90 days of a high-grade cytology report, respectively), however no DHB met the target for 180 days. As shown in Table 12, some DHBs had a relatively small number of women with a high-grade cytology result recorded in the period (including Wairarapa and West Coast, with 14 and 11 women with a high-grade result respectively), and this should be taken into account when interpreting these results. The proportion of women with a histology report also varied by age. Among women aged 20-69 years, the proportion varied from 57.9% (ages 60-64) to 91.0% (ages 40-44 years) within 90 days, with the target being met only for women in the 40-44 years age group. The target was not met in any age group for 180 days and ranged from 73.7% (ages 60-64 years) to 93.8% (ages 40-44 years) within 180 days (Table 13). There was some variation by ethnicity in the proportion of women with histological follow-up, however the targets were not met for any group of women. At 90 days, the proportion of women with histological follow-up ranged from 71.1% (Pacific women) to 86.5% (Asian women; Table 14). By 180 days, however, the difference had narrowed, and the proportion with histology reports ranged from 80.7% (Pacific women) to 90.3% (European/ Other

women; Table 15). Further breakdown by DHB and ethnicity is also shown in Table 14 and Table 15, and breakdown by DHB and age is shown in Table 64 and Table 65.

Among women with an urgent referral, due to a suspicion of invasive disease, (N=43), a histology report was available within 90 days for 86.0% of women and within 180 days for 93.0% of women (Table 16). Among the remaining women where there was no suspicion of invasive disease (TBS 2001 NZ modified Bethesda codes ASH, HS1, AG1-AG5, AIS), 83.9% had a histology report available within 90 days and 89.0% within 180 days.

Women with no follow-up tests

When follow-up tests of any kind (colposcopy, histology, HPV test, or subsequent cytology test) were considered, there were 140 women (8.2%) who had no record of any subsequent follow-up within 90 days and 94 women (5.5%) who had no record of any subsequent follow-up within 180 days on the NCSP Register (Table 17).

This varied by DHB, from no women without follow-up (Whanganui) to 27.3% (West Coast) of women without a record of follow-up of some kind by 90 days, and from no women (Hawke's Bay, Lakes, Whanganui) to 18.2% (West Coast) of women without a record of follow-up of some kind by 180 days (Figure 63, Table 17). Among the DHBs where there remained women without a record of follow-up at 90 days, the number was generally small (ten or fewer women in 15 DHBs) and was a maximum of 23 women (14.9%) in Counties Manukau. At 180 days, the number remaining without a record of follow-up was ten or fewer in 17 DHBs, with a maximum of 17 women (11.0%) without a record of follow-up in Counties Manukau.

The proportion of women who had no record of any subsequent follow-up also varied by ethnicity, from 6.3% (European/ Other women) to 18.1% (Pacific women) at 90 days and from 4.1% (European/ Other women) to 12.0% (Pacific women) at 180 days (Table 18, Figure 64).

Among women with an urgent referral, due to a suspicion of invasive disease, a follow-up test of some kind was available within 90 days for 86.0% of women and 93.0% within 180 days (Table 16). At 180 days, there remained three women (7.0%) for whom no follow-up tests were recorded. Among women where there was no suspicion of invasive disease, 91.9% had a follow-up test report available within 90 days and 94.5% within 180 days (Table 16). At 180 days, there remained 91 women (5.5%) for whom no follow-up tests were recorded.

Trends

Histological follow-up

The proportion of women with a histology report within 90 days has increased since the previous monitoring period (from 83.0% to 84.0% in the current period). The proportion of women with a histology report within 180 days has increased slightly (from 88.3% in the previous period to 89.1% in the current period).

While the proportion of women with histological follow-up at 90 days and 180 days has increased overall, this still varies for individual DHBs (Figure 65, Figure 66). In six DHBs the proportion of women with histological follow-up has decreased at 90 days and at 180 days (Canterbury, Hutt Valley, Northland, Southern, Tairawhiti and Taranaki). In eleven DHBs, the proportion of women with histological follow-up increased at both 90 days and at 180 days (Auckland, Bay of Plenty, Capital & Coast, Hawke's Bay, Lakes, Mid Central, Nelson Marlborough, South Canterbury, Waikato, Waitemata and Whanganui).

The proportion of women with follow-up histology at 90 days in the current monitoring period has increased since the previous report for Māori women (from 78.9% to 80.3%), Pacific women (from 68.6% to 71.1%) and Asian women (from 77.6% to 86.5%); and has remained similar for European/ Other women (from 85.7% to 85.4%) with follow-up histology within 90 days over the last two monitoring periods. The proportion of women with follow-up histology at 180 days has remained similar for Māori women (from 86.1% to 86.2%) and European/ Other women (from 90.2% to 90.3%) and has increased for the remaining ethnic groups (76.7% to 80.7% for Pacific; and 84.1% to 89.4% for Asian woman). The proportions of women with follow-up histology are quite variable within individual DHBs when broken down by DHB and ethnicity, as the number of women with high-grade cytology generally becomes comparatively small when broken down in those categories (except in some cases such as for European/ Other women, and Māori women in a few DHBs). Trend charts for ethnicity can be seen in Figure 67 and Figure 68.

As in previous reports, the proportion of women with histological follow-up varied substantially by age, and is generally lower in women aged 50 years or more, than in women younger than 50 years. Increases in the proportion of women with histological follow-up were seen in five of the ten age groups at 90 days follow-up, and in four age groups at 180 days. Decreases were seen in the five-year age groups between 30-49 and 60-64 years for both 90 and 180 days, and 55-59 years at 180 days.

Women with no follow-up tests

The proportion of women with no record of a follow-up test has remained similar when compared to the previous report at 90 days (from 8.5% to 8.2% in the current report), and at 180 days (from 5.7% to 5.5%).

Trends by DHB were complex, but the proportion of women with no follow-up test recorded at 180 days reduced in nine of the 20 DHBs, and the reductions were greatest in Hawke's Bay (decrease of 6.6%). Increases were observed in the remaining 11 DHBs and was largest in West Coast (increase of 12.6%).

In the current monitoring period, the proportion of women for whom there was no follow-up test recorded has been stable at 90 days between the current and previous monitoring reports for all ethnics groups (Māori women from 13.3% to 12.6%; Pacific women from 17.4% to 18.1%; Asian women, 9.4% in both reports; and European/ Other women from 6.6% to 6.3%). At 180 days

there was an increase in the number of women with no follow-up for Pacific women (by 1.5%, from 10.5% to 12.0%) and Asian women (by 1.1%, from 7.1% to 8.2%). For Māori women, however, a decrease was observed at 180 days from 9.5% to 8.2% but remained fairly consistent for European/ Other women (4.3% to 4.1% at 180 days).

Comments

The proportion of women with a follow-up test of any kind provides useful additional information. While 16.0% of women with high-grade cytology reports had no record of a histology report within 90 days, the proportion without a record of a follow-up test of any kind was much lower (8.2%). The same was also true at 180 days, where 10.9% of women with high-grade cytology reports had no record of a histology report within 180 days, but the proportion without a record of a follow-up test of any kind was much lower (5.5%). Consistent with previous monitoring reports, many of the women with no follow-up histology recorded do have a record of some follow-up test. This provides reassurance that many women without histology have not been lost to follow-up.

The measure of whether or not there has been a follow-up test of any sort considers cytology, colposcopy, histology and HPV tests. Therefore, changes in women with a follow-up test of any kind may also reflect changes in the completeness of reporting colposcopy data to the NCSP Register. This is expected to improve now that the time period of the data used to report on this indicator is after all DHBs began electronically reporting 2013 Colposcopy Standards data to the Register for the full reporting period.

Note that some women presenting with high grade glandular cytology or cancer may be referred directly to gynae-oncology and therefore not be recorded on the NCSP Register. While these represent a small number of women in absolute terms, they are potentially a noticeable proportion of the women with an urgent referral (for example, the three women with no follow-up within 180 days). This may have contributed to the lower rates of follow-up recorded for women with an urgent referral, due to a suspicion of invasive disease.

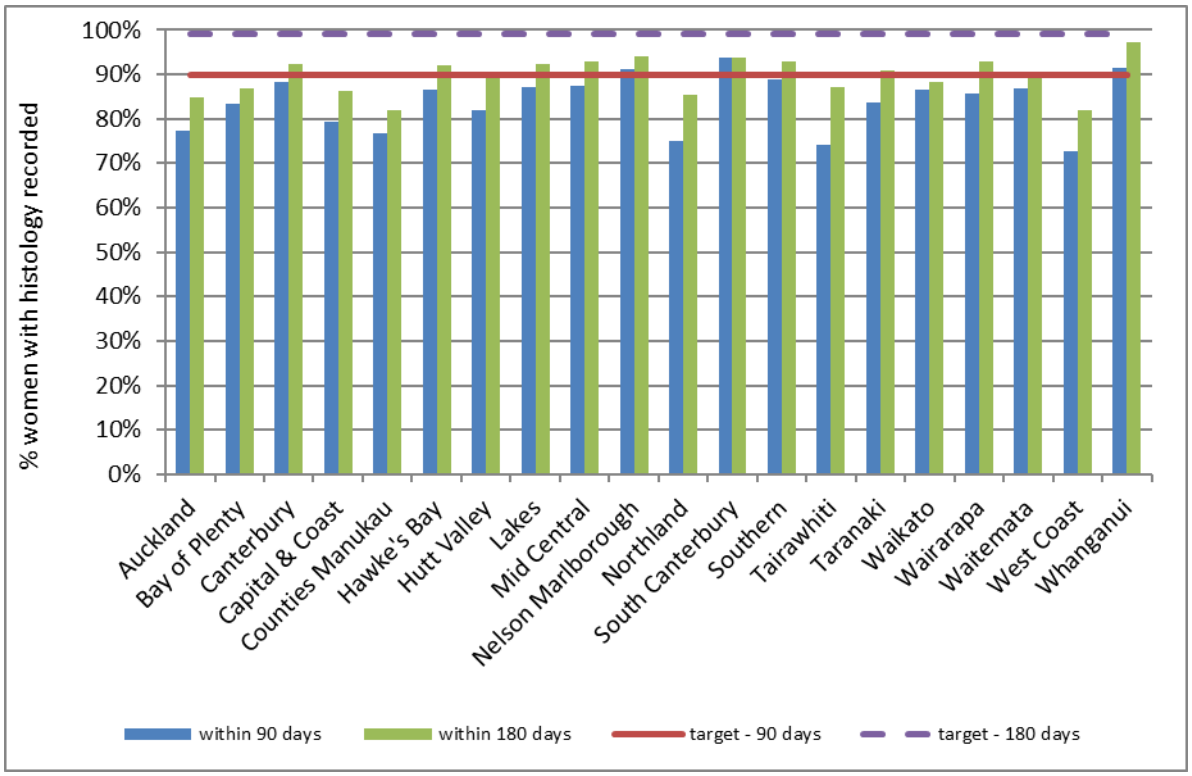
Note that while all *cytology results* which indicated that a woman was under specialist management were excluded from the measure of follow-up, not all *women* who had these cytology results were. If all cytology results for a woman indicated that she was under specialist management, she was excluded. However, any woman with at least one high-grade cytology result which did *not* indicate that she was under specialist management was included in the group in whom histological follow-up was measured. It was assumed that any high-grade cytology result without this indication should have been followed up in some way, regardless of other cytology results in the period. All of the cytology tests selected for follow-up indicated that referral or further assessment was recommended.

The risk level for women with no recorded biopsy is difficult to ascertain because a lack of histology can be due to a number of reasons, including:

i) examined but no biopsy taken,
ii) did not attend (DNA) or refusal to attend
iii) wait time issue
iv) died or left New Zealand

Risk is also related to the degree of abnormality including microinvasive/ invasive carcinoma. Women who do not or refuse to attend are at highest risk due to no colposcopic examination. Due to the significant risk for this group of women if not followed up, NCSP Portfolio Managers ensure that priority is given to follow-up of these women through DHBs.

Figure 62 - Proportion of women with a histology report within 90 days, and within 180 days of their high - grade cytology report, by DHB



Target: 90% within 90 days; 99% within 180 days.

Table 12 - Women with a histology report within 90 and 180 days of a high-grade cytology report, by DHB

DHB	High-grade cytology	Follow-up histology within 90 days		Follow-up histology within 180 days	
	N	N	%	N	%
Auckland	199	154	77.4	169	84.9
Bay of Plenty	84	70	83.3	73	86.9
Canterbury	197	174	88.3	182	92.4
Capital & Coast	87	69	79.3	75	86.2
Counties Manukau	154	118	76.6	126	81.8
Hawke's Bay	75	65	86.7	69	92.0
Hutt Valley	39	32	82.1	35	89.7
Lakes	39	34	87.2	36	92.3
Mid Central	71	62	87.3	66	93.0
Nelson Marlborough	68	62	91.2	64	94.1
Northland	48	36	75.0	41	85.4
South Canterbury	16	15	93.8	15	93.8
Southern	125	111	88.8	116	92.8
Tairawhiti	31	23	74.2	27	87.1
Taranaki	55	46	83.6	50	90.9
Waikato	155	134	86.5	137	88.4
Wairarapa	14	12	85.7	13	92.9
Waitemata	203	176	86.7	183	90.1
West Coast	11	8	72.7	9	81.8
Whanganui	35	32	91.4	34	97.1
Total	**1,706**	**1,433**	**84.0**	**1,520**	**89.1**

Table 13 - Women with a histology report within 90 and 180 days of a high-grade cytology report, by age

Age (years)	High -grade cytology	Follow-Up histology Within 90 days		Follow-up histology Within 180 days	
	N	N	%	N	%
<20	2	2	100.0	2	100.0
20-24	255	220	86.3	232	91.0
25-29	330	295	89.4	304	92.1
30-34	315	270	85.7	285	90.5
35-39	212	189	89.2	195	92.0
40-44	144	131	91.0	135	93.8
45-49	110	87	79.1	95	86.4
50-54	98	75	76.5	81	82.7
55-59	95	71	74.7	76	80.0
60-64	57	33	57.9	42	73.7
65-69	52	39	75.0	44	84.6
70+	36	21	58.3	29	80.6
Total	**1,706**	**1,433**	**84.0**	**1,520**	**89.1**

Table 14 - Women with a histology report within 90 days of a high -grade cytology report, by DHB and ethnicity

	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	6	54.5	14	73.7	42	89.4	92	75.4
Bay of Plenty	13	86.7	1	100.0	1	100.0	55	82.1
Canterbury	10	76.9	2	66.7	10	100.0	152	88.9
Capital & Coast	6	85.7	4	66.7	9	90.0	50	78.1
Counties Manukau	21	67.7	20	64.5	17	77.3	60	85.7
Hawke's Bay	18	90.0	1	50.0	2	100.0	44	86.3
Hutt Valley	8	100.0	1	33.3	4	80.0	19	82.6
Lakes	13	100.0	1	100.0	1	100.0	19	79.2
Mid Central	17	85.0	1	100.0	3	100.0	41	87.2
Nelson Marlborough	4	66.7	-	-	2	100.0	56	93.3
Northland	6	66.7	1	100.0	2	66.7	27	77.1
South Canterbury	1	100.0	-	-	1	100.0	13	92.9
Southern	16	94.1	2	100.0	2	100.0	91	87.5
Tairawhiti	14	73.7	-	-	-	-	9	75.0
Taranaki	8	88.9	2	66.7	1	50.0	35	85.4
Waikato	26	86.7	2	100.0	7	58.3	99	89.2
Wairarapa	3	75.0	-	-	-	-	9	90.0
Waitemata	15	68.2	7	87.5	40	90.9	114	88.4
West Coast	0	0.0	-	-	-	-	8	88.9
Whanganui	11	91.7	-	-	3	100.0	18	90.0
Total	**216**	**80.3**	**59**	**71.1**	**147**	**86.5**	**1,011**	**85.4**

' – ' indicates there were no women in this sub-category with a high -grade cytology report

Table 15 - Women with a histology report within 180 days of a high-grade cytology report, by DHB and ethnicity

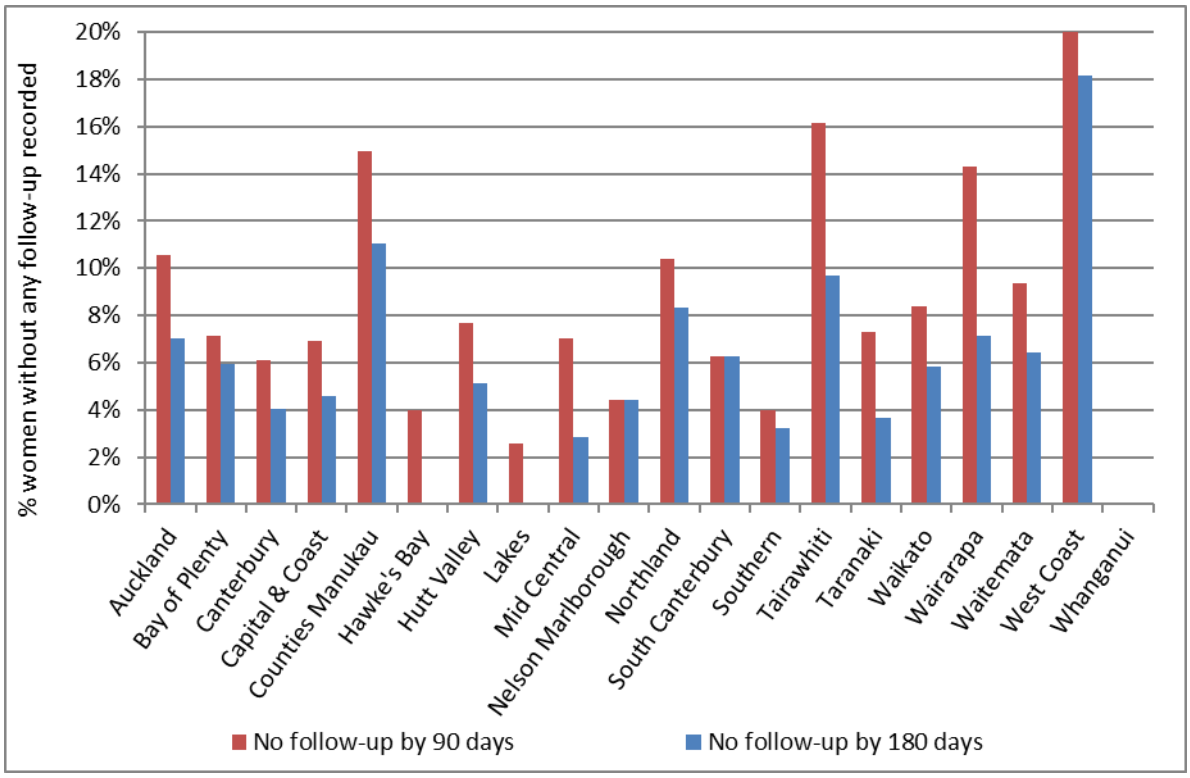
	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	7	63.6	16	84.2	43	91.5	103	84.4
Bay of Plenty	13	86.7	1	100.0	1	100.0	58	86.6
Canterbury	12	92.3	3	100.0	10	100.0	157	91.8
Capital & Coast	7	100.0	4	66.7	9	90.0	55	85.9
Counties Manukau	23	74.2	24	77.4	19	86.4	60	85.7
Hawke's Bay	18	90.0	2	100.0	2	100.0	47	92.2
Hutt Valley	8	100.0	1	33.3	5	100.0	21	91.3
Lakes	13	100.0	1	100.0	1	100.0	21	87.5
Mid Central	18	90.0	1	100.0	3	100.0	44	93.6
Nelson Marlborough	5	83.3	-	-	2	100.0	57	95.0
Northland	8	88.9	1	100.0	2	66.7	30	85.7
South Canterbury	1	100.0	-	-	1	100.0	13	92.9
Southern	16	94.1	2	100.0	2	100.0	96	92.3
Tairawhiti	16	84.2	-	-	-	-	11	91.7
Taranaki	9	100.0	2	66.7	1	50.0	38	92.7
Waikato	27	90.0	2	100.0	7	58.3	101	91.0
Wairarapa	3	75.0	-	-	-	-	10	100.0
Waitemata	16	72.7	7	87.5	41	93.2	119	92.2
West Coast	0	0.0	-	-	-	-	9	100.0
Whanganui	12	100.0	-	-	3	100.0	19	95.0
Total	**232**	**86.2**	**67**	**80.7**	**152**	**89.4**	**1069**	**90.3**

' – ' indicates there were no women in this sub-category with a high -grade cytology report

Table 16 - Women with high-grade cytology who have follow-up within 90 and 180 days recorded on the NCSP Register, by urgency of referral and type of follow-up

	Urgent referral (HS2, SC, AC1-AC5)		No suspicion of invasion (ASH, HS1, AG1-AG5, AIS)	
	N	**%**	**N**	**%**
Follow-up within 90 days				
- histology	37	86.0	1,396	83.9
- any follow-up	37	86.0	1,529	91.9
- no follow-up	*6*	*14.0*	*134*	*8.1*
Follow-up within 180 days				
- histology	40	93.0	1,480	89.0
- any follow-up	40	93.0	1,572	94.5
- no follow-up	*3*	*7.0*	*91*	*5.5*

Figure 63 - Proportion of women without any follow-up test within 90 days and within 180 days of a high-grade cytology report, by DHB



There were no women without follow-up recorded within 180 days in Lakes, Nelson Marlborough, South Canterbury, Wairarapa and Whanganui.

Figure 64 - Proportion of women without any follow-up test within 90 days and within 180 days of a high-grade cytology report, by ethnicity

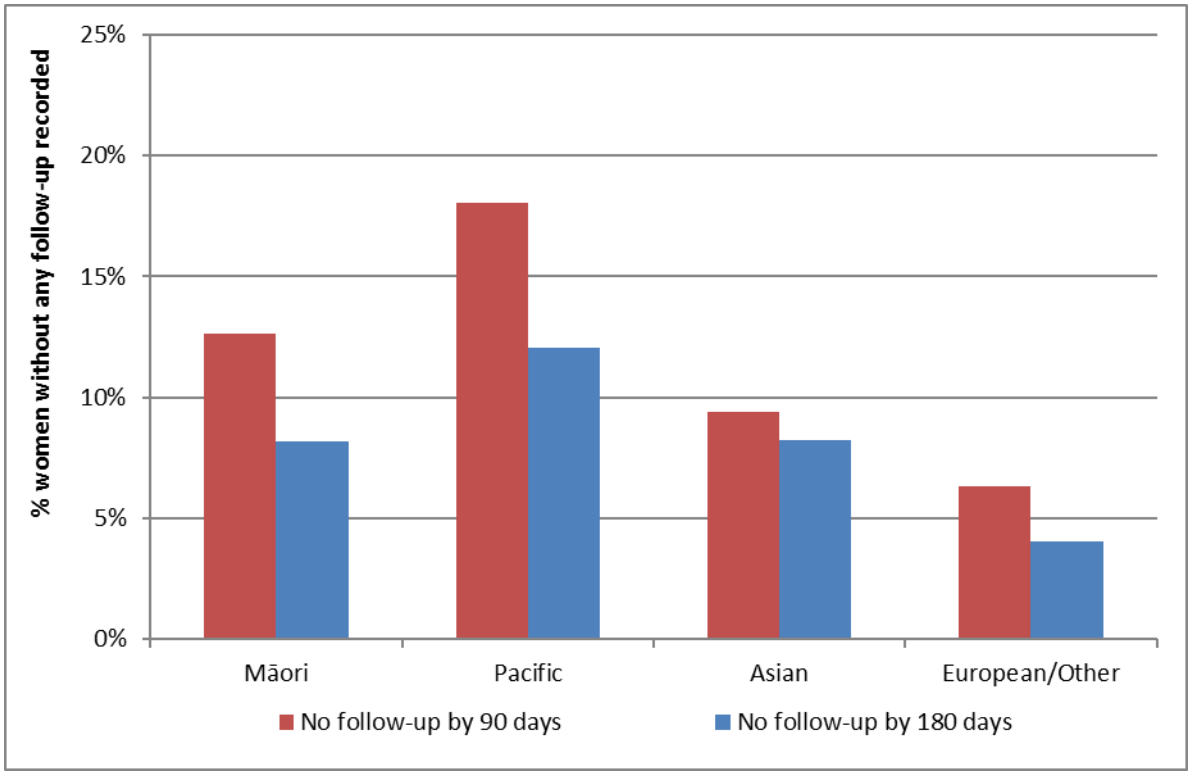


Table 17 - Women without any follow-up test within 90 and 180 days of a high-grade cytology report, by DHB

DHB	High-grade cytology N	Without a follow-up test by 90 days N	%	Without a follow-up test by 180 days N	%
Auckland	199	21	10.6	14	7.0
Bay of Plenty	84	6	7.1	5	6.0
Canterbury	197	12	6.1	8	4.1
Capital & Coast	87	6	6.9	4	4.6
Counties Manukau	154	23	14.9	17	11.0
Hawke's Bay	75	3	4.0	-	0.0
Hutt Valley	39	3	7.7	2	5.1
Lakes	39	1	2.6	-	0.0
Mid Central	71	5	7.0	2	2.8
Nelson Marlborough	68	3	4.4	3	4.4
Northland	48	5	10.4	4	8.3
South Canterbury	16	1	6.3	1	6.3
Southern	125	5	4.0	4	3.2
Tairawhiti	31	5	16.1	3	9.7
Taranaki	55	4	7.3	2	3.6
Waikato	155	13	8.4	9	5.8
Wairarapa	14	2	14.3	1	7.1
Waitemata	203	19	9.4	13	6.4
West Coast	11	3	27.3	2	18.2
Whanganui	35	-	-	-	0.0
Unspecified	-	-		-	
Total	**1,706**	**140**	**8.2**	**94**	**5.5**

Table 18 - Women without any follow-up test within 180 days of a high -grade cytology report, by ethnicity

Ethnicity	High -grade cytology N	Without follow-up by 90 days N	%	Without follow-up by 180 days N	%
Māori	269	34	12.6	22	8.2
Pacific	83	15	18.1	10	12.0
Asian	170	16	9.4	14	8.2
European/ Other	1,184	75	6.3	48	4.1
Total	**1,706**	**140**	**8.2**	**94**	**5.5**

Figure 65 – Trends in the proportion of women with high-grade cytology who have follow-up within 90 days recorded on the NCSP Register, by DHB

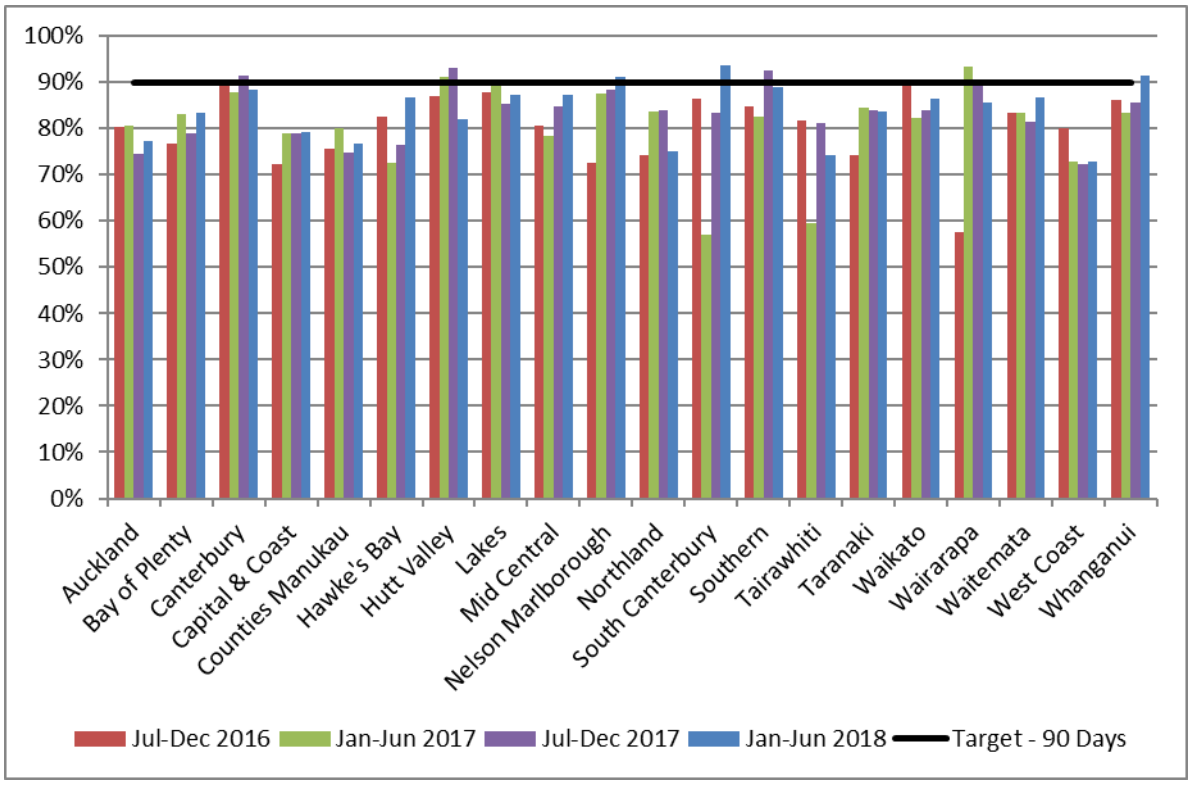


Figure 66 – Trends in the proportion of women with high-grade cytology who have follow-up within 180 days recorded on the NCSP Register, by DHB

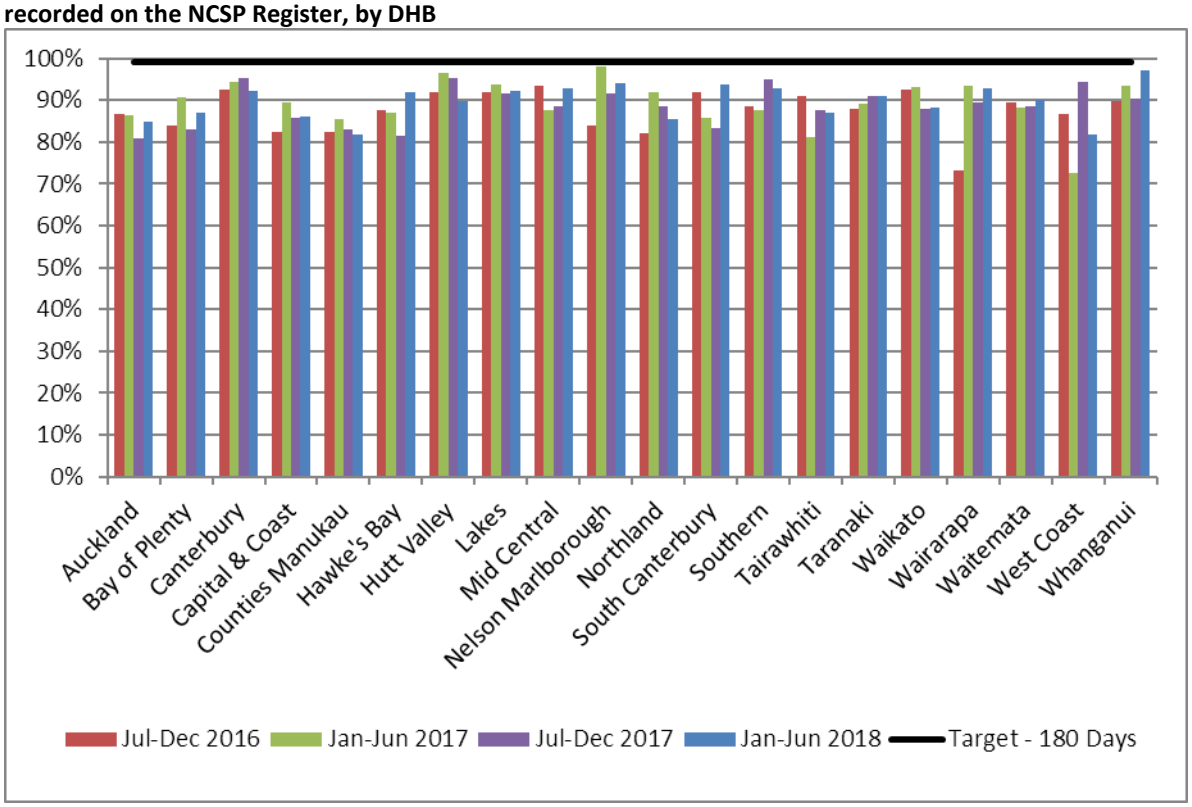


Figure 67 - Trends in the proportion of women with high-grade cytology who have follow-up within 90 days recorded on the NCSP Register, by ethnicity

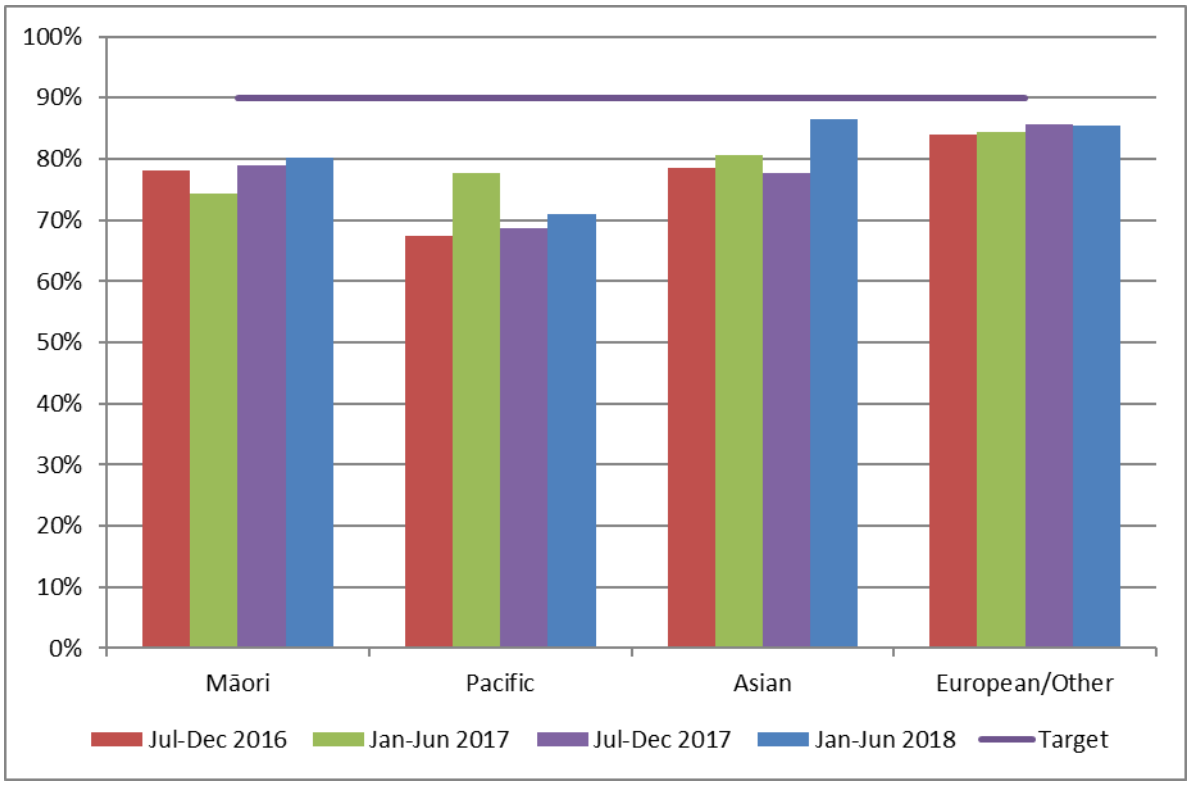
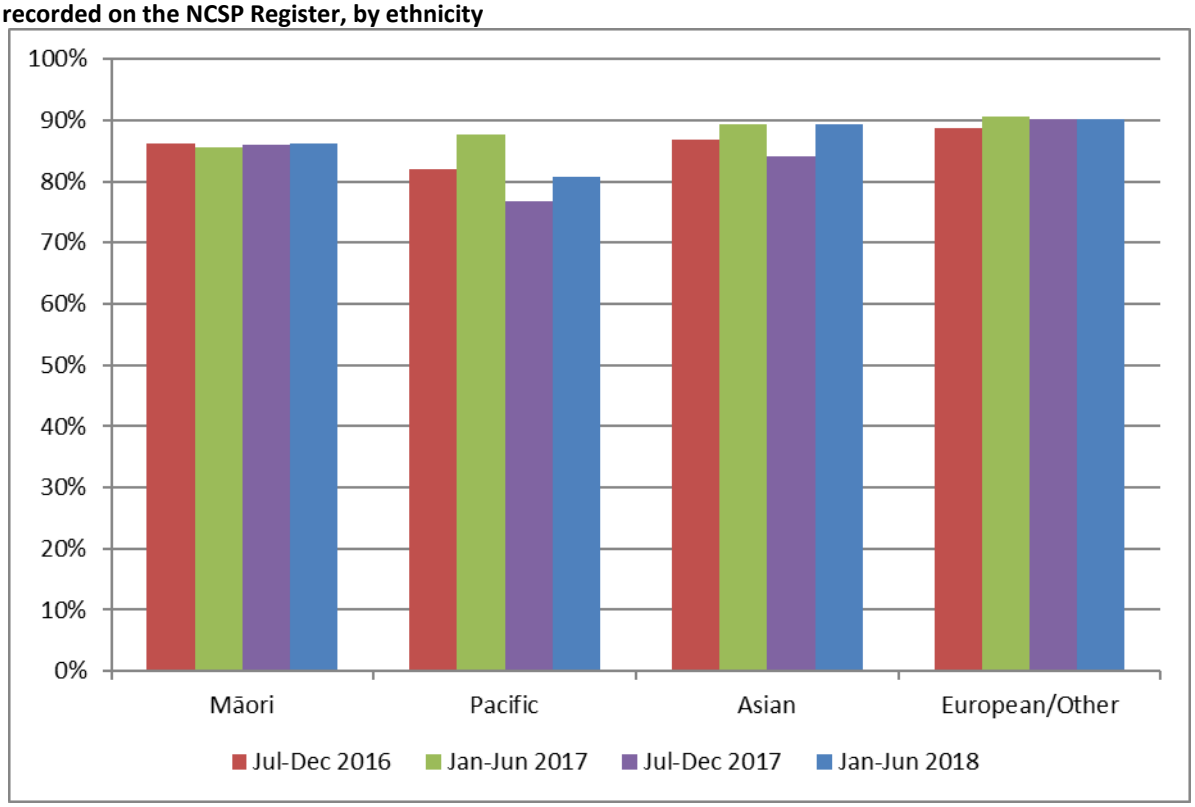


Figure 68 - Trends in the proportion of women with high-grade cytology who have follow-up within 180 days recorded on the NCSP Register, by ethnicity



Indicator 7 – Colposcopy Indicators

These indicators report on colposcopy, against the 2013 NCSP Policies and Standards, Section 6. They include the following aspects:

7.1. Timeliness of colposcopic assessment of high -grade cytology results (Standard 602)

7.2. Timeliness of colposcopic assessment of low -grade cytology results (Standard 602)

7.3. Adequacy of documenting colposcopy assessment (Standard 603)

7.4. Timeliness of treatment (Standard 605)

7.5. Timely discharging of women after treatment (Standard 608)

7.6. Failure or refusal to attend appointments (Standard 609)

7.7. Maintaining staff skill levels - minimum colposcopy volumes (Standard 611)

Some of these indicators (7.6 and 7.7) have not been developed. It is envisioned that all indicators will be reviewed as part of the planned transition to primary HPV screening, and so these may be included in future monitoring reports after the programme transitions. The current colposcopy standard was published in July 2013 (available at https://www.nsu.govt.nz/health-professionals/national-cervical-screening-programme/policies-and-standards).

Colposcopy data has been recorded on the NCSP Register for a relatively short time, compared to cytology and histology data. There is incomplete reporting of colposcopy data to the NCSP Register, and therefore results for these indicators may need to be interpreted with some caution. However, it was and is felt that colposcopy indicators were an important quality measure of the NCSP, and reporting on them should not be unduly delayed. This was also a recommendation of the 2011 Parliamentary Review into the NCSP.[19] It is anticipated that completeness of colposcopy data on the NCSP Register will continue to improve over time. The 2015 Parliamentary Review again emphasised that achieving complete recording of colposcopy data on the NCSP Register is essential. [20]

Additionally, not all DHBs were yet reporting the full data required by Colposcopy Policies and Standards 2013 for the full-time periods reported on in this report (as all indicators in this section other than 7.3 can report on colposcopy which occurred earlier than the current monitoring period); the last three DHBs went live with the 2013 Standards in August 2016. This means that in many cases performance indicators are not directly compared to the targets or have had to rely on proxy data to measure performance. Where relevant, this is described in the sections relating to the individual indicators.

Indicator 7.1 – Timeliness of colposcopic assessment – high-grade cytology

Definition

This indicator measures performance against Standard 602. It relates to the proportion of women seen at colposcopy within the recommended time period, from the time of the receipt of a referral from the sample taker for a high-grade cytology.

Timeliness is calculated using the time from the referral following the high-grade cytology result being accepted by the colposcopy unit, to the time of the woman's first colposcopic assessment at that colposcopy unit.

As in Indicator 6, high-grade cytology results are included if the cytology sample was collected in the six months preceding the current monitoring period (i.e. 1 July - 31 December 2017). High-grade cytology is defined as that associated with any of the TBS codes ASH, HS1, HS2, SC, AG1-AG5, AIS, AC1-AC5. Where a woman has more than one high-grade cytology result in the relevant time period, the result from the first high-grade cytology sample collected is used. Timeliness of colposcopic assessment is calculated separately for those women with clinical suspicion of invasive carcinoma, or a suspicion of invasive carcinoma (based on either cytological interpretation TBS codes HS2, SC, AC1-AC5 or recommendation codes R10 or R14 that may be used in the context of symptoms); and for women with other high-grade cytology results (TBS codes ASH, HS1, AG1-AG5, AIS), since the timeframes differ for these two groups.

Referrals and colposcopy visits for these women were retrieved from the NCSP Register. The standard requires that a woman be seen within a time period from when the colposcopy unit received the referral. However due to the completeness of the accepted referral date compared to the received date, referral accepted date is used in this indicator as a proxy for the date the referral was received, and the start date for calculating timeliness. Referrals were retrieved where the date on which the referral was accepted occurred after the date the cytology sample was collected, and the referral was accepted no later than four weeks prior to the end of the current monitoring period. Colposcopy visits recorded on the NCSP Register were retrieved if they occurred after an accepted referral (to the same DHB) and no later than the end of the current monitoring period. The difference of four weeks between the two was to ensure that there were at least four weeks of data following every accepted referral which could be searched for colposcopy visits. In the current report, histology data are also used to supplement colposcopy data and help ascertain if a colposcopy visit occurred. Women with a histology sample collected after their cytology sample are assumed to have attended a colposcopy clinic for follow-up on the date the histology sample was collected, even if a colposcopy visit is not explicitly recorded on the NCSP Register.

Histology results have been used by the NCSP Register to follow up missing colposcopy visit data to improve the quality of colposcopy data on the Register. During the previous and current monitoring periods all DHBs adopted electronic reporting of the 2013 Standards, with the last three DHBs going live in August 2016. This has greatly improved the data on the Register and for

public DHBs and when data are sufficiently complete future reports will be able to report directly against the 2013 Standards without using the current proxies for DHBs (with limited exceptions). Whereas, for private clinics complete reporting against the 2013 Standards is taking more time with the majority still reporting against 2008 standards. Therefore, values reported for the private aggregate will need to continue to use histology proxies (where necessary) until all private data is in accordance with the 2013 Standards.

Results are reported by ethnicity and DHB. For women who attended colposcopy, DHB is assigned on the basis of the DHB of the colposcopy facility where they attended for colposcopy. The date on which the referral to that DHB was accepted is used to calculate timeliness. If there are multiple referrals for the same woman to that DHB, the date of the first accepted referral following the cytology sample is used. Women who attended colposcopy but had no relevant referral to that DHB recorded on the NCSP Register were excluded from the calculations of timeliness (since the time between the acceptance of the referral and the colposcopy visit could not be calculated). However, these women were reported on separately.

For women who did not attend colposcopy prior to the end of the current monitoring period, DHB is assigned based on the DHB of the facility which accepted the referral for that woman (where the referral was accepted no later than four weeks prior to the end of the current monitoring period). If there were multiple referrals for the same woman which occurred after the cytology sample, the most recently accepted referral within the timeframe was used.

For women who neither attended colposcopy nor had an accepted referral with any DHB, DHB is assigned on the basis of the health facility where their high-grade cytology sample was collected.

Since cytology samples were collected in the six months prior to the current monitoring period, this allows a follow-up period of at least six months for all women (and up to 12 months for some women) where a woman can attend colposcopy and be assigned to a DHB, or alternately have a referral accepted by a DHB.

High-grade cytology tests indicating that a woman was already under specialist management (TBS=R13) were excluded from this measure.

Target	***Timeliness – high -grade cytology indicating suspicion of invasive disease***
	95% or more of women who have evidence of clinical suspicion of invasive carcinoma, or a laboratory report indicating 'features suspicious for invasion', or 'changes consistent with squamous cell carcinoma' (TBS codes HS2, SC, AC1-AC5), or similar, must receive a date for a colposcopy appointment or a gynaecological assessment that is within 10 working days from when the colposcopy unit received the referral from the smear taker/ referrer.

Timeliness – high -grade cytology (no suspicion of invasive disease)
95% or more of women who have high-grade cervical smear abnormalities (but no suspicion of invasive disease; TBS codes ASH, HS1, AG1-AG5, AIS) must receive a date for a colposcopy within 20 working days from when the colposcopy unit received the referral from the smear taker/ referrer.

The targets for this indicator rely on records of colposcopy appointments on the NCSP Register. As advised by the Ministry and NCSP Advisory Group for all women with a high-grade cytology test in the six months prior to the current monitoring period, timeliness is instead measured from the time between a referral is accepted to when women *have their first subsequent* colposcopy visit, acknowledging that this is not exactly as stated in the Standard target above.

Current Situation

In the period 1 July - 31 December 2017, there were 1,706 women with high-grade cytology results who were not already under specialist management. This comprised 43 women who had results indicating suspicion of invasive disease, and 1,663 women who had other high-grade cytology results. In total, accepted referrals were found for 1,539 (90.2%) of the 1,706 women (Table 66).

Timeliness – high-grade cytology indicating suspicion of invasive disease
Accepted referrals for colposcopy were found for 30 (69.8%) of the 43 women who had high-grade cytology indicating suspicion of invasive disease. For those with an accepted colposcopy referral recorded, referrals are broken down by the detailed cytological result in Table 69. Of these 30 women with a referral, 25 (83.3%) have a record of a colposcopy visit on the NCSP Register within ten working days of their referral, and 27 (90.0%) have a visit within 20 working days (Table 19).

Considering all 43 women with high-grade cytology indicating suspicion of invasive disease, regardless of whether or not a referral to colposcopy was recorded, a total of 41 (95.3%) have a record of a colposcopy visit prior to 30 June 2018 representing a follow-up period of at least six and up to 12 months after their high-grade cytology report.

Timeliness – high-grade cytology (no suspicion of invasive disease)
Accepted referrals for colposcopy were found for 1,509 women (90.7%) of the 1,663 women who had high-grade cytology not indicating suspicion of invasive disease. Among the women with accepted referrals, 1,142 (75.7%) were seen at colposcopy within 20 working days of their referral, and 1,381 (91.5%) were seen within 40 working days (Table 67). The proportion of women seen within 20 working days varied by ethnicity, from 67.1% (Pacific women) to 78.1% (Asian women) (Figure 69, Table 67). This proportion also varied by DHB from 33.3% (West Coast) to all women (Wairarapa) (Figure 70, Table 68).

In total, 1,576 (94.8%) of the 1,663 women with high-grade cytology (but no suspicion of invasive disease) relating to a sample collected in the period 1 July - 31 December 2017 have a record of a colposcopy visit prior to 30 June 2018

	(representing a follow-up period of at least six and up to 12 months after their high-grade cytology).
Trends	Nationally, the proportion of women with high-grade cytology indicating suspicion of invasive disease and an accepted colposcopy referral who were seen within the target timeframe (10 working days) has increased from 65.0% to 83.3%. The percentage of women with high-grade cytology indicating suspicion of invasive disease and an accepted colposcopy referral who were seen within 20 working days (90.0%) is also higher than the previous report (82.5%). The proportion of women with high-grade cytology (but no suspicion of invasive disease) and an accepted colposcopy referral who were seen within 20 working days is similar between the previous report (75.6%) and the current report (75.7%). This trend was also representative when investigated by ethnicity, with similar proportions of women with high-grade cytology and no suspicion of invasive disease seen within 20 working days in Pacific, Asian and European/ Other women in this monitoring period and the previous monitoring period. An increase was seen in Māori women (from 68.5% to 69.9%) (Figure 71). The proportion of all women with high-grade results for whom an accepted referral was available on the NCSP Register was higher in the current report compared to the previous report (90.2% in the current report; 88.2% in the previous report).
Comments	Since this indicator relies on colposcopy data in the NCSP Register, any incompleteness in reporting of referrals and colposcopy visits as at the time of the data extract from the NCSP Register (August 2018 for the current report) would lead to an underestimate of the number of women with referrals and/or follow-up colposcopy visits. In order to help address this, in the current report, histology data are also used to help ascertain if a colposcopy visit occurred. Women with a histology sample collected after their cytology sample are assumed to have attended a colposcopy clinic for follow-up, even if a colposcopy visit is not explicitly recorded on the NCSP Register. Among the 1,486 women (with or without a referral) who had a colposcopy visit by the end of the current monitoring period, there were 57 (3.8%) women where the colposcopy visit was not explicitly recorded on the NCSP Register and was inferred by using the histology result proxy. For women with high-grade cytology indicating suspicion of invasive disease, the number referred for colposcopy is likely to be an underestimation of women with appropriate follow-up. Many women referred with suspicion of invasive disease are referred directly to gynae-oncology for a cone biopsy instead of colposcopy. This likely explains the comparatively low proportion of women with SC or AC1-5 results who have a record of colposcopy referral (50% or less). Therefore, the proportion with colposcopy in this group does not fully reflect the level of performance. Additional information about follow-up tests performed in women with high-grade cytology is included in Indicator 6. The same 1,706 women (43 with

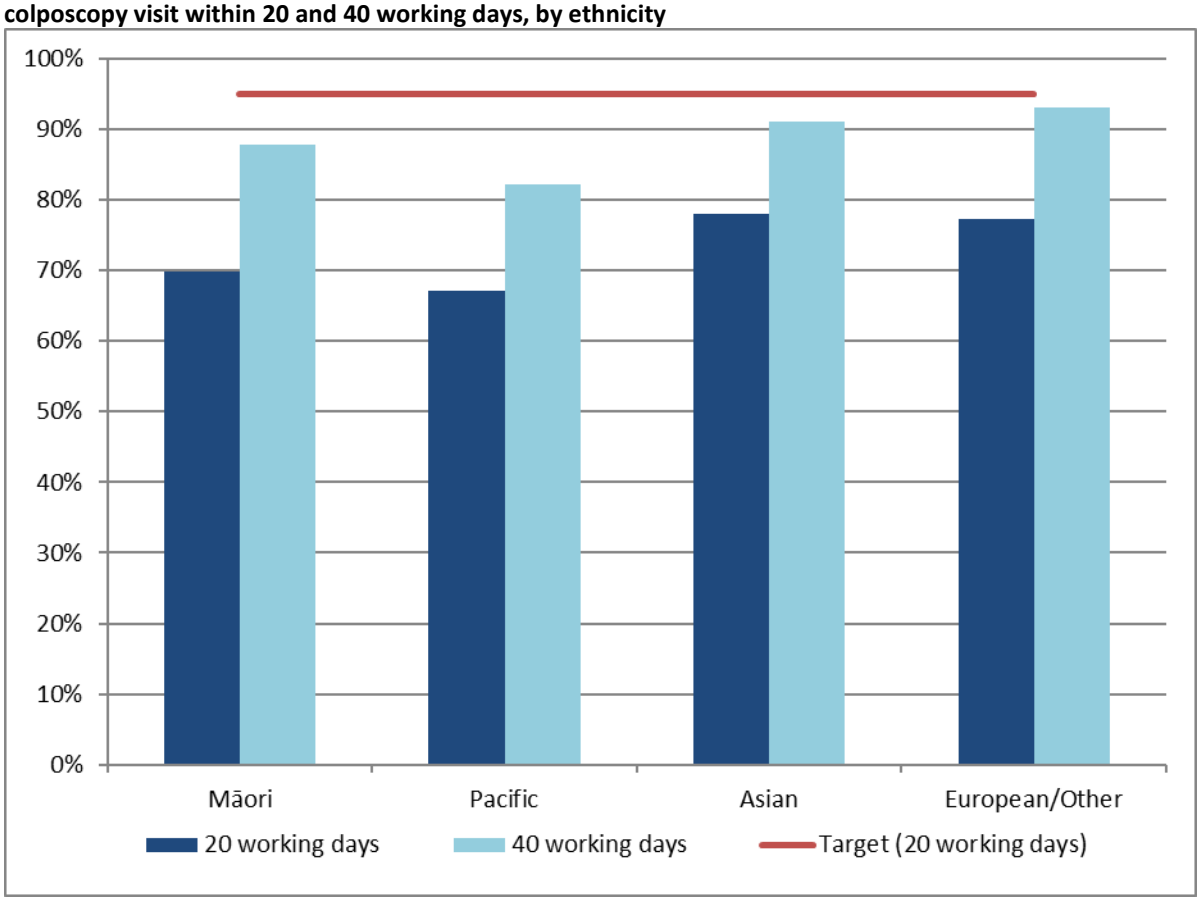
suspicion of invasive disease, 1,663 with other high-grade cytology) are included in both this measure and Indicator 6. In Indicator 6, it was found that 1,520 (89.1%) had histology within 180 days and 1,612 (94.5%) had a follow-up test of some sort within 180 days. While in this indicator, colposcopy and histology records indicate that 1,617 (94.8%) women had attended colposcopy prior to 30 June 2018 (i.e. in a period of at least 181 days and up to one year after their high-grade cytology sample). Note that there may be some differences in results by DHB, however, since in Indicator 6 the DHB assigned to a woman is her own DHB (or, where this information is not available on the NCSP Register, the DHB of her responsible health facility, based on the clinic's geographic location). In this indicator, women are assigned to a DHB based on either the DHB where they attended colposcopy, or the most recent DHB to which they have been referred (for women without colposcopy visits), or to the DHB of the health facility where the high-grade cytology sample was collected (for women with no referral and no colposcopy visit). Additionally, only public clinics are assigned a DHB within Indicator 7.1; private clinics are separated out and reported on as a group.

Reasons why a woman may not attend colposcopy within the recommended timeframe include both capacity limitations within the clinic, and potentially factors related to the woman requiring follow-up. Currently there is incomplete information available on the NCSP Register about colposcopy appointments which are scheduled for women where the woman reschedules or does not attend. Therefore, in this indicator it is not possible to distinguish delays in attending colposcopy following high-grade cytology which are due to capacity constraints which restrict the clinic's ability to offer timely appointments, and delays which may be due to an individual woman's need to reschedule an appointment or failure to attend. Factors which may lead a woman to delay a recommended visit include caring responsibilities, planned travel, competing prior commitments, illness, or menstruation.

Table 19 - Women with a high-grade cytology report (suspicion of invasive disease), accepted referral and colposcopy visit, by ethnicity

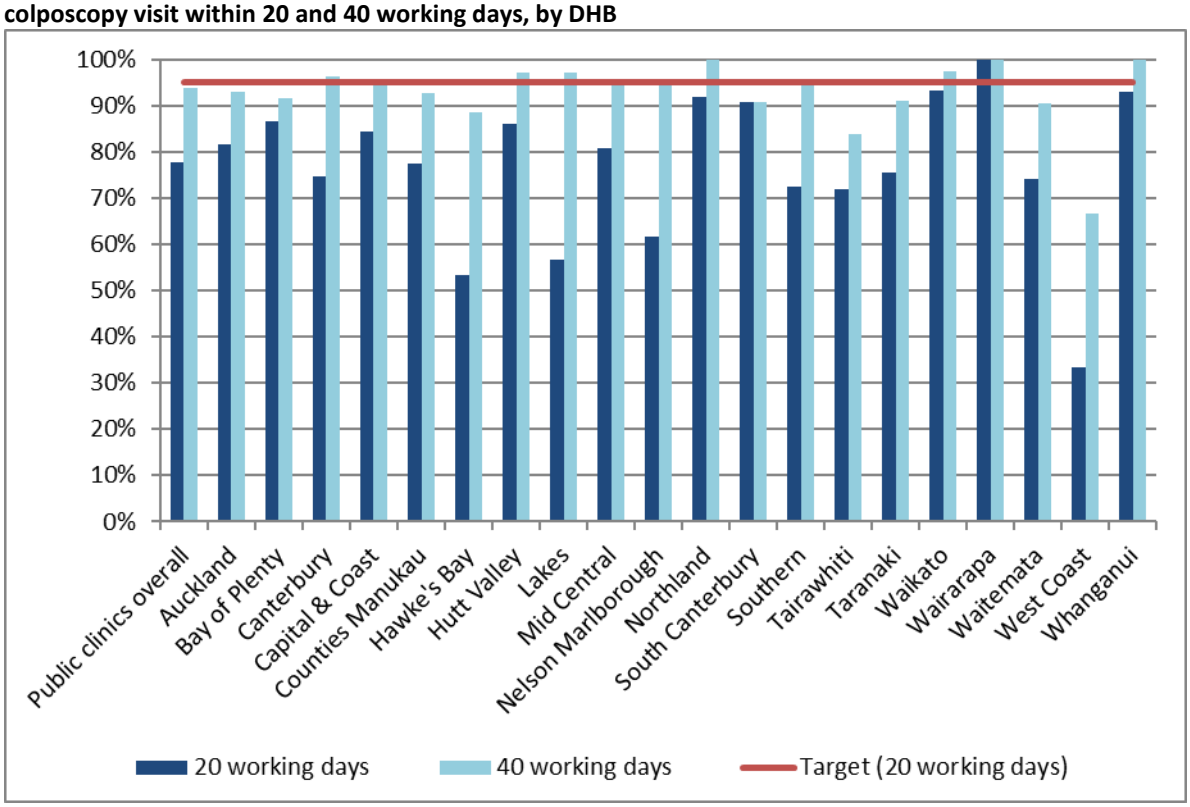
	HG women (suspicion of invasion)	Urgent referrals received	Women seen within:			
			10 working days		20 working days	
Ethnicity	**N**	**N**	**N**	**%**	**N**	**%**
Māori	12	10	8	80.0	10	100.0
Pacific	11	10	10	100.0	10	100.0
Asian	14	5	3	60.0	3	60.0
European/ Other	6	5	4	80.0	4	80.0
Total	**43**	**30**	**25**	**83.3**	**27**	**90.0**

Figure 69 - Percentage of women with a high-grade cytology (no suspicion of invasive disease) with a colposcopy visit within 20 and 40 working days, by ethnicity



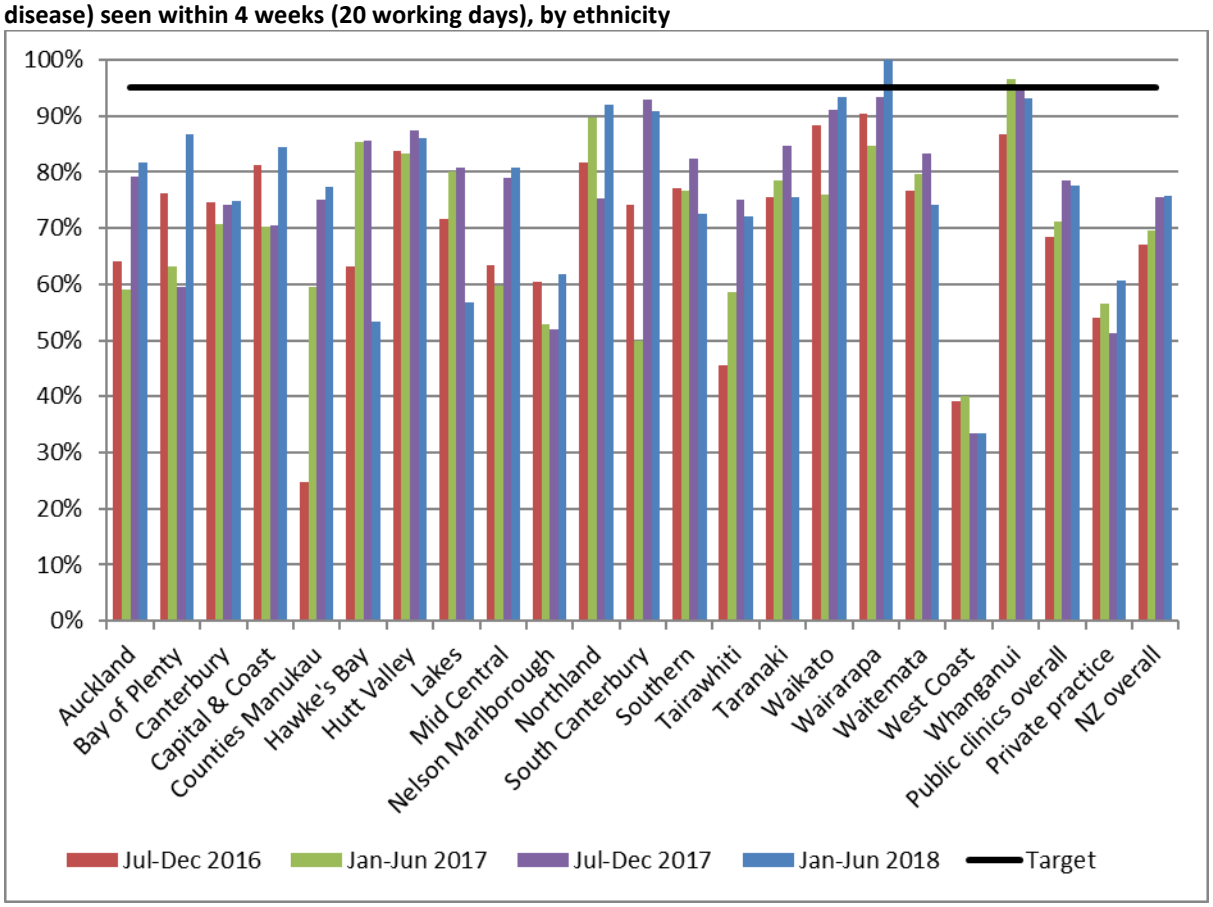
95% target relates to colposcopy visits within 20 working days

Figure 70 - Percentage of women with a high-grade cytology (no suspicion of invasive disease) with a colposcopy visit within 20 and 40 working days, by DHB



95% target relates to colposcopy visits within 20 working days

Figure 71 – Trends of the proportion of women with a high -grade cytology report (no suspicion of invasive disease) seen within 4 weeks (20 working days), by ethnicity



95% target relates to colposcopy visits within 20 working days

Indicator 7.2 – Timeliness of colposcopic assessment – low-grade cytology

Definition

This indicator measures performance against Standard 602. It reports on the timeliness of colposcopic assessment of women with either persistent low-grade cytology, or low-grade cytology and concurrent positive hrHPV test.

Women were included in this measure if they had a cytology sample collected in the 6-month period ending 12 months prior to the end of the current monitoring period (1 January – 30 June 2017 for the current report) where the results were low-grade (ASC-US or LSIL), and either a positive hrHPV test (within four weeks of the cytology result) or a previous low-grade cytology result (within the previous five years). Women undergoing test-of-cure management for a recent treatment of a high-grade squamous lesion (within the previous 4 years) were excluded.

Referrals and colposcopy visits for these women were retrieved from the NCSP Register. Referrals were retrieved where the date on which the referral was accepted occurred after the date the cytology sample was collected, and at least 26 weeks before the end of the current monitoring period (i.e. 26 weeks before 30 June 2018, to allow at least 26 weeks following the referral for colposcopy to occur). Colposcopy visits recorded on the NCSP Register were retrieved if they occurred after the cytology test and no later than the end of the current monitoring period. In addition to explicit colposcopy visit records, histology samples in the same timeframe were used as a proxy for a colposcopy visit, to supplement colposcopy visit data.

Results are reported by ethnicity and DHB. DHB is assigned in the same way as in Indicator 7.1. For women who attended colposcopy, DHB is assigned on the basis of the DHB of the colposcopy facility where they attended for colposcopy (or where the histology sample was collected if a visit is not explicitly recorded). If there are multiple referrals for the same woman to that DHB, the date of the first accepted referral following the cytology sample is used.

For women who did not attend colposcopy prior to the end of the current monitoring period, DHB is assigned based on the DHB of the facility which accepted the referral for that woman. If there were multiple referrals for the same woman which occurred after the cytology sample, the most recently accepted referral within the timeframe was used.

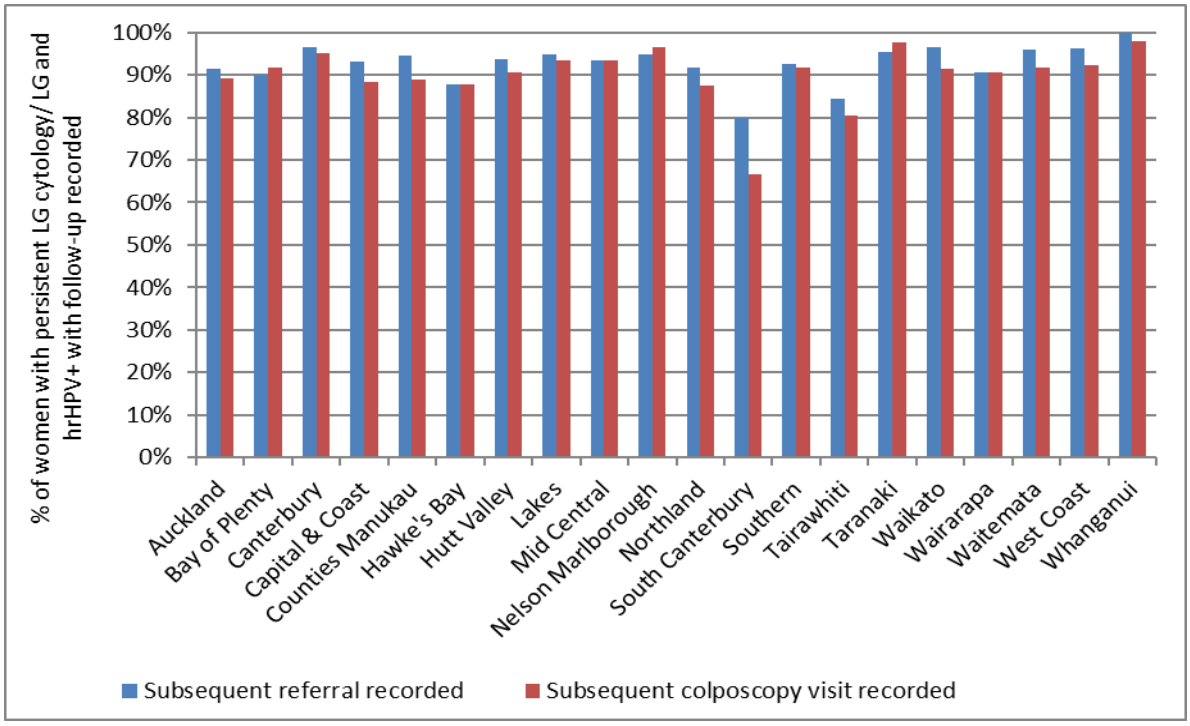
For women who neither attended colposcopy nor had an accepted referral with any DHB, DHB is assigned on the basis of the geographic region of the health facility where their low-grade cytology sample was collected.

Since cytology samples were collected in the 6-month period ending 12 months prior to the end of the current monitoring period, this allows a follow-up period of at least twelve months for all women (and up to 18 months for some women) where a woman can attend colposcopy and be assigned to a DHB.

Target	95% of women who have persistent low-grade abnormalities, or a low-grade abnormality and positive HPV test, must receive a date for a colposcopy appointment that does not exceed 26 weeks of receipt of the referral. At present, this indicator reports on aspects of follow-up, but not specifically on timeliness in relation to the standard, as the date of the first colposcopic assessment is not yet available for all women with a low-grade cytology test in the 6-month period 12-months prior to the end of the current monitoring period. In the interim, it reports on the number and percentage of women for whom a subsequent accepted referral and/ or a colposcopy visit are recorded, and the number and proportion of women who attended colposcopy within 26 weeks of an accepted referral.
Current situation	There were 3,488 women with either persistent low-grade cytology or low-grade cytology and a positive hrHPV test collected in the period 1 January – 30 June 2017. Nationally, subsequent accepted referrals are recorded for 3,017 (86.5%) of these women, and subsequent colposcopy for 3,198 (91.7%). The proportion of women for whom a subsequent referral and colposcopy visit are recorded are shown by DHB in Figure 72, and by ethnicity in Figure 73. The proportion of women for whom an accepted referral was recorded on the NCSP Register ranged from 80.0% (South Canterbury) to all women (Whanganui; Figure 72). The proportion of women with a subsequent colposcopy visit (which occurred by the end of the current monitoring period) recorded on the NCSP Register ranged from 66.7% (South Canterbury) to 98.0% of women (Whanganui; Figure 72). For ethnicity, the proportion of women for whom an accepted referral was recorded on the NCSP Register ranged from 85.0% for Asian women to 92.8% for Māori women (Figure 73). The proportion of women with a subsequent colposcopy visit recorded on the NCSP Register (regardless of whether or not a referral was recorded) ranged from 85.9% (Pacific women) to 92.6% (European/ Other women) (Figure 73). Timeliness of colposcopic assessment is provided by examining the time between when a referral is accepted for a colposcopy and when a woman attended for colposcopy. Among the 3,017 women with an accepted referral nationally, 2,679 (88.8%) women attended for colposcopy within 26 weeks of their accepted referral (Table 70). By DHB, the proportion of women who attended for colposcopy within 26 weeks of their accepted referral ranged from 56.3% (Hawke's Bay) to 98.0% women (Whanganui) (Figure 74, Table 70). By ethnicity, this figure ranged from 82.5% of Māori women attending for colposcopy within 26 weeks of their accepted referral, to 90.1% of European/ Other women (Figure 75, Table 71) Overall 2,845 women attended colposcopy following an accepted referral on the NCSP Register, and by the end of the current monitoring period (a follow-up period of 12 - 18 months after their cytology sample). This is equivalent to 81.6% of all women with persistent low-grade cytology or low-grade cytology and a positive hrHPV test, and 94.3% of women who had an accepted referral following their low-grade cytology.

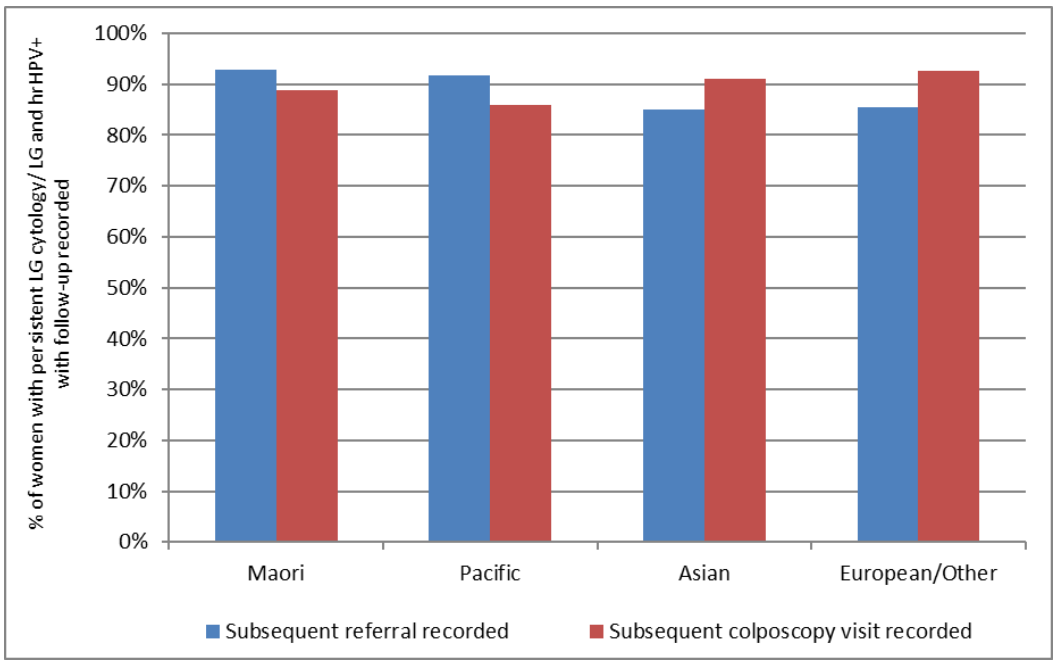
Trends	Nationally, the proportion of women with colposcopy within 26 weeks of being referred has increased (88.8% in the current report, compared to 85.1% in the previous report). This increase has been seen in Māori and European/ Other women (an increase of 8.6% and 3.5%, respectively) (Figure 77). The proportion of women seen within 26 weeks has increased since the previous report in eleven out of 20 DHBs (Figure 76). A substantial decrease (greater than 10 percentage points) in the proportion seen within 26 weeks was observed in two DHBs (South Canterbury and Wairarapa). Conversely, a substantial increase (greater than 10 percentage points) in the proportion of women with colposcopy within 26 weeks compared to the previous report was seen in two DHBs (Bay of Plenty and Waikato).
Comments	Since this indicator relies on colposcopy data in the NCSP Register, any incompleteness in reporting of referrals and colposcopy visits at the time of the data extract from the NCSP Register (late February 2018 for the current report) would lead to an underestimate of the number of women with referrals and/ or follow-up colposcopy visits. In order to help address this, in the current report, histology data are also used to help ascertain if a colposcopy visit occurred. Women with a histology sample collected after their cytology sample are assumed to have attended a colposcopy clinic for follow-up, even if a colposcopy visit is not explicitly recorded on the NCSP Register. As has been the case for previous monitoring periods, it is evident that referrals are incompletely recorded on the NCSP Register, as some women have a record of a colposcopy visit, but no record of an accepted referral.

Figure 72 - Follow-up recorded* for women with persistent LG cytology/ LG cytology and positive hrHPV test, by DHB



** For colposcopies 'follow-up' includes colposcopies recorded on the NCSP Register which occurred no later than the end of the current monitoring period, regardless of whether there is a referral or not. Referrals includes those recorded on the NCSP Register that were accepted no later than 26 weeks prior to the end of the current monitoring period. A colposcopy is assumed to have occurred if a histology sample is recorded in the relevant timeframe.*

Figure 73 - Follow-up recorded* for women with persistent LG cytology/ LG cytology and positive hrHPV test, by ethnicity



** For colposcopies 'follow-up' includes colposcopies recorded on the NCSP Register which occurred no later than the end of the current monitoring period, regardless of whether there is a referral or not. Referrals includes those recorded on the NCSP Register that were accepted no later than 26 weeks prior to the end of the current monitoring period. A colposcopy is assumed to have occurred if a histology sample is recorded in the relevant timeframe.*

Figure 74 - Women with persistent LG cytology/ LG cytology and positive hrHPV test and an accepted referral for colposcopy: percentage with a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by DHB

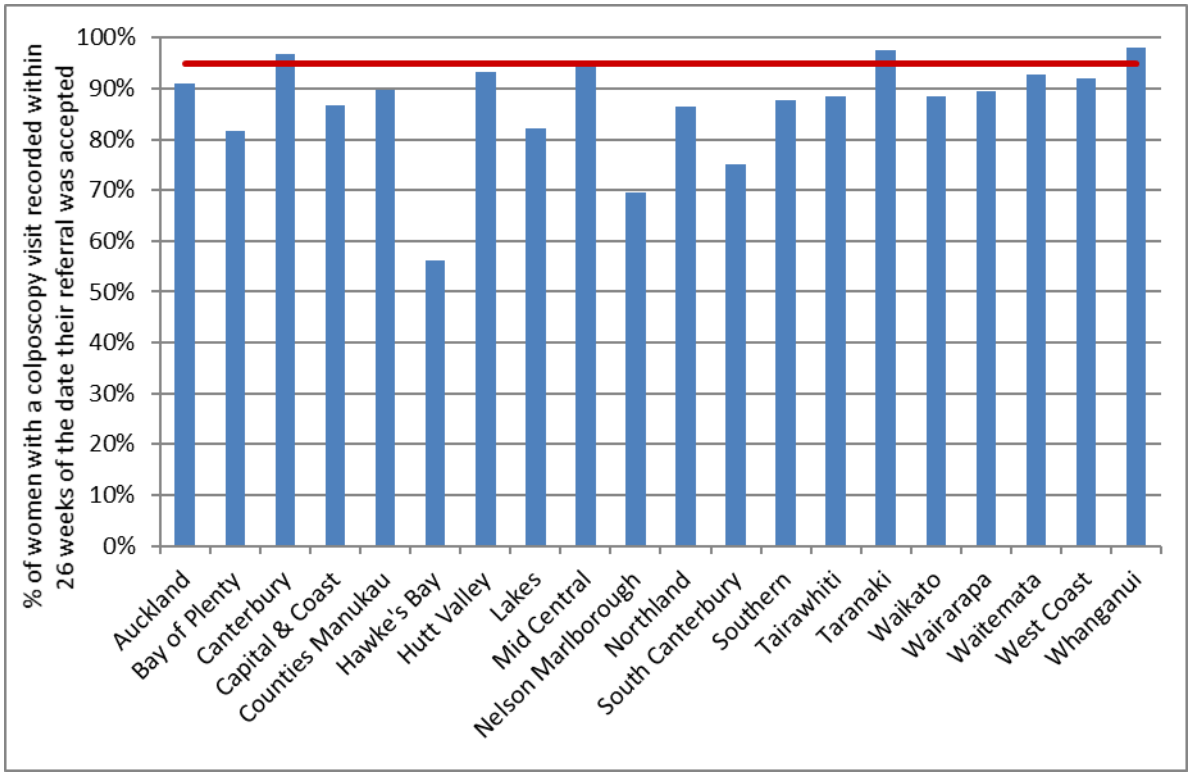


Figure 75 - Women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy: percentage with a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by ethnicity

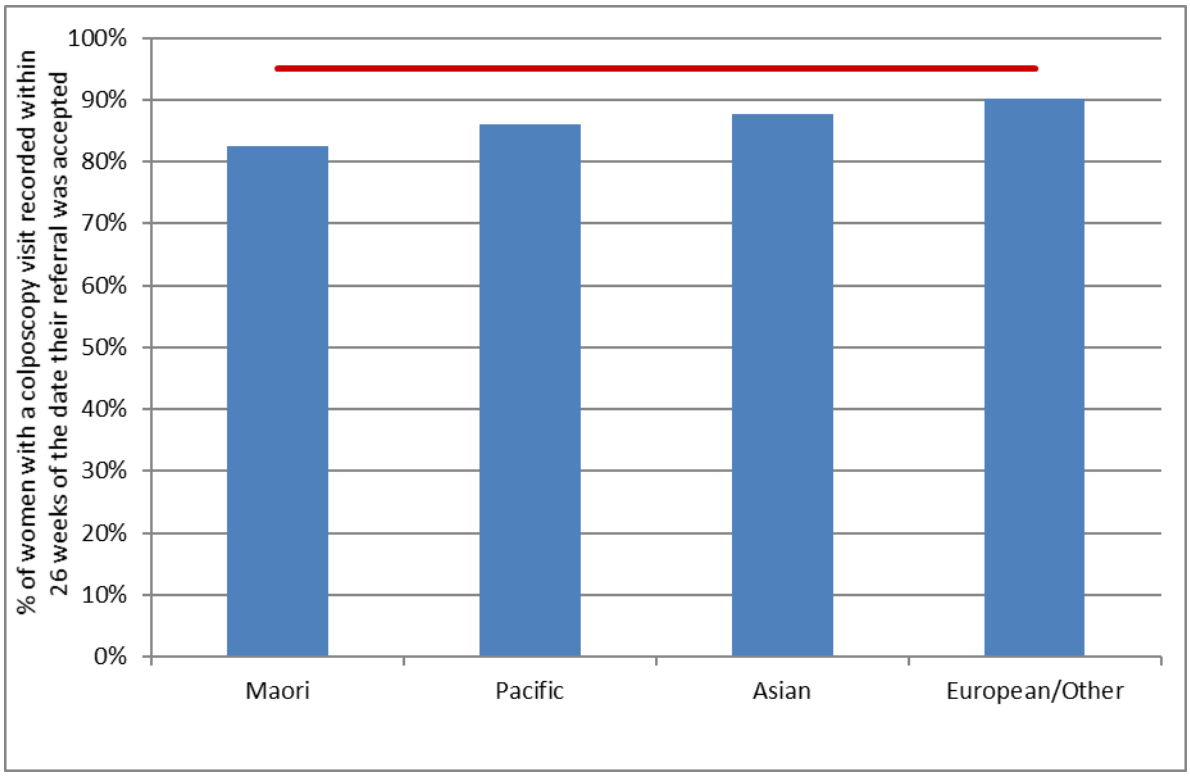


Figure 76 - Trends in the proportion of women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy who have a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by DHB

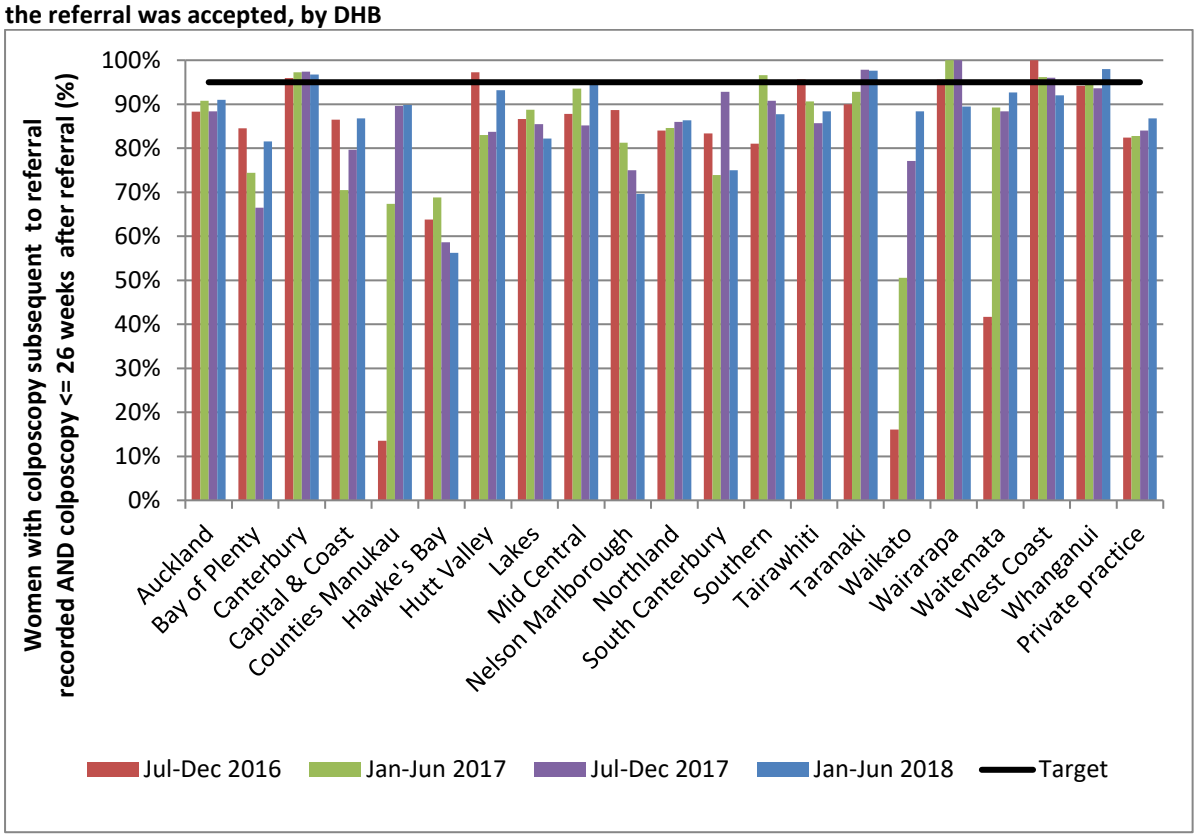
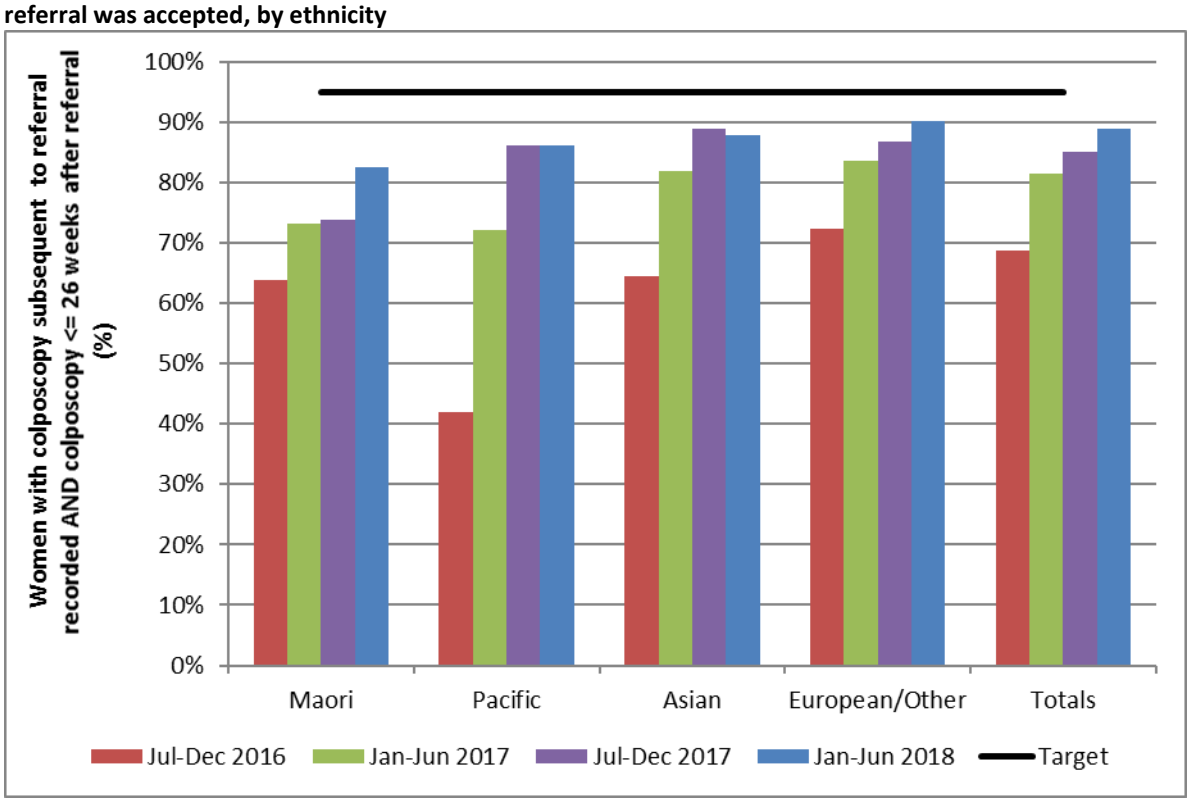


Figure 77 - Trends in proportion of women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy who have a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by ethnicity



Indicator 7.3 – Adequacy of documenting colposcopy assessment

Definition

This indicator measures performance against Standard 603.

The proportion of colposcopies which occurred within the monitoring period with complete reporting of

i) visibility of the squamo-columnar junction

ii) presence or absence of a visible lesion

iii) colposcopic opinion regarding the nature of the abnormality

iv) recommended management and follow-up

v) timeframe recommended for follow-up

vi) items i), ii), and iii) completed

Results are reported by DHB, based on the DHB of the facility where colposcopy was performed.

Target

100% of medical notes will accurately record colposcopic findings at first and any subsequent assessments, including:

i) visibility of the squamo-columnar junction

ii) presence or absence of a visible lesion

iii) visibility of the limits of lesion

iv) colposcopic opinion regarding the nature of the abnormality and the requirement for treatment

v) recommended management and follow-up

vi) timeframe recommended for follow-up.

Items i), ii), v), vi) and the first of the items in iv) can be assessed using data in the NCSP Register, and are reported on below. Item iii) and the second half of item iv) cannot currently be assessed as although all DHBs have transitioned to reporting using 2013 Standards these fields cannot be fully utilised due to a lack of completeness. For private clinics, however, complete reporting against the 2013 Standards is likely to take more time with the majority still reporting against 2008 standards. Therefore, values reported for the private aggregate will continue to use proxies for a much longer period until complete 2013 reporting occurs.

When calculating the completeness of recording of the colposcopic opinion regarding the nature of the abnormality, this was restricted to those colposcopy visits where the presence of a lesion was either noted (colposcopic appearance recorded as abnormal), or could not be ruled out (colposcopic appearance recorded as inconclusive).

When calculating the overall completeness of items i), ii), and iii), colposcopic opinion regarding the nature of the abnormality was only required where colposcopic appearance was recorded as either abnormal or inconclusive.

Current Situation

There were 12,198 colposcopy visits within the current monitoring period recorded on the NCSP Register. Documentation relating to these visits was analysed (Table 72).

Nationally, the visibility of the squamo-columnar junction was documented for 97.3% of visits; the presence or absence of a lesion was documented for all visits; and an opinion regarding the lesion grade was documented for 91.6% of visits where the presence of a lesion could not be ruled out. Additionally, the type of follow-up was documented for 95.6% of visits and the timeframe for follow-up was documented for 94.9% of visits. The visibility of the squamo-columnar junction, presence or absence of a visible lesion, and the colposcopic opinion regarding the nature of the abnormality (where relevant) were all documented for 92.6% of visits.

The colposcopic appearance was reported to be abnormal in 54.0% of colposcopies, and inconclusive in 4.9% of colposcopies (Table 73). Biopsies were taken at 92.0% of colposcopies when the colposcopic appearance was abnormal; 33.7% of colposcopies where the colposcopic appearance was reported as inconclusive, and 19.2% of colposcopies where colposcopic appearance was reported as normal (Table 74).

Documentation varied by DHB, as shown in Figure 78 and Table 72. Documentation of visibility of the squamo-columnar junction varied from 94.4% (West Coast) to 99.9% of cases in Capital & Coast. In all DHBs, all colposcopy reports documented the presence or absence of a lesion. Recording of the opinion regarding the abnormality grade (which was only assessed if the colposcopic appearance was recorded as abnormal or inconclusive), ranged from 84.2% (South Canterbury) to 98.9% (Hutt Valley). Recording of the recommended type of follow-up ranged from 86.7% (Waitemata) to all cases (Whanganui) and recording of the recommended timeframe for follow-up ranged from 85.3% (Waitemata) to all women (Whanganui). Complete documentation of the visibility of the squamo-columnar junction, presence or absence of a visible lesion, and the colposcopic opinion regarding the nature of the abnormality (where required) ranged from 86.5% (West Coast) to 98.4% (Hutt Valley) (Figure 79, Table 72).

Abnormal colposcopic appearance ranged from 36.1% of colposcopies (Northland) to 68.5% of colposcopies (West Coast). Inconclusive colposcopic appearance ranged from 0.8% of colposcopies (Hutt Valley) to 9.0% of colposcopies (West Coast) (Table 73). The proportion of colposcopies where a biopsy was taken also varied by DHB. This proportion ranged from 86.0% of visits in Auckland, up to 96.6% (Whanganui) when the colposcopic appearance was abnormal, and from 10.6% (Bay of Plenty) up to 38.2% (Wairarapa) when the colposcopic appearance was normal (Table 74).

Colposcopies performed in private practice accounted for 11.6% of all colposcopies recorded on the NCSP Register in New Zealand in the current monitoring period. The documentation rate varied according to the recorded section in private practice when compared with public clinics overall (Table 72); The proportion complete was higher in public clinics overall when compared to the private clinics overall for documenting follow-up timeframe (95.3% for public clinics; 91.8% for private practice) and follow-up type (95.8% for public clinics and 94.4%for private practice). Documentation completion rate was also higher in public clinics overall than for private clinics overall for lesion grade (91.7% for public clinics and 90.9% for private practice). The completion rate for documenting the presence or absence of a lesion was 100% in both private and public clinics. Documentation completion rate was also similar in private clinics and public clinics overall for the proportion of colposcopies documenting visibility of the squamo-columnar junction (96.7% for private practice vs 97.4% for public clinics overall). Complete documentation of the visibility of the squamo-columnar junction, presence or absence of a visible lesion, and the colposcopic opinion regarding the nature of the abnormality was higher in public clinics than in private clinics overall (92.7% for public clinics overall vs. 91.3% for private practice).

Trends

For New Zealand as a whole, documentation of colposcopy visit items has remained fairly consistent over the last four monitoring periods. In the current period visibility of the squamo-columnar junction was documented for 97.3% of colposcopies, compared with between 96.9% and 97.4% for the previous three monitoring periods. The presence or absence of a lesion was documented for all visits in both the current and previous three periods. In the current period an opinion regarding the lesion grade was documented for 91.6% of visits where the presence of a lesion could not be ruled out, compared with between 91.5% and 92.0% for the previous three monitoring periods. Recording of recommended follow-up type was documented for 95.6% of visits in the current period, which is similar to the range seen for the previous three periods (94.8% - 95.5%). This was also the case for recommended timeframe for follow-up, which was recorded for 94.9% of visits in the current period compared with 94.0% - 94.8% in the previous three periods.

Trends in the completion of all required fields by DHB are shown in Figure 79.

In total 59.2% of colposcopies had an associated biopsy compared to 59.5% in the previous report. Of these, biopsies were taken in 92.0% of colposcopies with an abnormal appearance in this report and 92.1% in the previous report. 19.2% of colposcopies with a normal appearance also had documentation of a biopsy taken in this period and 18.9% in the previous reporting periods.

Trends in the number of colposcopies recorded on the NCSP Register by DHB are shown in Figure 80. The number of colposcopies decreased in the current monitoring period in seven of the 20 DHBs with an overall decrease in the number of colposcopies of 0.7%.

Comments

This indicator is only able to assess adequacy of documentation where colposcopy visits have been entered onto the NCSP Register in accordance with the 2013 Colposcopy Standard. Therefore, it cannot provide an absolute estimate of adequacy if these data are incomplete on the NCSP Register (that is, if the colposcopy visit itself is not recorded on the NCSP Register).

Some items required by the standard, such as the recording of recommended follow-up type and timeframe, cannot necessarily be completed at the time of the colposcopy visit – for example because they will depend on results of histology tests or other reviews. For DHBs that electronically report data to the NCSP Register, the completeness of these fields is likely to lag behind that of other fields, because the colposcopy visit data will be loaded onto the NCSP Register soon after the visit and before this information is available. As more DHBs have moved to electronic reporting, this lag could explain the reduction in the percentage of colposcopies where these items are complete, compared to previous reports. Additionally, since there is a lag in reporting recommended type and timeframe for follow-up, these two items were removed from the calculation of 'all items complete' in Report 43 and this has remained the case in subsequent reports. These are often not the fields with the lowest completion rates however, and therefore removing them from the calculation made a relatively small difference to 'all items complete'. In 18 out of the 20 DHBs, the field with the lowest completion rate is the documentation of the opinion regarding the nature of abnormality grade (only required where the presence of a lesion could not be ruled out). It is possible that the low completion rate for predicted abnormality grade could be because some clinics are incorrectly interpreting the requirement to document a *predicted* abnormality grade (which should be documented at the time of colposcopy) as a requirement to document the *diagnosed* abnormality grade, which can only be done after histology results are available.

Some items in the 2013 colposcopy standard are not included in the 2008 colposcopy visit form or on the NCSP Register, in particular the visibility of the limits of the lesion, the biopsy site, and an explicit colposcopic opinion regarding the need for treatment (although a recommended follow-up timeframe is recorded, and whether follow-up is recommended with a colposcopist, oncology services, or sample taker). It is also not possible to determine the reason for the visit from the colposcopy visit form, for example if this is a first visit or a follow-up visit; or whether it was prompted by a high-grade cytology result, a low -grade cytology result which is either persistent or accompanied by a positive high-risk HPV test result, a request for referral regardless of cytology results, or another reason. As most private colposcopists were still reporting to the NCSP Register using the 2008 standard and due to the low completeness of the fields required to calculate the additional items for those DHBs using 2013 Standards, these items could not be taken into account in this indicator for the current report.

Figure 78 - Completion of colposcopic assessment fields, by DHB

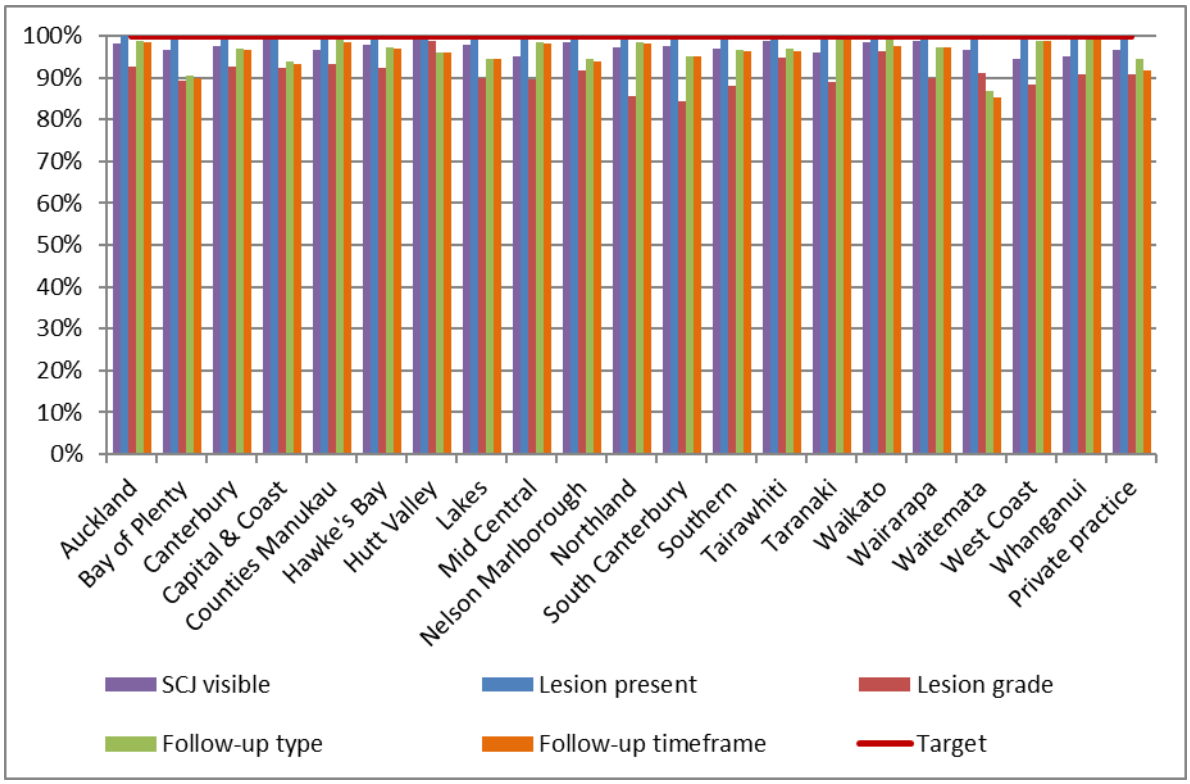


Figure 79 - Trends in the completion of all required colposcopic assessment fields, by DHB

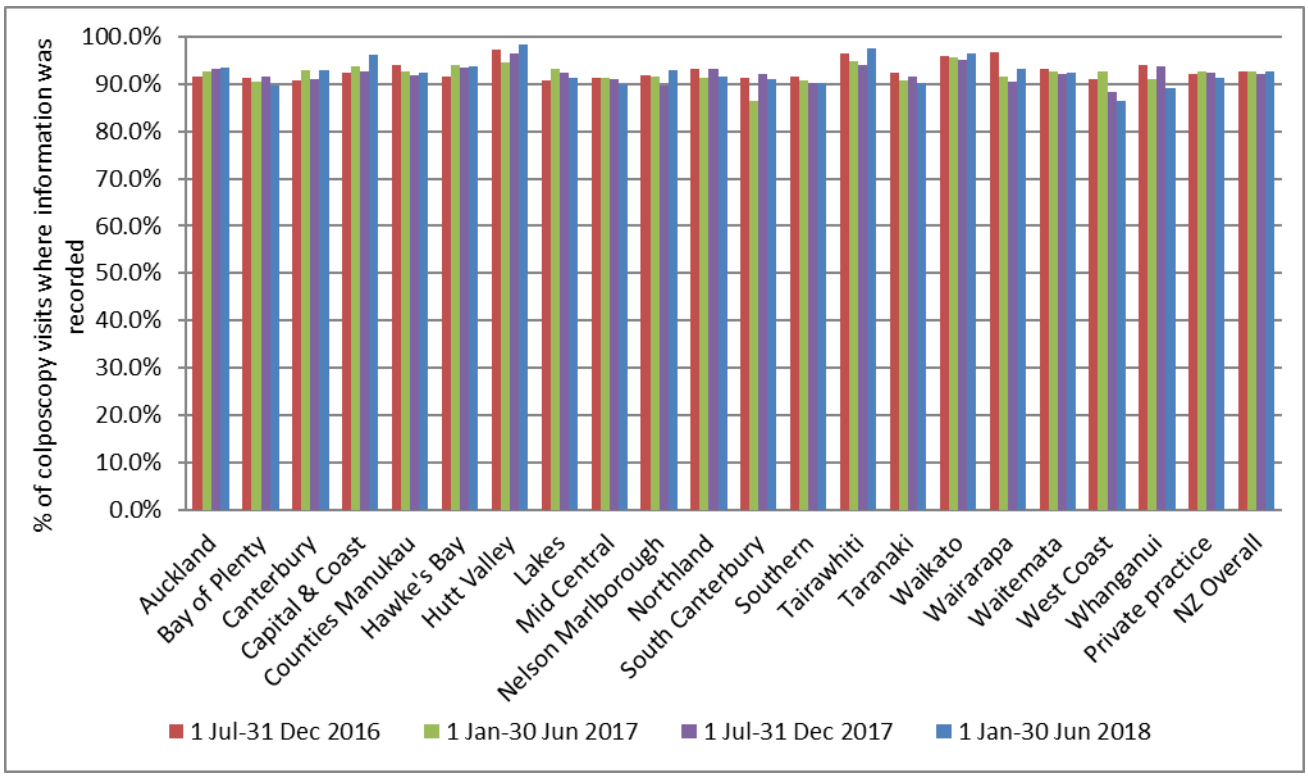
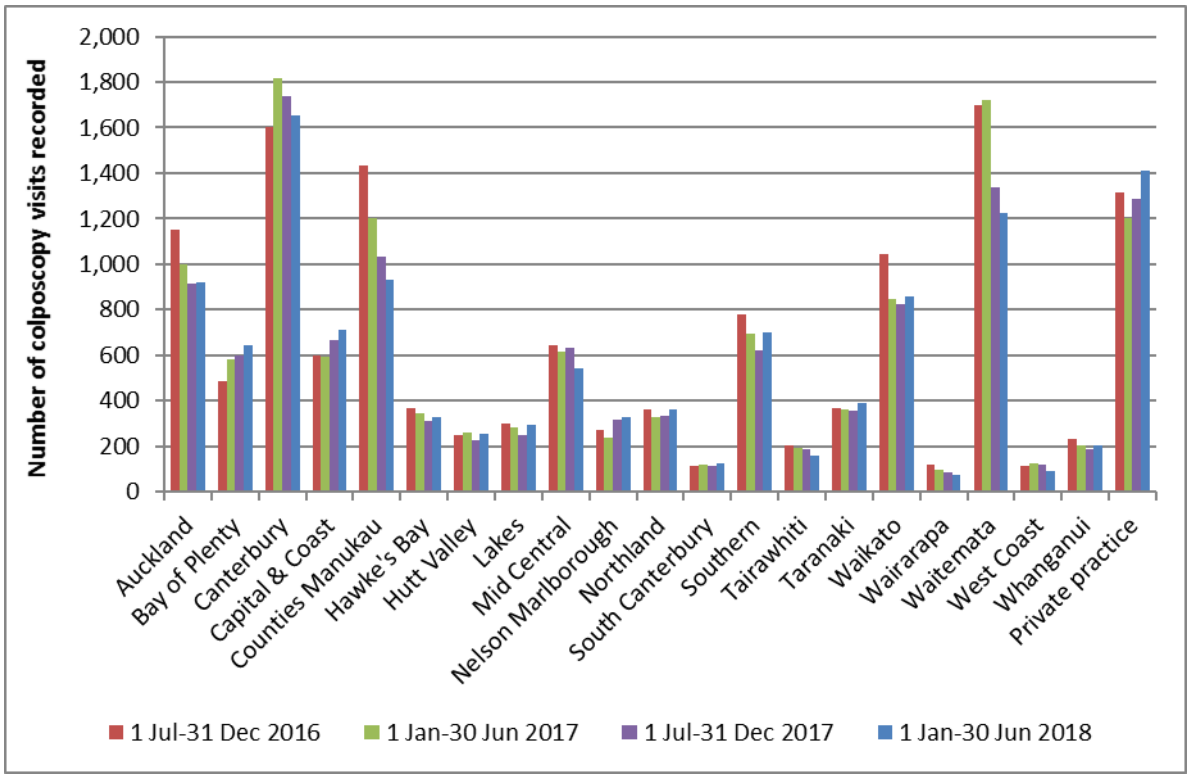


Figure 80 - Trends in the number of colposcopies recorded on the NCSP Register, by DHB



Indicator 7.4 – Timeliness and appropriateness of treatment

Definition

This indicator measures performance against Standard 605.

It reports on the proportion of women with histological high-grade squamous intraepithelial lesions (HSIL) who are treated within eight weeks of histological confirmation. Histological HSIL is defined as CIN 2, CIN 3, CIN 2/3 or HSIL not otherwise specified (SNOMED codes M74007, M74008, M80102, M80702 and M67017).

Histological LSIL is not routinely treated, as treatment is not recommended for women with low-grade abnormalities in the 2013 Colposcopy Standards (consistent with 2008 NCSP *Guidelines for Cervical Screening in New Zealand*). The 2013 Colposcopy Standard recommends that the number of women who are treated with low-grade lesions (less than CIN 2 on histology) be minimised. Therefore, treatment of LSIL is included in this report for descriptive purposes and to examine the appropriateness (not timeliness) of treatment. This report describes the number and proportion of women with histological low-grade squamous intraepithelial lesions (LSIL) who are treated. To ensure consistency in the follow-up time examined for each woman and in order to allow timely reporting, treatments are included if they occur within 26 weeks of histological confirmation. Histological LSIL is defined as CIN 1 or CIN not otherwise specified (SNOMED codes M74006, M67016, M74000 and M67015). Women with histological LSIL who are treated but who also have a record of histological HSIL in the six-month period prior to their treatment are excluded, as their treatment in considered appropriate.

Women are included in this indicator if they have a histology sample where the result is HSIL or LSIL (as previously defined, above), and the sample was collected in the six-month period immediately prior to the current monitoring period (i.e. in the period 1 July - 31 December 2017). HSIL results must have been reported at least 8 weeks prior to the end of the current monitoring period, and LSIL results must have been reported at least 26 weeks prior to the end of the current monitoring period, in order to allow sufficient follow-up time for this indicator.

Treatment was defined as a colposcopy visit where there was a record of electrosurgical excision, laser ablation or excision, cold knife cone biopsy, or total hysterectomy. Colposcopy visits involving punch biopsies only are not included.

DHB is assigned based on the clinic where the histology sample was collected.

Target

90% or more of women with HSIL are treated within 8 weeks of histological confirmation of CIN 2/3.

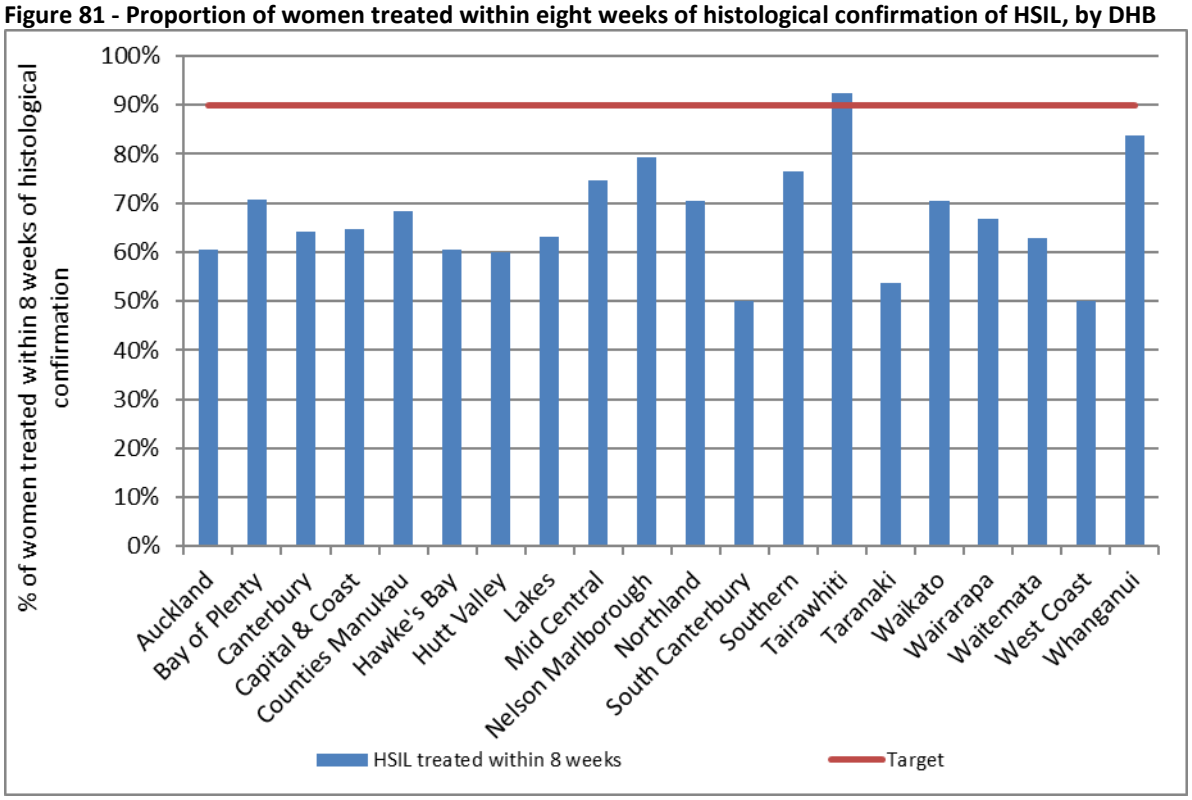
There is no explicit target relating to low-grade lesions, but the standard recommends that the number of women who are treated with low-grade lesions (less than CIN 2 on histology) be minimised.

Current Situation	There were 2,130 women with a histological diagnosis of CIN 2/3 (associated with histology samples collected in the previous six months, and reported at least eight weeks prior to 30 June 2018). Of these women, 1,359 women (63.8%) were treated within eight weeks of HSIL being histologically confirmed. The proportion of women treated within eight weeks varied widely by DHB, from 50.0% (South Canterbury and West Coast) to 92.3% of women (Tairawhiti). One DHB met the target of at least 90% of women treated within eight weeks of histological confirmation of HSIL (Figure 81, Table 20). There were 1,724 women with a histological diagnosis of LSIL (associated with histology samples collected in the previous six months, and reported at least 26 weeks prior to 30 June 2018). Treatment for histological LSIL is not routinely recommended in the 2013 Colposcopy Standards or the 2008 NCSP *Guidelines for Cervical Screening in* New *Zealand*[21], and so timeliness of treatment is not examined or compared to a target for LSIL. However, for descriptive purposes and to examine appropriateness of treatment, follow-up records were retrieved for the 1,724 women with histological LSIL. Of these women, 112 (6.5%) women were subsequently treated within 26 weeks of LSIL being histologically confirmed and had no additional record of high-grade histology in the six months preceding their treatment. The proportion of women subsequently treated varied widely by DHB, from no women (Hutt Valley, South Canterbury, Waikato and Wairarapa) to 22.2% (Hawke's Bay) (Table 20). The DHB where the largest number of women were treated was Canterbury (31 women).
Trends	Nationally, the proportion of women with histological HSIL who were treated within eight weeks of histological confirmation is similar to the previous monitoring report; 63.2% in the previous report, 63.8% in the current report. The proportion of women with histological HSIL who were treated within eight weeks for the current report period increased in five of the 20 DHBs when compared with the previous report period (Figure 82). The proportion treated within eight weeks has decreased over the last two monitoring periods in fourteen DHBs (Auckland, Bay of Plenty, Canterbury, Capital & Coast, Counties Manukau, Hawke's Bay, Hutt Valley, Lakes, South Canterbury, Taranaki, Waikato, Waitemata, West Coast and Whanganui) and remained similar in one DHB (Wairarapa). The proportion of women with histological LSIL who were subsequently treated (within 26 weeks of LSIL being histologically confirmed) has decreased, from 7.3% for the previous report to 6.5% in the current report.
Comments	Whether or not treatment has occurred is determined for this indicator via colposcopy data in the NCSP Register. Trends may reflect changes in the completeness of colposcopy data recording treatment within a DHB rather than necessarily true increases or decreases in the proportion of women treated. This incomplete recording of treatment potentially affects the results for treatments for both HSIL and LSIL. In some cases, treatment may have occurred in a different clinic to that where the original histology sample was collected. Facilities not explicitly defined as DHB (public) clinics are aggregated together as private practice. It is possible that women whose original HSIL (or LSIL) histology sample was collected

outside a DHB clinic may in practice have been treated at a DHB clinic (or conversely a woman whose histology sample was collected at a DHB clinic may have been treated outside a DHB clinic). Note, however, that timeliness is assessed here by including any treatment visits, regardless of where they occurred.

The 2013 National Cervical Screening Programme Policies and Standards: 'Section 6 – Providing a Colposcopy Service' requires colposcopy clinics to provide information about the "decision to treat date" and "date histology result is received". At present, these dates are not available to use due to low completeness of this item on the NCSP Register. It is envisioned that when this information is available for all DHBs for a full monitoring period, it will be used to calculate timeliness of treatment for women with histological HSIL.

Figure 81 - Proportion of women treated within eight weeks of histological confirmation of HSIL, by DHB



Date that histology results were reported to requesting clinician is used as the date of histological confirmation. DHB is assigned based on the clinic where the original HSIL histology sample was collected, however treatments will be included regardless of where they occurred.

Figure 82 - Trends in the proportion of women treated within eight weeks of histological confirmation of HSIL, by DHB

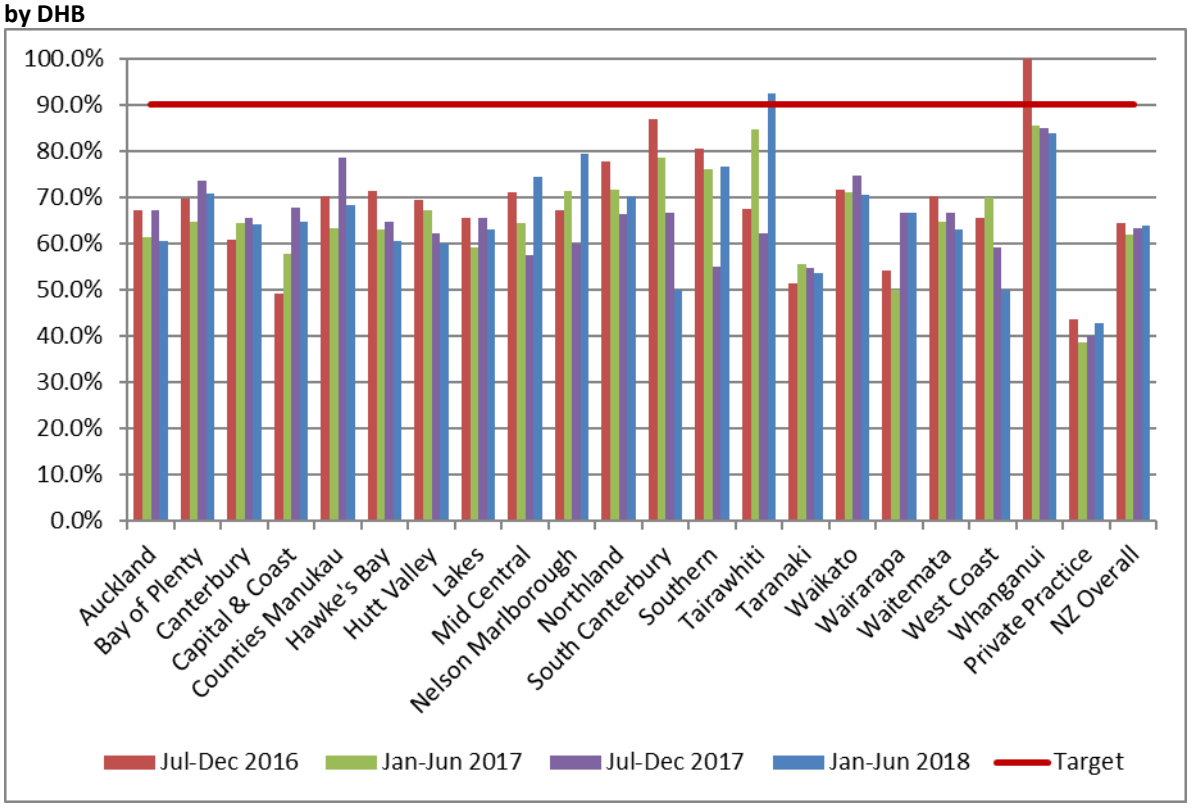


Table 20 - Timeliness and appropriateness of treatment, by DHB

DHB	Women with CIN 2/3	Treated within 8 weeks		Women with histological LSIL*	Women subsequently treated†	
	N	N	%	N	N	%
Public clinics (overall)	*1,824*	*1,228*	*67.3*	*1,391*	*101*	*7.3*
Auckland	129	78	60.5	91	7	7.7
Bay of Plenty	89	63	70.8	72	7	9.7
Canterbury	274	176	64.2	474	31	6.5
Capital & Coast	79	51	64.6	54	9	16.7
Counties Manukau	173	118	68.2	264	20	7.6
Hawke's Bay	76	46	60.5	9	2	22.2
Hutt Valley	50	30	60.0	15	-	-
Lakes	46	29	63.0	32	5	15.6
Mid Central	98	73	74.5	47	1	2.1
Nelson Marlborough	53	42	79.2	12	1	8.3
Northland	91	64	70.3	12	1	8.3
South Canterbury	18	9	50.0	3	-	-
Southern	132	101	76.5	34	2	5.9
Tairawhiti	39	36	92.3	20	3	15.0
Taranaki	69	37	53.6	21	2	9.5
Waikato	166	117	70.5	45	-	-
Wairarapa	15	10	66.7	4	-	-
Waitemata	170	107	62.9	138	7	5.1
West Coast	20	10	50.0	29	2	6.9
Whanganui	37	31	83.8	15	1	6.7
Private Practice	*306*	*131*	*42.8*	*333*	*11*	*3.3*
Total	**2,130**	**1,359**	**63.8**	**1,724**	**112**	**6.5**

DHB is assigned based on the clinic where the original HSIL histology sample was collected, however treatments will be included regardless of where they occurred.
** CIN1, CIN not otherwise specified (SNOMED codes M67015, M67016, M74000 and M74006). CIN1 is not routinely treated (consistent with 2008 NCSP Guidelines for Cervical Screening in New Zealand), so these results are not compared to a target. They appear here for descriptive purposes and to show how frequently the women with histologically confirmed LSIL were treated. † Includes women treated within 26 weeks of LSIL histology. Date that histology results were reported to requesting clinician is used as the date of histological confirmation.*

Indicator 7.5 – Timely discharging of women after treatment

Definition

This indicator measures performance against Standard 608.

It reports on the proportion of women treated for a high -grade lesion who:

- receive colposcopy within the period up to nine months after their treatment
- receive colposcopy and cytology within the period up to nine months after their treatment
- are discharged appropriately within 12 months of their treatment.

Treatment was defined as a colposcopy visit where there was a record of electrosurgical excision, laser ablation or excision, cold knife cone biopsy, or total hysterectomy. Colposcopy visits involving punch biopsies only are not included. Treatment was included if it was for a high-grade lesion (CIN 2 or CIN 3), based on histology results for any histology specimen collected concurrent with or up to six months prior to treatment.

To allow for 12 months of follow-up information to be available, this indicator reports on women treated in the six-month period ending 12 months prior to the end of the current monitoring period (i.e. 1 January - 30 June 2017). Records for each woman treated in the six-month period ending 12 months prior to the end of current monitoring period were retrieved from the NCSP Register. Among these treated women, the number of women with a colposcopy visit, and with both a colposcopy visits and a cytology sample was calculated. Follow-up colposcopy visits were not restricted to only those within the same DHB as where initial treatment occurred; rather any colposcopy visit recorded on the NCSP Register for that woman was included. Follow-up visits were retrieved for the period up to nine months after the treatment visit.

Eligibility for discharge is not explicitly defined in the NCSP Colposcopy Standard, so based on advice from the NCSP Advisory Group, women were defined as eligible for discharge if they had a colposcopy visit and cytology test following their treatment, and their cytology result was negative.

Women were defined as having been discharged when their colposcopy report form recommended follow-up by their sample taker/ referring practitioner.

Results are reported by DHB, based on the DHB of the facility where the treatment colposcopy was performed. Therefore, for the purpose of this indicator, the DHB where treatment occurred was regarded as the DHB responsible for ensuring a treated woman was followed up. However, as previously described, the follow-up colposcopy visit need not have occurred within that DHB.

Target

90% or more of women treated for CIN 2 or 3 should have a colposcopy and smear within the nine-month period post-treatment

90% or more of women treated for CIN 2 or 3 should be discharged back to the sample taker as appropriate.

Current Situation

There were 1,392 women treated for CIN 2 or CIN 3 lesions in the six-month period from 1 January - 30 June 2017. These women were followed up for 12 months from the date of their treatment visit.

Follow-up post treatment

There were 1,079 women (77.5%) with a follow-up colposcopy, and 1,063 women (76.4%) with both a follow-up colposcopy and a cytology sample in the nine month period after their treatment visit.

Figure 83 shows the percentage of treated women with a record of follow-up colposcopy, and both follow-up colposcopy and a cytology sample, in the period up to nine months post-treatment by DHB. Generally, the number of women with both cytology and colposcopy was very similar to the number of women with at least colposcopy (Table 76). The number of women with colposcopy only and no record of a cytology sample in the timeframe was at most three in Bay of Plenty.

Nationally, the percentage of women treated for high-grade lesions with a record of colposcopy and cytology within the nine-month period post-treatment (76.4%) is below the target value of 90%.

One DHB met the target of at least 90% of women receiving cytology and colposcopy within nine months post-treatment (Figure 83, Table 76). The percentage of treated women with a record of both follow-up colposcopy and a cytology sample in the period up to nine months post-treatment varied by DHB from 33.3% (South Canterbury) to all women (Wairarapa).

Women discharged appropriately

In total, 1,021 women (73.3% of those treated) were eligible to be discharged by 12 months after their treatment visit, and 879 of these women (86.1%) were discharged within 12 months of treatment (Table 75). Figure 84 shows how these percentages varied by DHB. The percentage of women eligible for discharge who were discharged within 12 months of treatment ranged from 37.5% (South Canterbury) to all eligible women (Wairarapa and West Coast) (Table 75). In some cases, the number of women eligible for discharge was small, so these results should be interpreted with caution (13 or fewer women in Wairarapa, South Canterbury and West Coast).

Ten DHBs met the target of discharging 90% of women where appropriate within 12 months (Capital & Coast, Counties Manukau, Hawke's Bay, Hutt Valley, Nelson Marlborough, Tairawhiti, Waikato, Wairarapa, West Coast and Whanganui).

In total (that is, without considering whether or not women met the criteria suggested by the NCSP Advisory Group to be eligible for discharge), 1,020 women were discharged within 12 months of being treated for a high-grade lesion (73.3% of all women treated for a high-grade lesion).

Trends	The proportion of women with follow-up has been consistent between the last two reports (from 77.5% for colposcopy for both reports, and from 76.5% to 76.4% for both cytology and colposcopy). One DHB met the target of 90% of women having colposcopy and cytology within nine months of treatment, compared to no DHBs in the previous report. The proportion of women discharged appropriately to their sample taker by 12 months has increased (85.8% in the previous report; 86.1% in the current report). The number of DHBs meeting the target of 90% increased from eight to ten.
Comments	Since this indicator relies on colposcopy data in the NCSP Register, there is the possibility that incomplete reporting of colposcopy visits has led to an underestimate of the number of women with follow-up colposcopy visits and the number discharged in a given time period. The data used in this analysis was extracted from the NCSP Register in late February 2018. The target that 90% or more of women treated for CIN 2 or 3 should be discharged back to the sample taker as appropriate was assessed in this monitoring report, based on guidance from the NCSP Advisory Group as to when discharge would be appropriate. However, it should be noted that neither the 2008 NCSP Guidelines for Cervical Screening in New Zealand nor the 2013 Colposcopy Standards themselves provide explicit guidance for when discharge back to the sample taker is appropriate. In some circumstances, women may be treated within one DHB, but referred to another DHB for follow-up. This information is not always recorded in the NCSP Register, however this measure does take into account all follow-up visits which women attend, regardless of the DHB in which they occurred. For clarity in this report, women remain assigned to the DHB where their treatment was performed.

Figure 83 - Percentage of women treated with colposcopy, and both colposcopy and cytology, within nine months post-treatment, by DHB

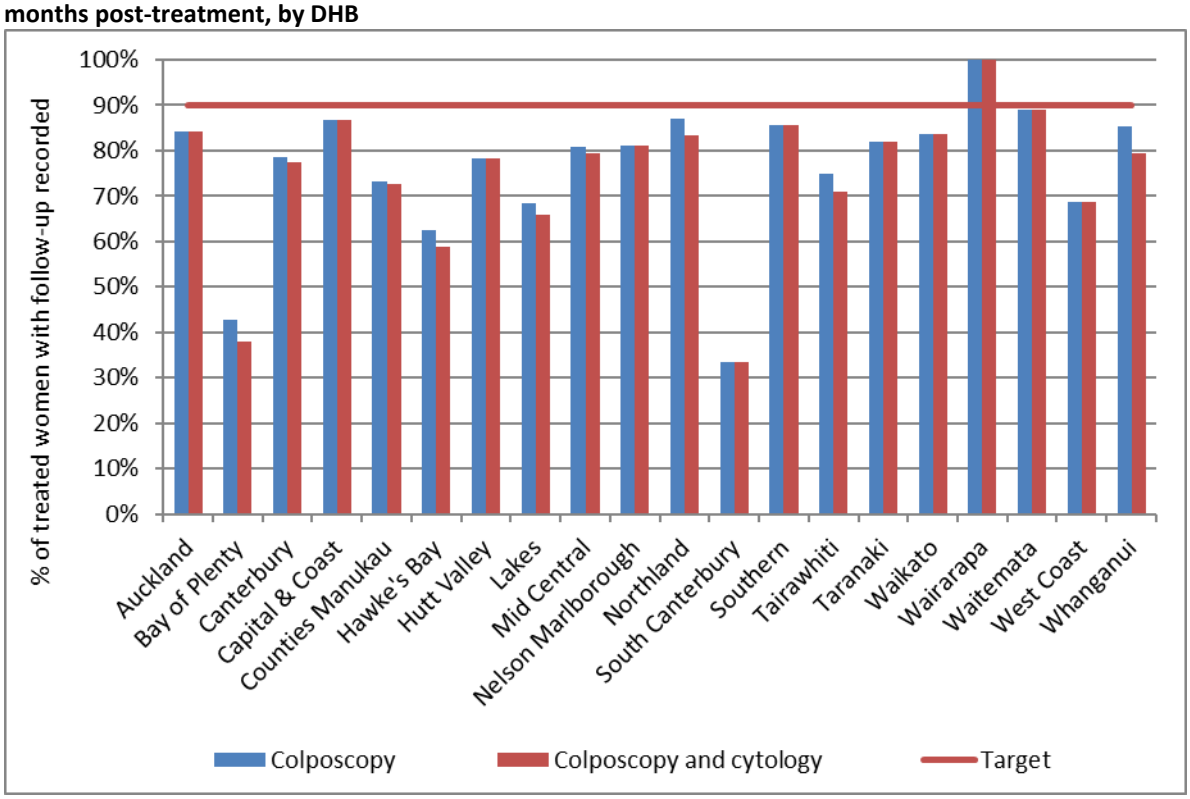
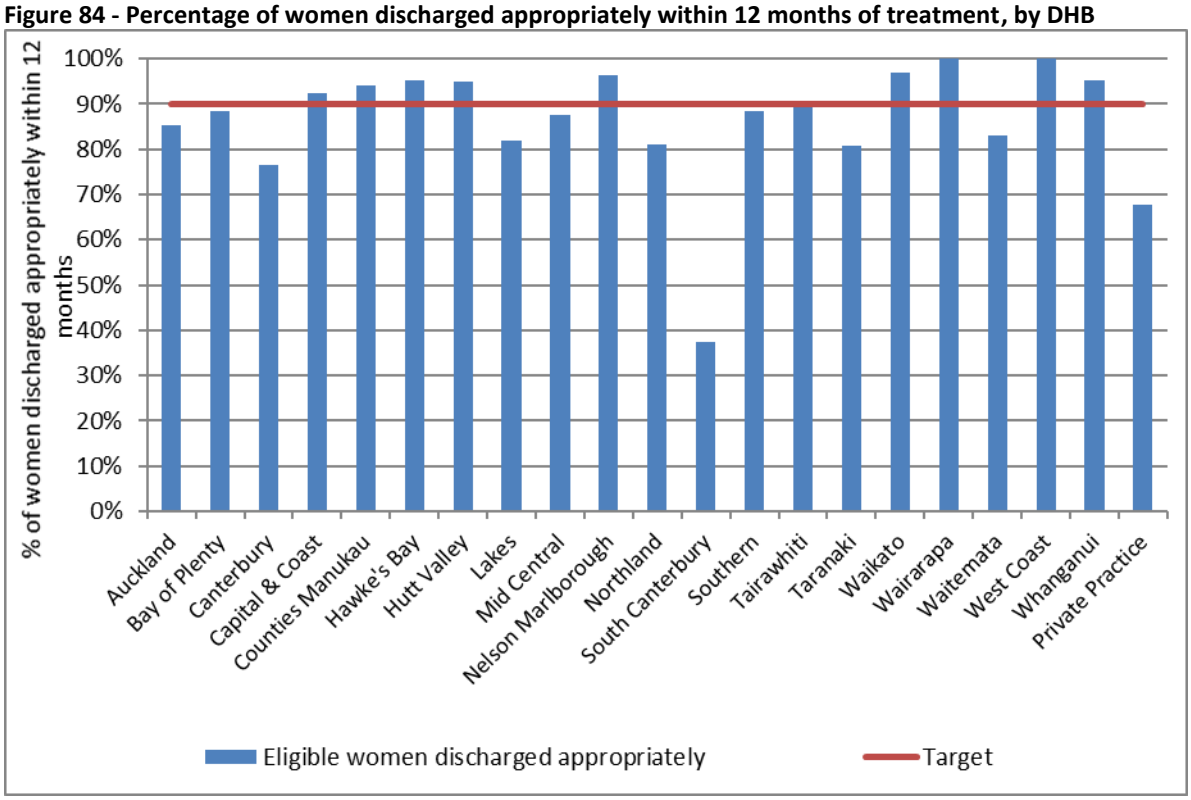


Figure 84 - Percentage of women discharged appropriately within 12 months of treatment, by DHB



Indicator 8 – HPV tests

The indicators report on the use of HPV testing. At present, they incorporate the following indicators:

8.1 Triage of low-grade cytology

8.2 HPV test volumes (including purpose for which the test was performed)

8.3 HPV tests for follow-up of women with a historical high-grade abnormality

Other than HPV test volumes (indicator 8.2) specific monitoring of the other uses of HPV testing is not yet included. These other purposes include:

- Management of women previously treated for CIN
- Management of women with a high-grade squamous cytology result in the past followed by negative cytology
- Resolution of discordant cytology, colposcopy and histology

Indicator 8.1 – Triage of low-grade cytology

Definition	For women with an ASC-US or LSIL (low-grade) cytology result relating to a cervical sample taken in the monitoring period, and with no recent abnormal cytology (i.e. abnormal cytology results relating to specimens taken in the preceding five years), the following are reported on as follows: • The number and proportion of women with a subsequent HPV triage test (by age group, and cytology laboratory) • Women with positive HPV triage result, as a proportion of women with a valid HPV test (by age group, and cytology laboratory) • Histological outcomes in women with a positive triage test, where this information is available within 12 months following a positive HPV triage test Where a woman has two different low-grade cytology results, relating to a sample or samples collected on the same date, she is grouped in accordance with the most serious result (i.e. LSIL). A subsequent HPV triage test is defined as an HPV test where the sample was collected at the same time or after the cytology sample, and where there is a result available (including invalid results). Women whose ASC-US or LSIL cytology test is associated with a recommendation code of R14 (refer regardless of cytology result) are excluded, as they may be symptomatic. Women who are aged less than 30 years are excluded from this indicator if they have ever had either a high-grade squamous cytology result (ASC-H, HSIL) or a high-grade squamous histology result (CIN 2/3), as they may be having an HPV test in order to follow-up a previous high-grade squamous abnormality (cytology or histology, i.e. historical testing or as a test-of-cure following treatment for CIN2/3). If a laboratory which performed the cytology refers the HPV test to a different laboratory, measures are based on the laboratory which performed the cytology test. Measures reported by age are based on the age of the women on the date that the cytology sample was collected.
Target	Targets have not yet been set.
Current Situation	There were 708 women aged less than 30 years and 1,580 women aged 30 years or more with an ASC-US cytology result relating to a sample collected in the current monitoring period, and who had no abnormal cytology results relating to samples taken in the previous five years. The corresponding figures

for LSIL are 2,411 women aged less than 30 years and 1,594 women aged 30 years or more.

HPV triage

NCSP Guidelines (2008) recommend that women aged 30 years or more who have not had an abnormal cytology report in the previous five years are offered a HPV triage test following ASC-US or LSIL cytology. Among these eligible women, 97.3% of women aged 30 years or more with an ASC-US cytology result, and 96.7% of women aged 30 years or more with an LSIL cytology result are recorded as having a subsequent HPV test (Table 77, Table 78). These proportions ranged from 87.1% (Medlab Central Ltd.) to 99.7 (Anatomical Pathology Services) for ASC-US cytology results and from 86.6% (Medlab Central Ltd.) to 99.4% (Pathlab) for LSIL cytology results (Figure 85, Table 77, Table 78).

HPV triage is not included in the recommendations for women aged less than 30 years, and accordingly the proportions of women aged less than 30 years with a subsequent HPV test are very small. Subsequent HPV tests are recorded in the NCSP Register for 1.0% of women aged less than 30 years with ASC-US results (7 women), and 0.6% of women aged less than 30 years with LSIL results (15 women). These proportions ranged from no women (LabPLUS and Pathlab) to 2.9% (Canterbury Health Laboratories) for women with ASC-US results, and from no women (Canterbury Health Laboratories and Medlab Central Ltd.) to 1.0% (LabPLUS and Southern Community Laboratories) for women with LSIL results (Table 77, Table 78).

Positive triage tests

Among women aged 30 years or more with a valid HPV triage test results, the proportion who were positive for high risk HPV (hrHPV) was 24.5% for women with ASC-US results, and 58.5% for women with LSIL results. These proportions varied by laboratory from 13.5% (Canterbury Health Laboratories) to 29.7% (Anatomical Pathology Services) for women with ASC-US cytology (Figure 86), and from 38.5% (LabPLUS) to 67.1% (Canterbury Health Laboratories) for women with LSIL cytology (Figure 87).

The proportion of women whose HPV triage test was positive also varied by age. Among women aged 30-69 years, HPV positivity rates were highest for those aged 30-39 years for women with ASC-US cytology (34.9%), and for those with LSIL cytology (65.1%). HPV positivity rates generally decreased with increasing age, but were broadly similar for women with ASC-US cytology in each of the 10-year age groups between 40 and 69 years. For women with ASC-US results, the positivity rates in the 10-year age groups between 40 and 69 years ranged between 18.6% and 20.3% (Figure 88, Table 21). For women with LSIL results, the positivity rates were between 46.7% and 56.0% for these 10-year age groups (Figure 88, Table 22).

Histological outcomes in triage-positive women who attended colposcopy

In order to allow sufficient time for women to have attended colposcopy following a positive triage test, histological outcomes were assessed in women with low-grade cytology and a positive HPV triage test in the six-month period

1 January – 30 June 2017. In this period, there were 329 women with an ASC-US cytology result and positive HPV triage test, and 796 who had an LSIL cytology result and positive HPV triage test. 314 (95.4%) of the women with ASC-US who were triage-positive and 728 (91.5%) of the women with LSIL who were triage-positive had a record of colposcopy and/or histology within the 12 months following their initial test results. Among the women with a record of colposcopy, 209 (66.6%) and 533 (73.2%) of the women with ASC-US and LSIL respectively have a histology record.

Histological outcomes in these women were initially considered in an analogous manner to Indicator 5.2 – that is, the number of women with CIN 2 or worse histology (CIN 2+; also see Appendix D), as a percentage of women who had a histology result available. The percentage of women with histology whose histology result was CIN 2+ was 23.0% for HPV triage-positive ASC-US and 19.3% for HPV triage-positive LSIL (Table 79, Table 80). These percentages varied by laboratory from 18.5% (Anatomical Pathology Services) to 31.6% (Canterbury Health Laboratories) for HPV triage-positive ASC-US and from 12.1% (Anatomical Pathology Services) to 26.8% (Pathlab) for HPV triage-positive LSIL (Figure 89).

We additionally considered histological outcomes as a percentage of women who attended colposcopy (rather than only those with a histology result), as some women may have no histology because colposcopic impression was normal. The corresponding percentages of women with CIN 2+ histology was 15.3% for HPV triage-positive ASC-US and 14.1% for HPV triage-positive LSIL (Table 79, Table 80). These percentages varied by laboratory from 12.2% (Anatomical Pathology Services) to 26.1% (Canterbury Health Laboratories) for HPV triage-positive ASC-US and from 8.9% (Anatomical Pathology Services) to 17.3% (Pathlab) for HPV triage-positive LSIL (Figure 90). For context, these are also compared with the corresponding percentages for women with ASC-H and HSIL cytology with CIN 2+ histology (among women who attended colposcopy within six months), by laboratory, in Figure 90.

Histological outcomes within 12 months in women with triage-positive test results are shown by age, as a percentage of women with histology recorded (Figure 92), and as a percentage of women with colposcopy recorded (Figure 93). Among women aged 30-69 years, the percentage of women with CIN 2+ histology within 12 months generally decreased with increasing age for HPV triage-positive ASC-US and LSIL. There were no cases of CIN 2+ among women aged 70+ years with ASC-US or LSIL and a positive HPV triage test. The age group with the highest proportion of triage positive women with CIN2+ histology was 30-39 years for both ASC-US and LSIL (33.0% and 24.3%, respectively).

Trends

HPV triage

The proportion of women aged 30 years or more with low-grade cytology (and no recent abnormal cytology in the preceding five years) who received a subsequent HPV test is similar to the previous report for women with ASC-US results (97.4% in the previous period compared to 97.3% in the current period),

but decreased for women with LSIL results (97.6% in the previous period compared to 96.7% in the current period). The proportion of women aged less than 30 years with a subsequent HPV test is slightly lower than the previous monitoring period for ASC-US results (1.8% in the previous period compared to 1.0% in the current period for ASC-US) and similar to the previous period for LSIL results (0.7% in the previous period and 0.6% in the current period for LSIL).

Positive triage tests

The proportion of women aged 30 years or more who tested positive for a high-risk HPV type is lower in the current report for both ASC-US (25.5% in the previous report; 24.5% in the current report), and LSIL (60.1% in the previous report; 58.5% in the current report).

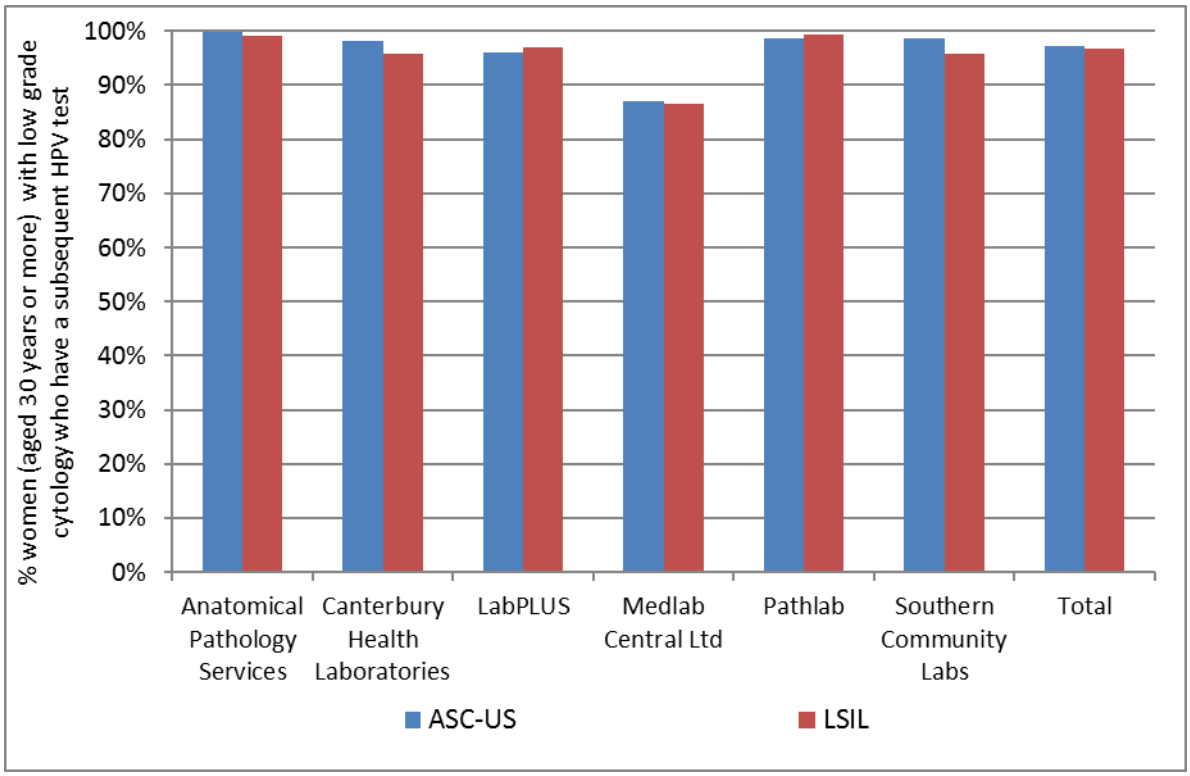
Histological outcomes in triage-positive women who attended colposcopy

95.4% of women with ASC-US cytology and a positive HPV triage test in the six-month reference period for the current report had a record of colposcopy and/or histology within the 12 months following their test result, which has increased since the previous report (91.1%). For the current report, 66.6% of these women with colposcopy also had a histology record, which is similar to the previous report (66.6%). Of these women with a histology record, the histology result was CIN 2+ for 23.0% of women in the current report, compared with 26.9% in the previous report. When histological CIN 2+ outcomes were considered as a proportion of women with colposcopy, rather than histology, the corresponding figures were 15.3% in the current report versus 17.9% in the previous report. The proportion of triage-positive ASC-US women with CIN 2+ histology (among those who attended colposcopy) also decreased compared to the previous report at four of the six laboratories (LabPLUS, Medlab Central Ltd., Pathlab and Southern Community Laboratories; Figure 94). Caution must be taken when interpreting differences at LabPLUS due to frequently having small numbers of triage-positive women and therefore highly variable percentages).

For women with LSIL cytology and a positive HPV triage test in the reference period for the current report, 91.5% had a record of colposcopy and/ or histology within 12 months of their result, which is lower than the 93.5% of women in the previous report. For the current report 73.2% of these women with colposcopy also had a histology record, compared with 71.8% in the previous report. Of those women with a histology record, the histology result was CIN 2+ for 19.3% of women in the current report, compared with 21.2% in the previous report. When histological CIN 2+ outcomes were considered as a proportion of women with colposcopy, rather than histology, the corresponding figures were 14.1% for the current report and 15.2% for the previous report. Trends in this proportion of LSIL triage-positive women with CIN 2+ histology (among those who attended colposcopy) are shown in Figure 95. The proportion with CIN2+ histology decreased in four laboratories (Anatomical Pathology Services, Canterbury Health Laboratories, LabPLUS and Medlab Central Ltd).

Comments	A small number of women aged less than 30 years with low-grade results, no recent abnormalities (in the previous five years) and no record at any time of a previous high-grade squamous abnormality (cytological or histological), have a record of a subsequent HPV test (22 women). This is lower than the number of women in the previous report (27 women). It is uncertain whether these HPV tests were performed for the purpose of triage, or for other reasons. In this report, we excluded women aged less than 30 years from this indicator if they had ever had a previous high-grade squamous abnormality (either ASC-H/ HSIL cytology, or CIN 2/3 histology). This was done in order to avoid potential inadvertent inclusion in this group of women being tested for HPV in concordance with the guidelines as part of "historical testing". This could occur as a result of a previous high-grade squamous abnormality (either ASC-H/ HSIL cytology, or CIN 2/3 histology) currently managed by annual cytology, which occurred more than five years earlier (since abnormalities within the previous five years are already taken into account). It is also possible that some women were aged 29 years at the time of their cytology sample, but 30 years at the time of the cytology result, although previous exploration has suggested that the extent of this is likely to be small.[22, 23] Another possible explanation is that these women are being followed up for a previous high-grade result but this is not recorded on the NCSP Register (for example because this occurred overseas). The HPV test may also have been ordered by a specialist. However note that inadvertent inclusion of HPV tests ordered by a specialist to resolve discordant results (or for historical testing) should be minimised since women were excluded from this indicator if they had any recent abnormalities (past five years, any abnormality grade); if they had ever had a high-grade squamous abnormality (but no glandular abnormality) recorded on the NCSP Register; if the sample for HPV testing was collected on the same day as a recorded colposcopy visit for that woman; or if the sample for HPV testing was collected more than five weeks after the cytology sample.

Figure 85 - Proportion of women (aged 30 years or more) with low-grade cytology who have a subsequent HPV test, by laboratory and cytology result



Excludes women with abnormal cytology in the five years preceding their low -grade cytology sample.

Figure 86 - Proportion of HPV triage tests which are positive following ASC-US cytology (women aged 30 years or more), by cytology laboratory

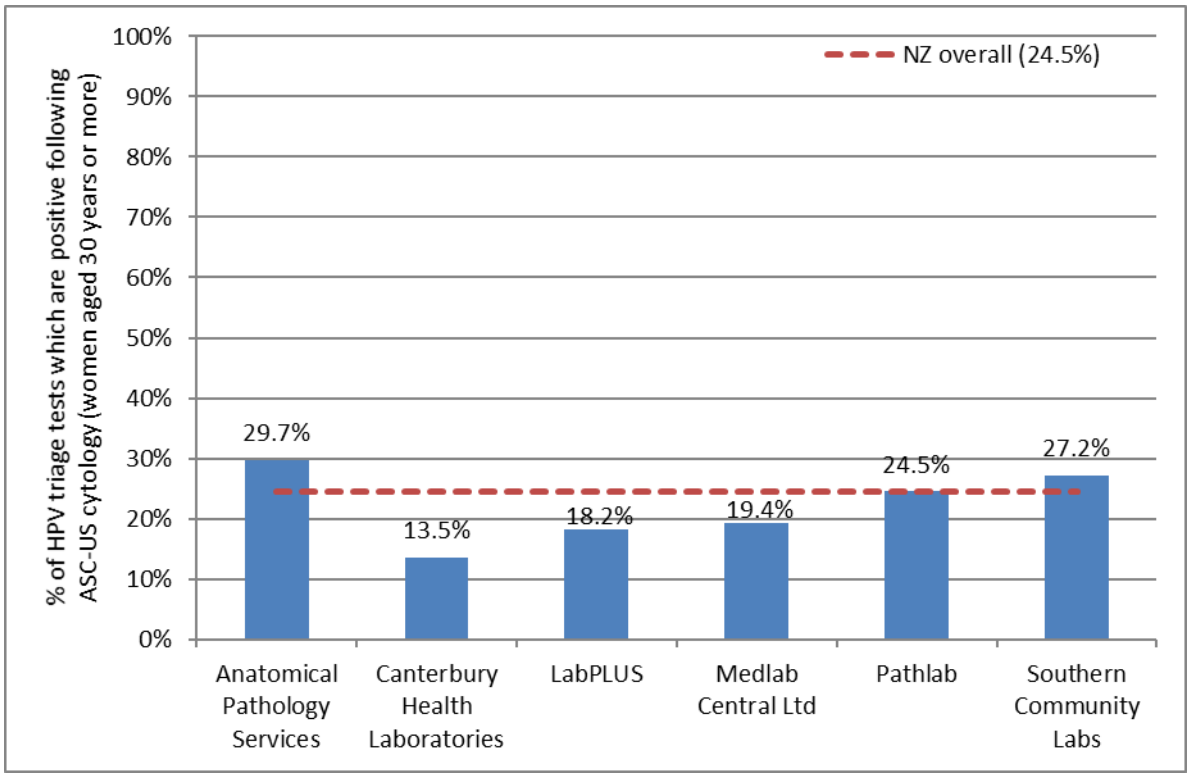


Figure 87 - Proportion of HPV triage tests which are positive following LSIL cytology (women aged 30 years or more), by cytology laboratory

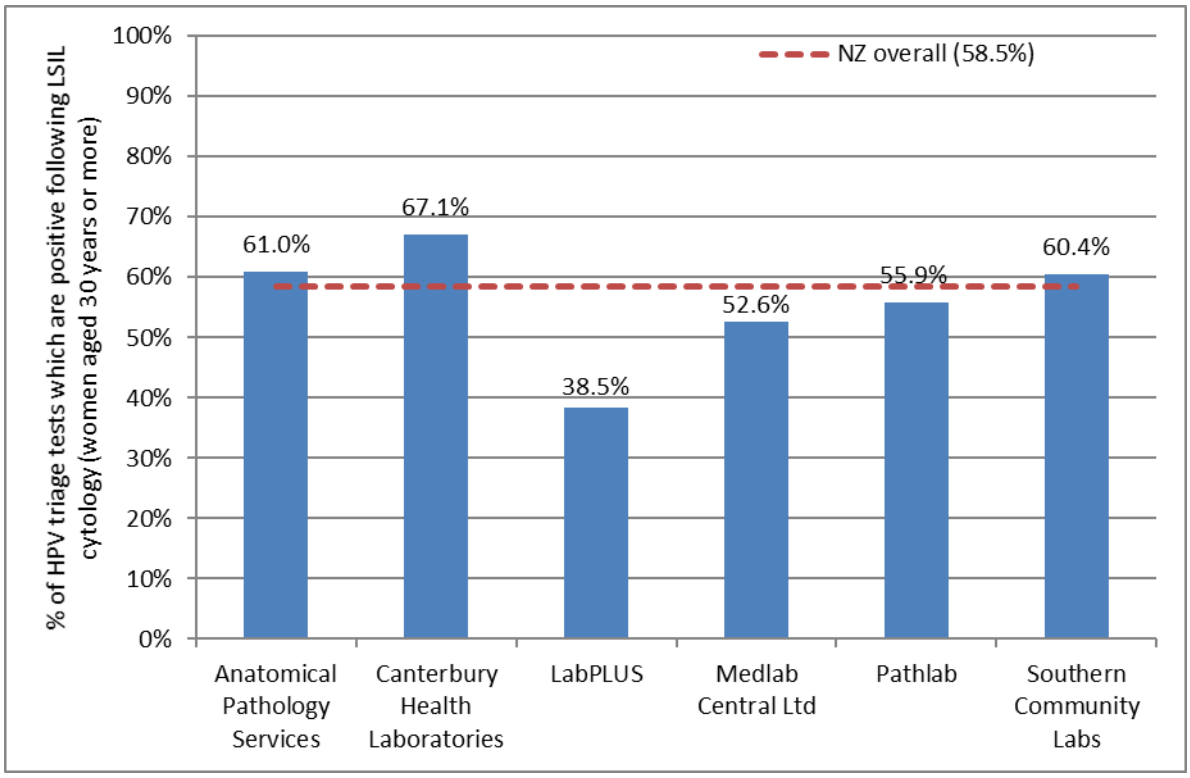
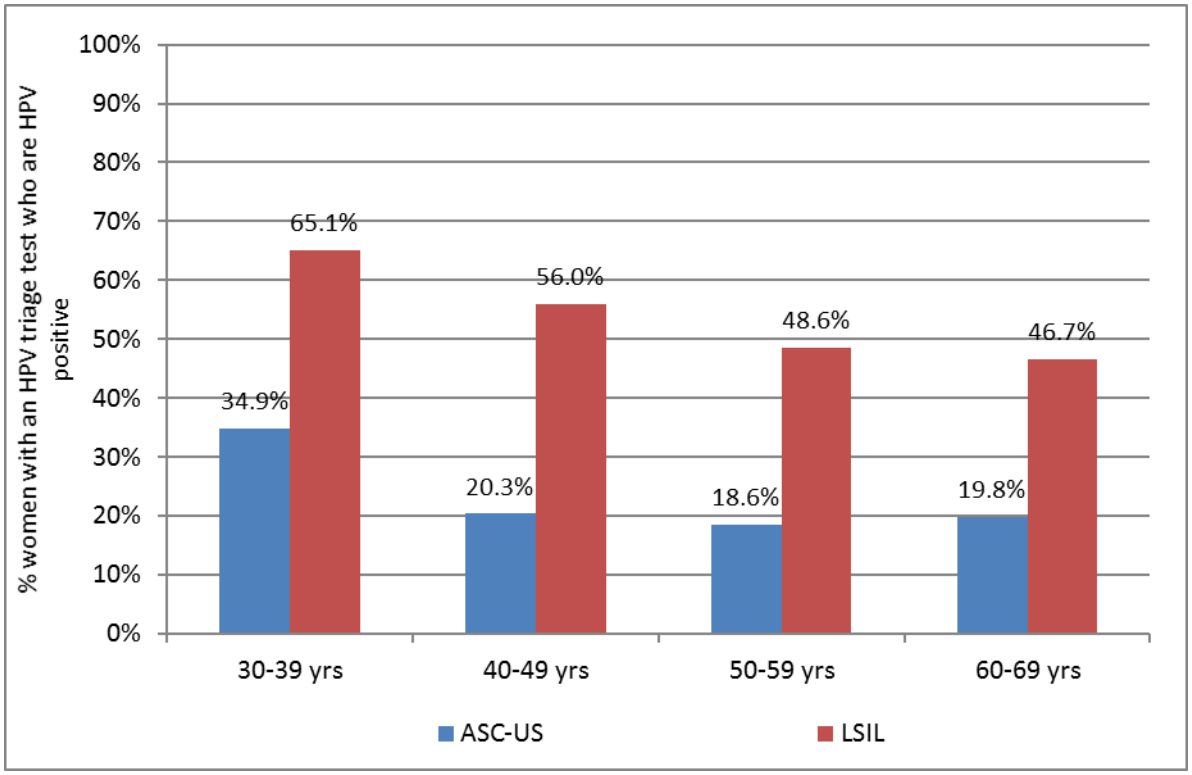


Figure 88 - Proportion of women with an HPV triage test who are HPV positive, by age and cytology result



Note: Excludes results for women aged less than 30 years and aged 70 years or more, since these are based on very small numbers of women with valid HPV test results.

Table 21 - HPV triage test results following ASC-US cytology, by age and cytology laboratory

Laboratory	Women with valid HPV test results		Women with positive HPV test results (number and % within each age group)											
	<30yrs*	30+ yrs	< 30yrs*		30-39 yrs		40-49 yrs		50-59 yrs		60-69 yrs		70+ yrs	
	N	N	N	%	N	%	N	%	N	%	N	%	N	%
Anatomical Pathology Services	4	354	3	75.0	55	44.7	24	23.3	18	20.2	7	21.2	1	16.7
Canterbury Health Laboratories	1	111	0	0.0	6	15.0	8	20.0	1	5.3	0	0.0	0	0.0
LabPLUS	0	170	0	0.0	11	25.6	11	18.6	8	18.6	1	4.2	0	0.0
Medlab Central Ltd.	1	155	0	0.0	17	29.3	7	16.3	5	13.2	1	6.7	0	0.0
Pathlab	0	294	0	0.0	30	33.3	18	19.6	10	16.4	13	28.3	1	20.0
Southern Community Laboratories	1	452	0	0.0	55	37.9	30	20.7	25	22.5	13	27.1	0	0.0
Total	**7**	**1536**	**3**	**42.9**	**174**	**34.9**	**98**	**20.3**	**67**	**18.6**	**35**	**19.8**	**2**	**11.8**

Excludes women with abnormal cytology in the five years preceding their low -grade cytology sample.

** Additionally excludes women with any previous squamous high -grade (cytology or histology)*

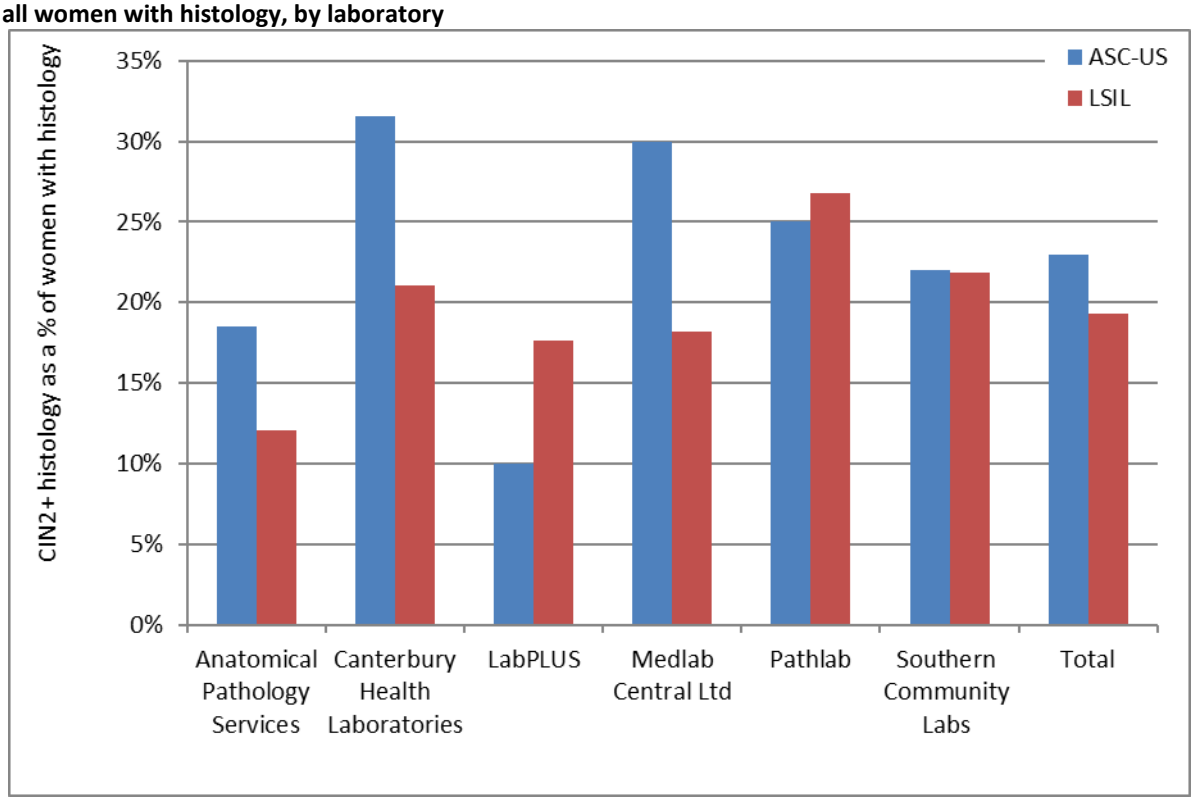
Table 22 - HPV triage test results following LSIL cytology, by age and cytology laboratory

Laboratory	Women with valid HPV test results		Women with positive HPV test results (number and % within each age group)											
	< 30yrs*	30+ yrs	< 30yrs*		30-39 yrs		40-49 yrs		50-59 yrs		60-69 yrs		70+ yrs	
	N	N	N	%	N	%	N	%	N	%	N	%	N	%
Anatomical Pathology Services	2	369	0	0.0	124	67.0	64	59.8	30	52.6	7	35.0	0	0.0
Canterbury Health Laboratories	0	70	-	-	28	75.7	12	66.7	5	38.5	2	100.0	0	0.0
LabPLUS	1	65	0	0.0	14	51.9	9	37.5	1	11.1	1	20.0	0	0.0
Medlab Central Ltd.	0	97	-	-	23	59.0	14	50.0	8	40.0	6	60.0	0	0.0
Pathlab	1	313	1	100.0	78	61.4	61	51.7	25	56.8	8	42.1	3	60.0
Southern Community Laboratories	11	627	9	81.8	204	66.0	102	59.0	52	49.1	18	52.9	3	60.0
Total	**15**	**1541**	**10**	**66.7**	**471**	**65.1**	**262**	**56.0**	**121**	**48.6**	**42**	**46.7**	**6**	**60.0**

Excludes women with abnormal cytology in the five years preceding their low -grade cytology sample

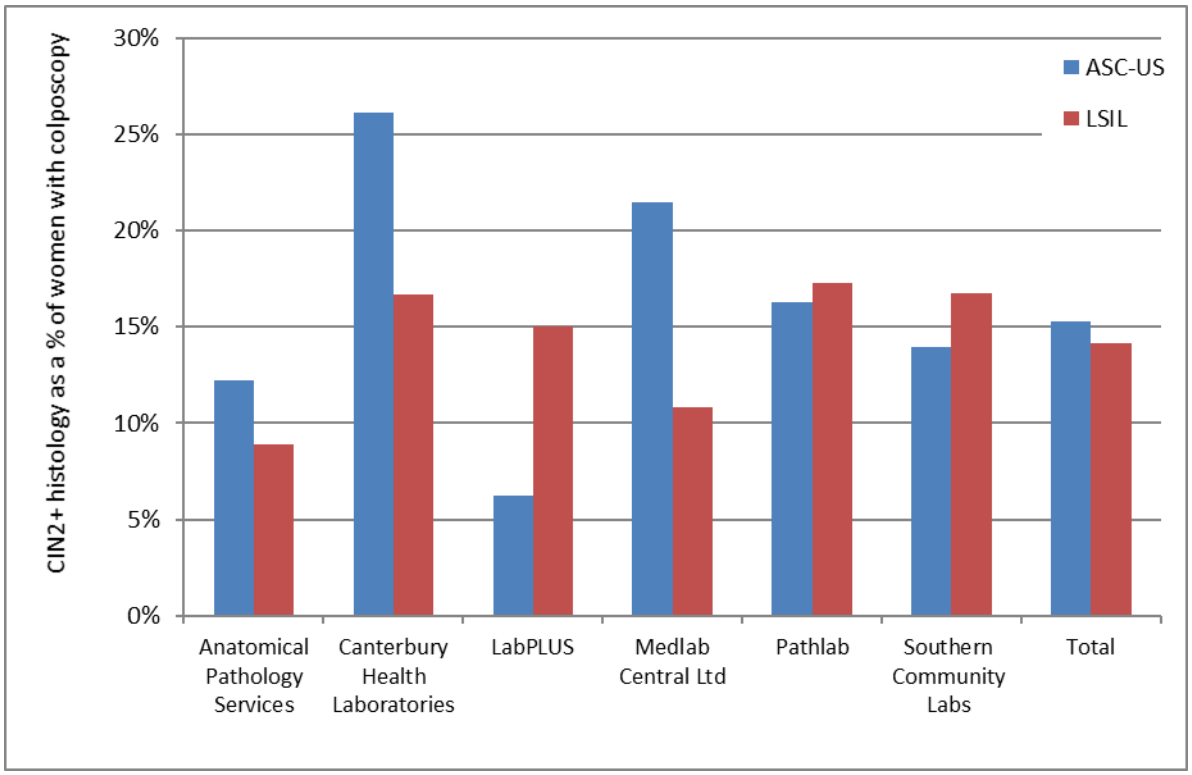
** Additionally excludes women with any previous squamous high -grade (cytology or histology)*

Figure 89 – Triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of all women with histology, by laboratory



Note that LabPLUS results are based in very small numbers of triage-positive women (see Table 79 and Table 80).

Figure 90 – Triage-positive *women with histologically-confirmed* CIN 2+ within 12 months, as a percentage of all women who attended colposcopy, by laboratory



Note that LabPLUS results are based in very small numbers of triage-positive women (see Table 79 and Table 80).

Figure 91 - Women with histologically-confirmed CIN 2+ within 12 months, as a percentage of all women who attended colposcopy, by laboratory and referral cytology

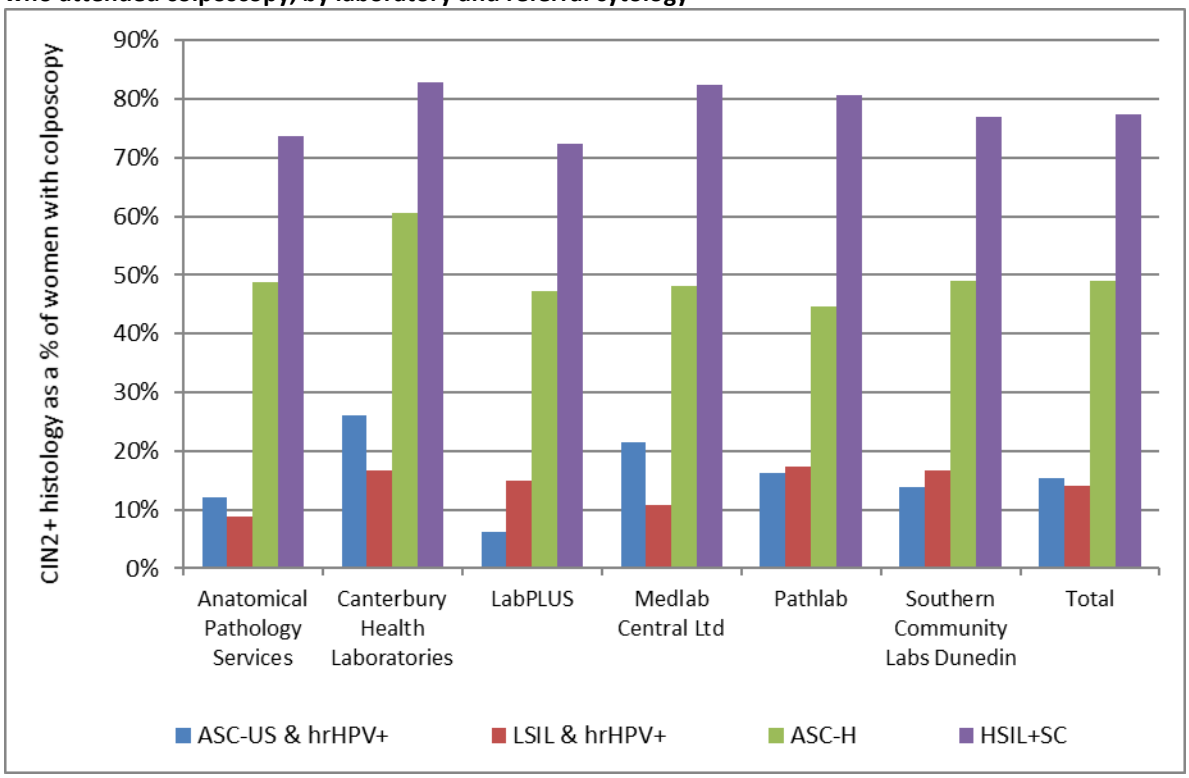


Figure 92 – Triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with histology recorded, by age

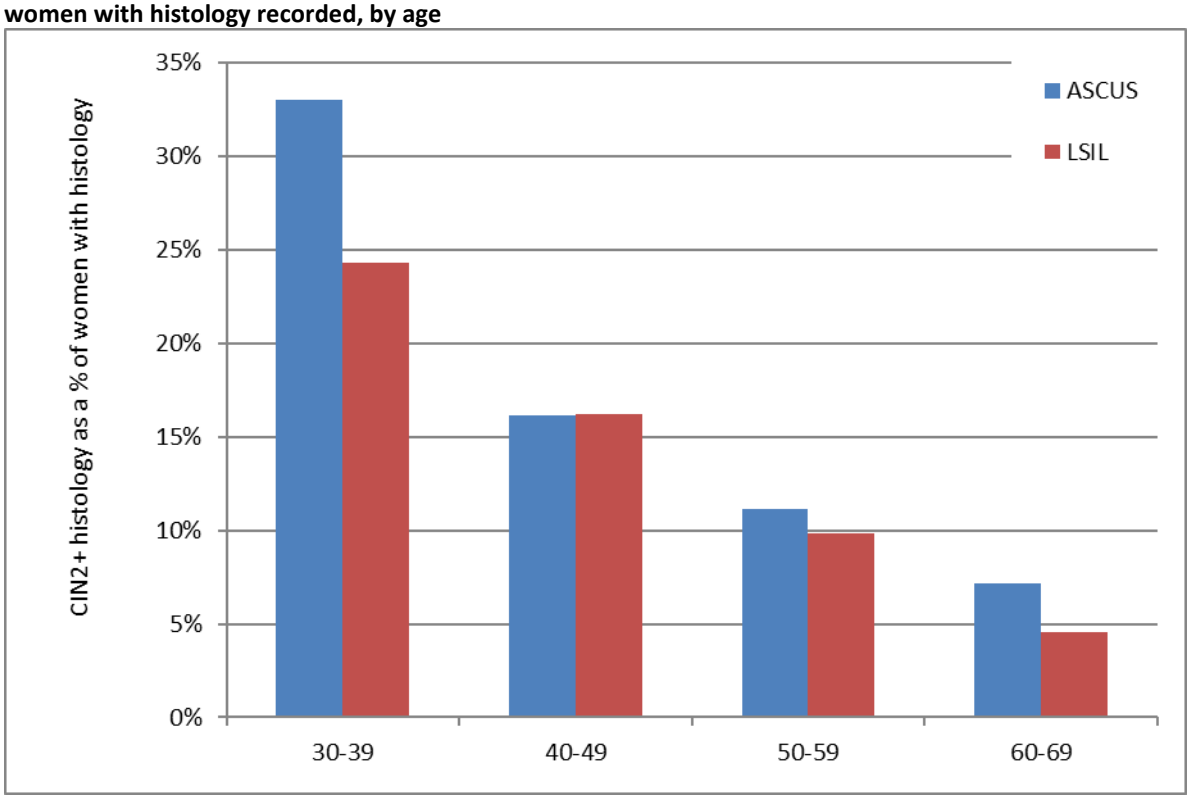


Figure 93 – Triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with colposcopy recorded, by age

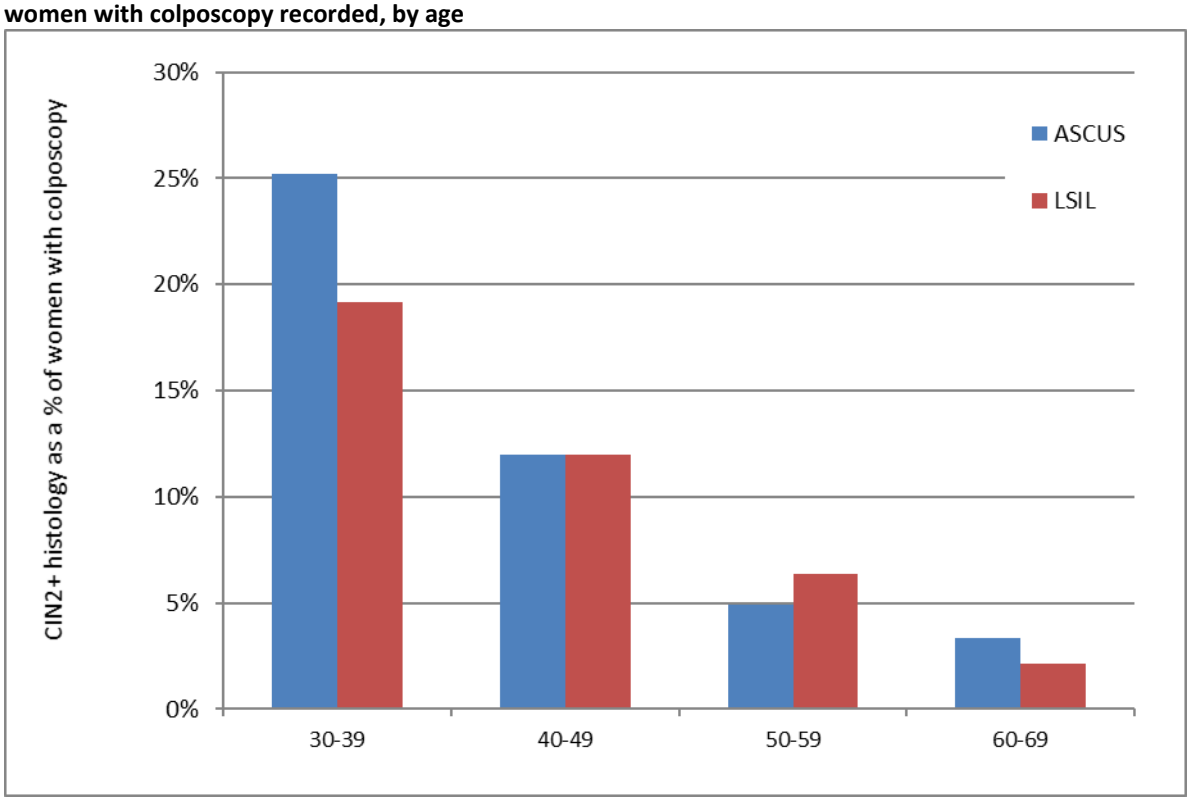
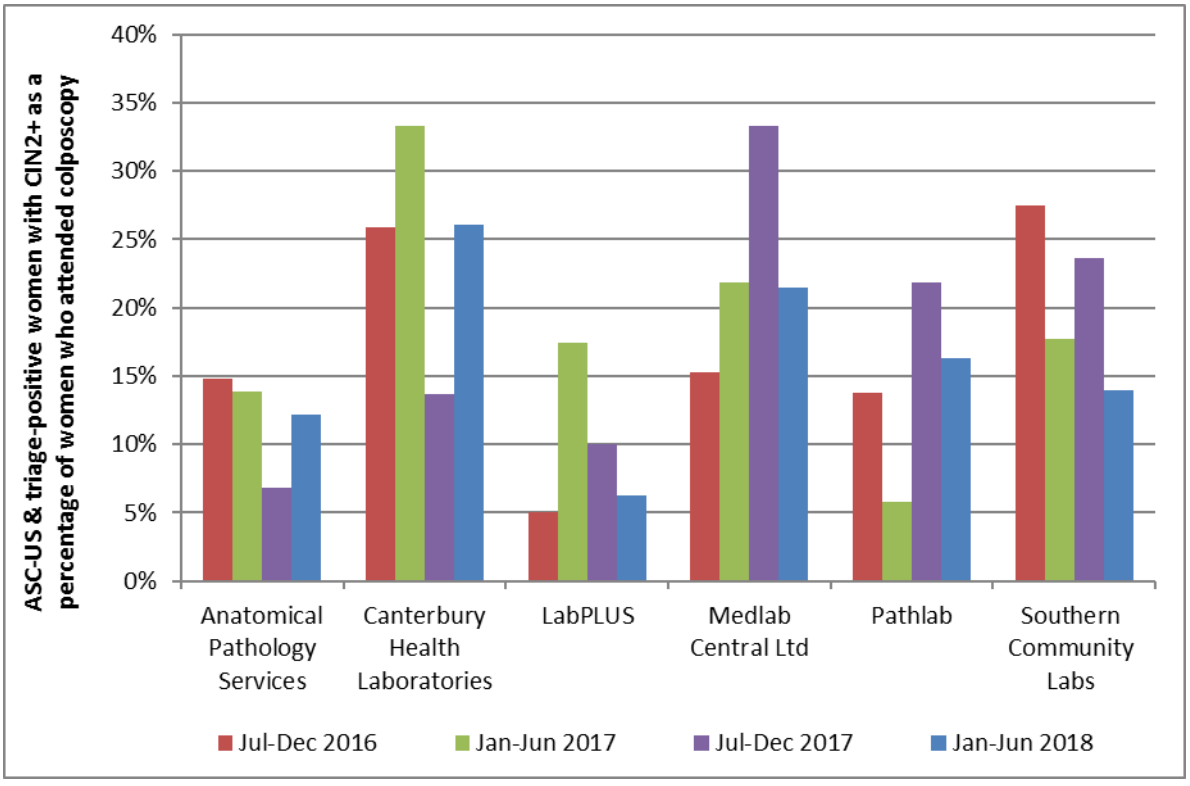
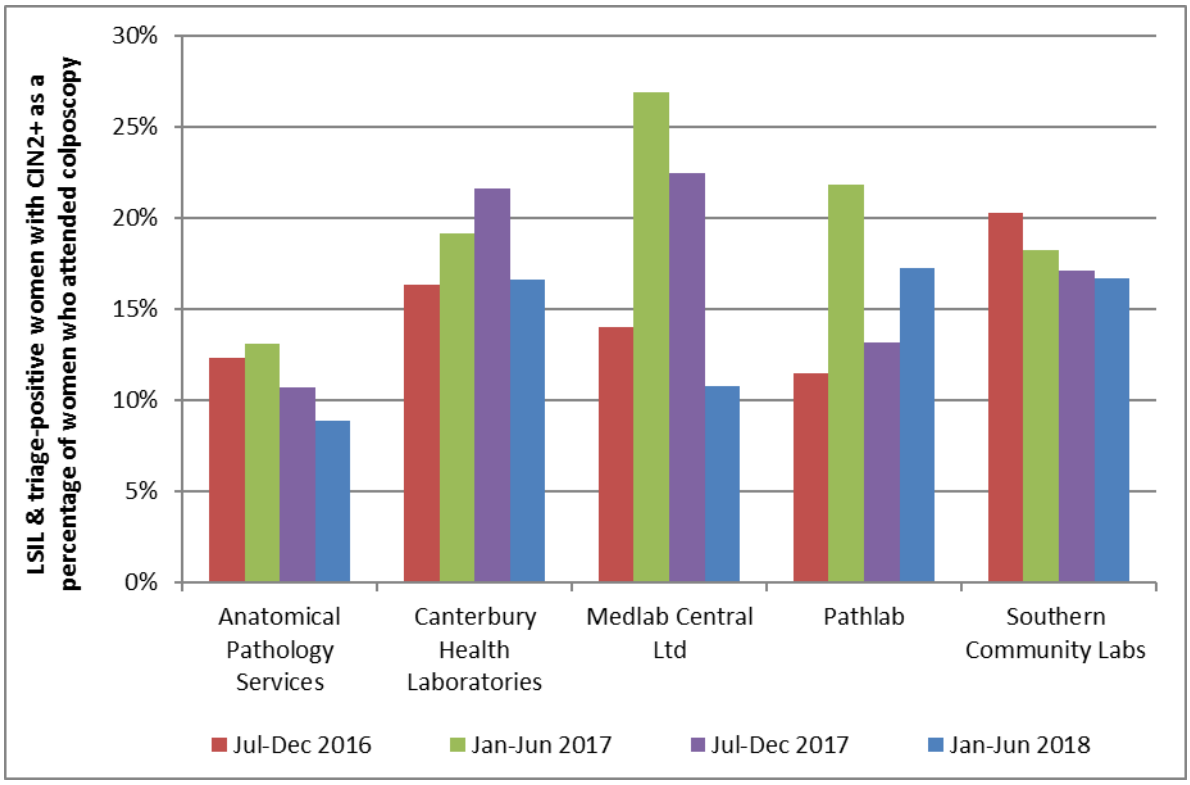


Figure 94 – Trends in ASC-US triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with colposcopy recorded, by laboratory



Time periods relate to monitoring report periods; results relate to samples collected in the 6-month period 12 months prior to the monitoring period, to allow for sufficient follow-up time for colposcopy/ histology. See Table 79.

Figure 95 – Trends in LSIL triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with colposcopy recorded, by laboratory



Time periods relate to monitoring report periods; results relate to samples collected in the 6-month period 12 months prior to the monitoring period, to allow for sufficient follow-up time for colposcopy/ histology. Note that this graph excludes LabPLUS due to frequently having small numbers of triage-positive women and highly variable percentages. See Table 80.

Indicator 8.2 – HPV test volumes

Definition

All HPV tests received by laboratories within the monitoring period were retrieved. This volume of HPV tests (performed for any purpose) is reported on by:

- Laboratory
- Ethnicity
- Age group
- Purpose

Purpose is defined as one of the following categories:

i) Post-treatment *(women treated for high-grade squamous lesions (specifically CIN 2/3) in the period six months to four years prior to the HPV sample date, to capture two rounds of testing)*

ii) Historical *(high-grade squamous cytology (ASC-H/ HSIL) or histology (CIN 2/3) more than three years prior to the HPV test sample)*

iii) Taken at colposcopy (*HPV sample collected on the same date as a colposcopy visit or a histology sample in the same woman)*

iv) HPV triage *(as defined in Indicator 8.1, but restricted to women aged 30 years or more at the time of the cytology specimen, and where the low -grade cytology (ASC-US or LSIL) was no more than six months prior to the HPV test)*

v) Other *(tests which do not fit into any of the above categories)*

These categories are defined hierarchically in the order shown; that is, a test cannot fit into more than one category, and tests are only considered for inclusion in a category if no previous categories in the list apply. The purpose of tests is not at its final stage of development and is an item that is under ongoing review.

Tests in the 'Other' category were explored further. The number of tests that fell into the 'Other' category was found to be relatively high in this report, but this analysis is nonetheless indicative of the appropriate purposes. It is also useful to report the extent of hrHPV tests for other purposes and the need to eliminate hrHPV tests for other purposes that are not within the NCSP guidelines. For this reason, the purpose of hrHPV tests are discussed in this report.

Rates of invalid HPV tests are also reported on.

Measures reported by age are based on the age of the women on the date that the HPV test sample was collected.

Target

Targets have not yet been set.

Current Situation

Overall volumes

There were 18,302 samples received by laboratories for HPV testing within the current monitoring period. These are reported on further in Table 81 to Table 87.

Virtually all (98.3%) samples for HPV testing were from women aged 20-69 years. The large majority of women (86.0%) were aged 30 years or more (Figure 96, Table 85).

The number of samples received by laboratories for HPV testing ranged from 798 (LabPLUS; 4.4% of all HPV tests) to 7,915 (Southern Community Laboratories; 43.2% of all HPV tests) (Figure 97, Table 81). Figure 98 and Table 81 show for each laboratory the ratio of the number of HPV tests received, divided by the number of cytology tests received (expressed as a percentage). This measure provides some correction for the variation in workloads between different laboratories. It is likely, for example, that laboratories which process a larger volume of cytology tests would also undertake a larger volume of HPV tests. The ratio of HPV tests to cytology tests reported was on average 8.4% across New Zealand – that is, on average 8.4% of cytology tests are associated with an HPV test. This ratio varied by laboratory from 7.2% (Southern Community Labs; i.e. fewer HPV tests processed in relation to cytology tests processed than the national average) to 12.6% (Canterbury Health Laboratories; i.e. more HPV tests processed in relation to cytology tests processed than the national average).

The distribution of HPV tests by ethnicity is shown in Table 84.

The overall proportion of HPV tests with invalid results was 0.07% (Table 82). The proportion was small for the HPV test technologies reported (Table 83).

Purpose of HPV tests

These HPV tests were further analysed in order to ascertain the purpose for which they were performed. Nationally, it was calculated that 2,694 (14.7%) were for post-treatment management for women treated in the past four years; 6,701 (36.6%) were for follow-up management of women with high-grade squamous cytology or histology more than three years previously (historical testing); 1,388 (7.6%) were on samples collected at a colposcopy visit which did not fit into a previous category (possibly for resolution of discordant results); and 2,878 (15.7%) were for triage of low-grade cytology in women aged 30 years or more. There were 4,641 (25.4%) HPV tests that did not fit into any of the previously described categories, identified as Other (Figure 99).

Further breakdowns of HPV tests by purpose are presented by age (Figure 100, Table 85), laboratory (Figure 101), and ethnicity (Table 84, Table 86).

There were variations in HPV test purpose by age (Figure 100, Table 85). HPV triage (by the definition used here, and consistent with NCSP Guidelines) did not occur in women aged less than 30 years. In women aged less than 30 years, a comparatively larger proportion were taken for post-treatment management

(31.0%). Follow up of women with historical high-grade squamous abnormalities (more than three years ago) was the most common reason that HPV tests were performed among women in the five-year age groups between 30 and 54 years. Tests which did not fit into the prescribed categories, and were therefore classified as 'Other', were the most common classification among women aged 20-24 years and in the five-year age groups aged 55 years and older. Having an equal proportion, the most common reason for a HPV test for women aged <20 was at colposcopy and for 'Other' tests (although based on a very small number of HPV tests in women this age).

HPV test purpose also varied by laboratory (Figure 101, Table 86). Among tests for which the purpose could be determined, the most common reason for HPV testing was historical testing in five of the six laboratories (Anatomical Pathology Services, Canterbury Health Laboratories, Medlab Central Ltd., Pathlab and Southern Community Laboratories). HPV triage was the most common HPV test reason for LabPLUS. In all laboratories, however, tests for which the purpose was unclear were quite common, varying from 13.4% at LabPLUS to 33.1% Southern Community Laboratories. The proportion of tests performed for post-treatment management varied from 11.9% (Pathlab) to 24.9% (Canterbury Health Laboratories), while the proportion performed to follow up women with historical high-grade squamous abnormalities varied from 20.8% (LabPLUS) to 43.1% (Anatomical Pathology Services). The proportion of tests where the sample was collected at colposcopy but not for one of the previous purposes ranged from 2.7% (Anatomical Pathology Services) to 22.9% (LabPLUS). The proportion of tests performed for HPV triage ranged from 12.5% (Southern Community Labs) to 28.2% (LabPLUS).

Follow up of women with historical high-grade squamous abnormalities (more than three years ago) was the most common reason that HPV tests were performed among Māori, Pacific and European/ Other women. HPV triage was the most common reason for HPV tests in Asian women (Table 84).

Tests in the 'Other' category were further explored. A proportion of the 'Other' tests (2.6%; 120 tests) were potentially tests performed for post-treatment management, because the same woman had CIN 2/3 histology recorded on the NCSP Register, however there was no explicit record of treatment available on the NCSP Register, potentially due to incomplete colposcopy data on the NCSP Register. Another 5.0% occurred after treatment, but did not meet the criteria for post-treatment management because they occurred within 6 months of treatment (0.9%; 42 tests), or after treatment of a non-squamous high-grade (1.1%; 51 tests), or a non-high-grade (2.9%; 134 tests) or cervical cancer (0.13%; 6 tests). A further 18.0% of the 'Other' HPV tests occurred after a previous abnormality but one which did not meet the criteria for historical testing either because it was non-squamous (9.5%; 443 tests), the high-grade squamous cytology was less than three years ago (8.3%; 385 tests), or the histology diagnosis was cervical cancer (0.2%; 7 tests).

A larger proportion of the 'Other' tests (26.6%; 1,236 tests) occurred in women who did not have any specific high-grade abnormality recorded on the NCSP Register, but who did have a record on the NCSP Register suggesting that they

had a previous high-grade abnormality (although the Register does not record whether it was a squamous abnormality or not; consequently, HPV testing is not indicated in these women by the NCSP guidelines). These records predominantly indicated prior high-grade cytology (22.2%; 1,030 tests), but some suggested prior high-grade histology (4.4%; 206 tests). Smaller proportions of HPV tests were associated with a low-grade abnormality, including either a current low-grade cytology result which did not meet the criteria for triage because the woman had another recent abnormality and triage was not required (2.1%; 99 tests), a record suggesting a previous low-grade cytology not explicitly recorded on the NCSP Register (3.0%; 137 tests), or collected by a specialist where none of the other reasons applied (5.5%; 255 tests). After this exploration, there remained 1,726 tests (37.2% of 'Other' tests; 9.4% of all HPV tests in the monitoring period) where purpose still could not be determined.

HPV tests at colposcopy

HPV tests taken at colposcopy, were further explored based on the DHB of the colposcopy clinic where the sample was taken and whether or not it was a public or a private clinic. This included only HPV tests where a colposcopy record exists and not those inferred by a histology result. Nationally, more of the HPV tests that were taken at colposcopy came from public facilities (86.1%; 1,009 tests) than from private facilities (13.9%; 163 tests). As the number of HPV tests collected at a colposcopy clinic is potentially reflective of the number of colposcopies performed there, a rate of HPV tests at colposcopy which takes this variation into account was derived, in order to provide more information. The rate of HPV tests at colposcopy was calculated by dividing the number of HPV tests collected at colposcopy by the total number of colposcopies within that DHB or across private colposcopy clinics, expressed as a percentage. This rate can be broadly interpreted as the percentage of colposcopies (within a given DHB or sector) where an HPV test sample is collected. Across New Zealand, HPV test samples were collected in approximately 9.6% of colposcopies. In DHBs where HPV tests were collected at colposcopy, this value ranged from 2.3% (Auckland) to 30.4% (Lakes), and was 9.4% overall across all public DHB clinics (Figure 102, Table 87). In private practice, this rate was 11.6%. No HPV test samples were collected in the Tairawhiti DHB clinic.

Trends

A similar volume of HPV samples was received at laboratories for testing in the current (18,302) and the previous monitoring period (18,230; an increase of 0.4%). Three laboratories experienced an increase in the number of samples received between the current monitoring period compared with the previous report period. The laboratory with the largest percentage increase in the number of tests between the previous and current period was Southern Community Laboratories (from 7,380 to 7,915 tests; 7.2% increase) and the largest decrease was at LabPLUS (from 915 to 798 tests; 12.8% decrease) and Medlab Central Ltd. (from 1,816 to 1,588 tests; 12.6% decrease). Trends by laboratory can be seen in Figure 103.

Changes in HPV test volumes varied across all test purpose categories. The greatest increase in the number of tests performed for the four guidelines

categories (post-treatment, historical testing, HPV triage or tests at colposcopy) occurred at colposcopy (9.8% increase; 124 tests) and the only relative decrease was seen in HPV tests taken for historical reasons (decrease of 1.0% or 68 tests) (Figure 104). A decrease was also seen in both the number of HPV tests in the 'Other' category (310 tests) and also the percent of all HPV tests in this category (from 27.2% to 25.4%). The proportion of tests in each of the other four categories was broadly similar to that seen in the previous report (from 14.1% to 14.7% for post-treatment management; from 37.1% to 36.6% for historical testing; and from 6.9% to 7.6% for tests taken at colposcopy; and increased from 14.7% to 15.7% for triage of low-grade cytology,).

The proportion of colposcopies where an HPV test sample was collected increased somewhat in this report (from 8.9% to 9.6%). DHBs where this proportion is higher are generally the same as in previous reports, although the proportion has been increasing over the previous three reports in South Canterbury, and also across private practice overall (Figure 105).

The proportion of HPV tests which are invalid remains very small (Table 83).

Comments

HPV volumes by laboratory will vary for a number of reasons, one of which being the general volume of work in that laboratory. In order to provide some correction for the variation in workloads between different laboratories, we calculated the ratio of HPV tests received to cytology tests reported on (Figure 98, Table 81). Other reasons for variations in the rate of HPV testing by laboratory (which are not taken into account in this ratio) may include differences in the population they serve, because HPV testing is performed in specific subgroups of women. For example, HPV triage testing is performed in women with low-grade (ASC-US/ LSIL) cytology results (but without recent abnormalities), therefore laboratories reporting higher rates of low-grade abnormalities may also have higher rates of triage testing. Conversely, laboratories reporting on a larger proportion of cytology from colposcopy clinics may be more likely to perform HPV tests arising from colposcopy (for example LabPLUS) but less likely to perform HPV triage testing, because women attending colposcopy have generally had a recent abnormality and therefore do not require triage. These issues may for example partly explain differences in the ratios between different Laboratories. To understand in more detail, the reasons for the differences, an explicit exploration of the purpose for which the HPV test was performed has been examined here.

Exploration is ongoing into the potential reason for tests in the 'Other' category, as is the refinement of specifications for the analysis of purpose. Some possible explanations include follow-up of women previously treated for high-grade squamous abnormalities where these abnormalities occurred outside New Zealand, prior to the woman being enrolled on the NCSP Register, or prior to the inception of the NCSP Register. The latter may potentially explain why the proportion of 'Other' tests is higher in older women than in younger women (except for women aged 20-24). Synopses held on the NCSP Register of previous (self-reported) high-grade abnormalities have been used in this report to explore this possibility further (although these synopses do not distinguish

between squamous abnormalities and glandular abnormalities; HPV testing is currently only recommended for the management of women with previous squamous abnormalities). The proportion associated with a synopsis reflecting a previous high-grade abnormality (cytological or historical) reported here (26.6%) is slightly less than that in the previous report (29.7%), and the number of tests in this category has also decreased since the previous report (from 1,470 to 1,236). In a June 2015 newsletter, the NCSP reminded laboratories that women with a previous glandular lesion, or a high-grade synopsis code on their screening history but no confirmation that the previous abnormality was squamous, should remain on annual screening and HPV testing is not indicated for these women.

In reports prior to Number 49 (July – December 2017), some HPV tests that were collected at colposcopy were incorrectly classified in the 'Other' category (generally within the sub-category of a recent high-grade abnormality that therefore did not meet the criteria for post-treatment management or historical testing). This has been corrected in the current report and the increase in tests collected at colposcopy is explained by this change.

Figure 96 - Volume of HPV test samples received by laboratories during the monitoring period, by age

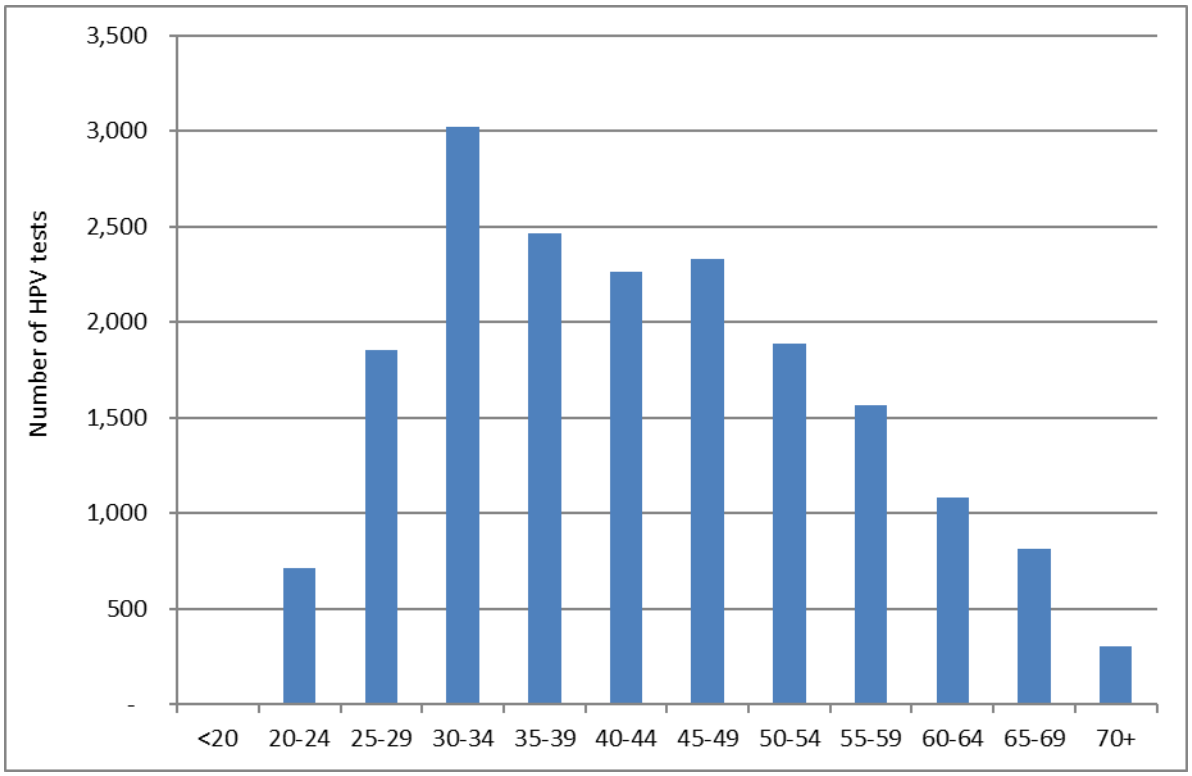


Figure 97 - Volume of HPV test samples received by laboratories during the monitoring period, by laboratory

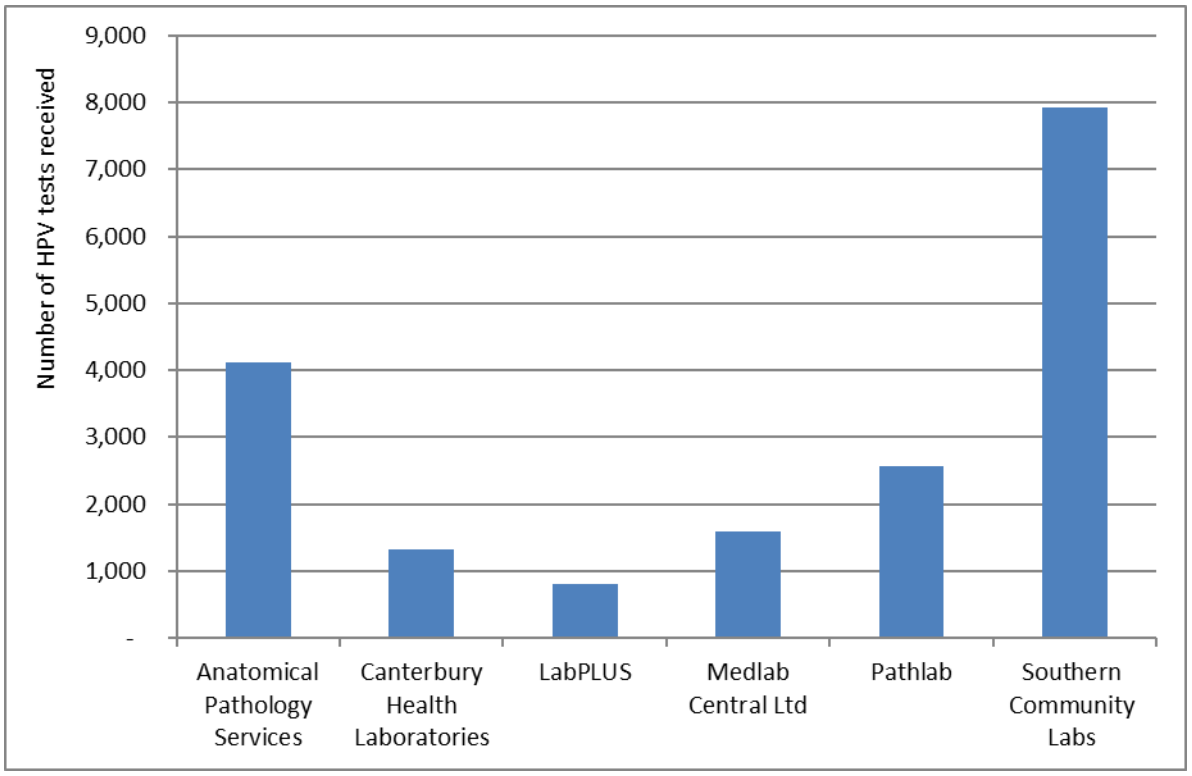
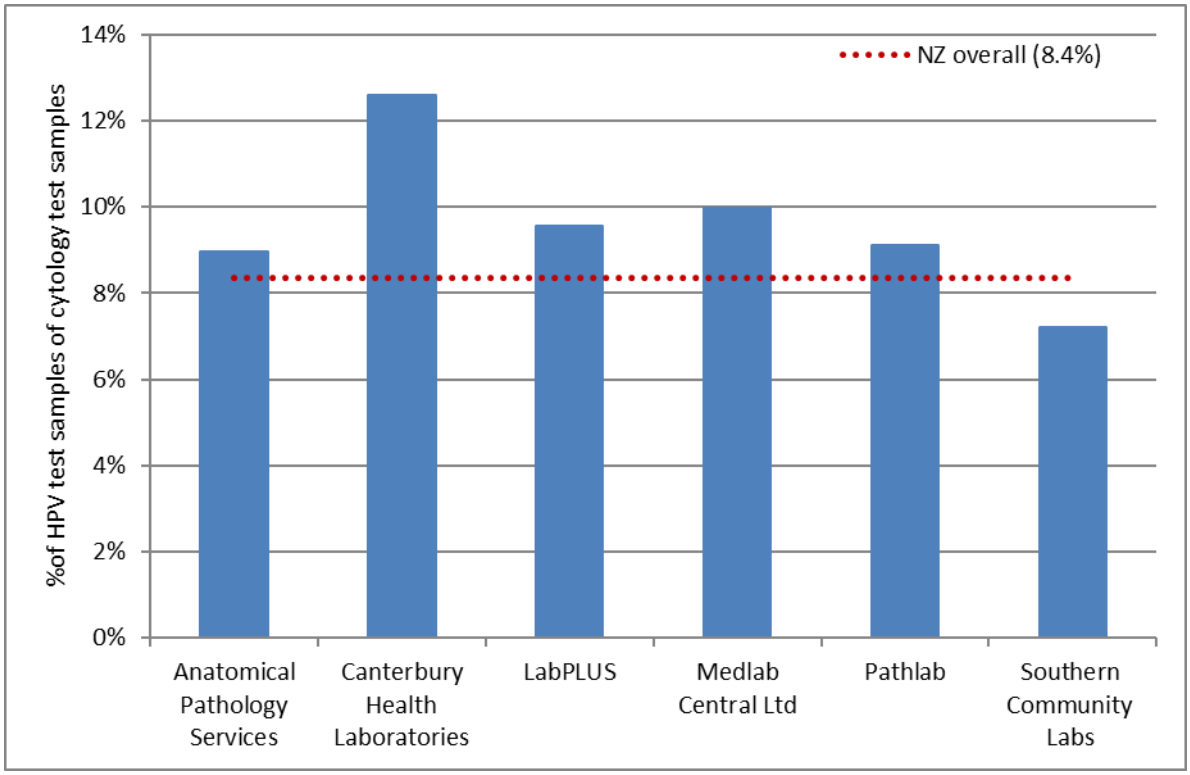


Figure 98 - HPV test samples as a percentage of cytology test samples received during the monitoring period, by laboratory



HPV tests/ colposcopy can be interpreted as the percentage of cytology tests which have an associated HPV test

Figure 99 - Volume of HPV test samples received during the monitoring period, by purpose

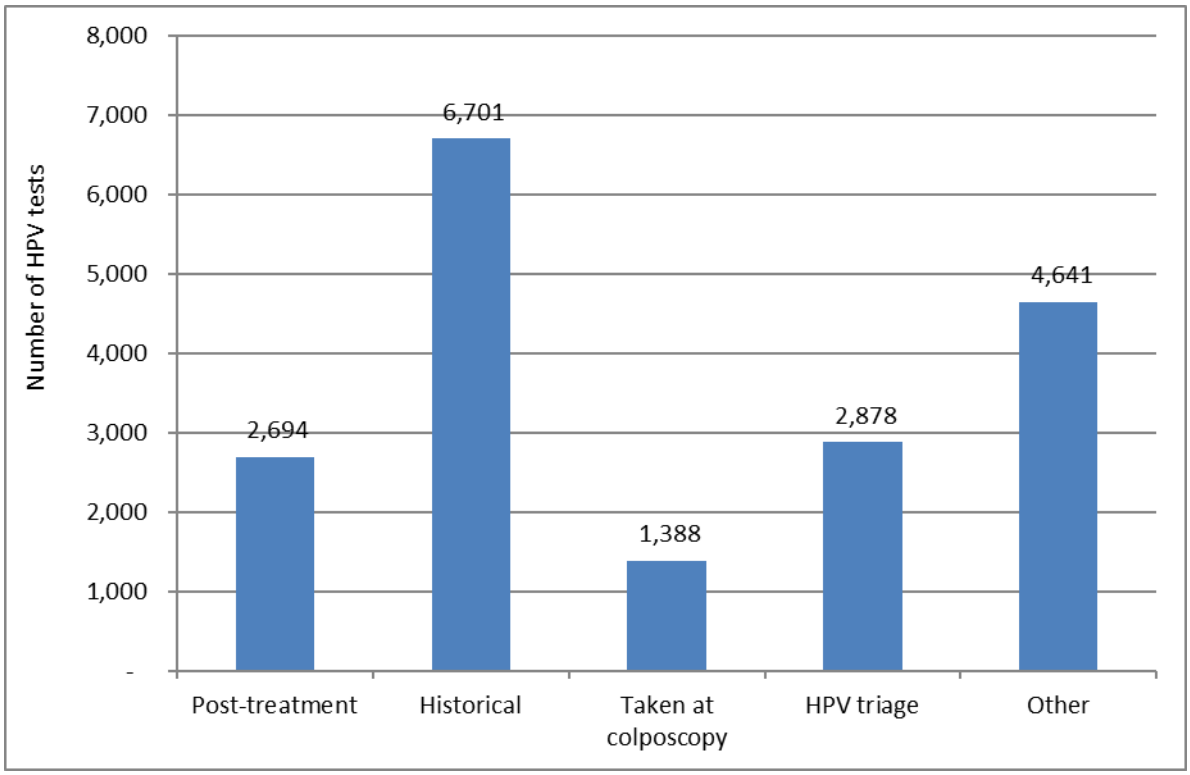


Figure 100 - HPV test samples received during the monitoring period, by purpose and age

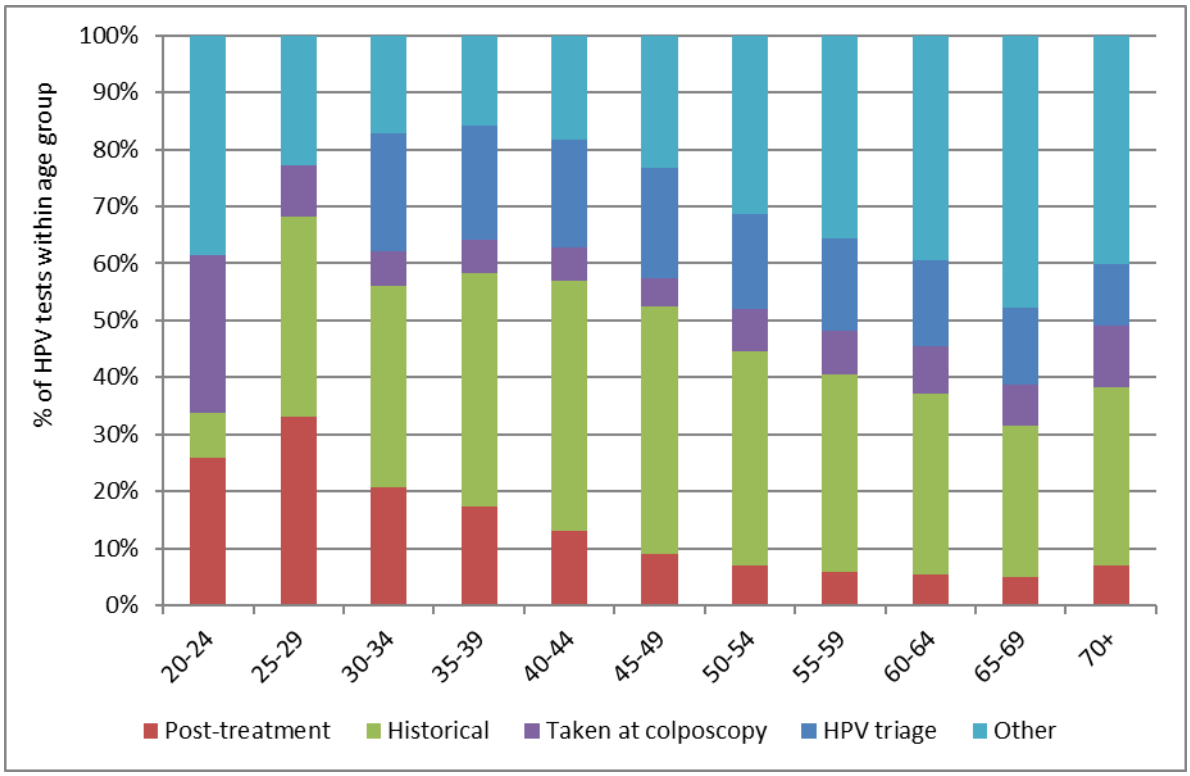


Figure 101 - HPV test samples received during the monitoring period, by purpose and laboratory

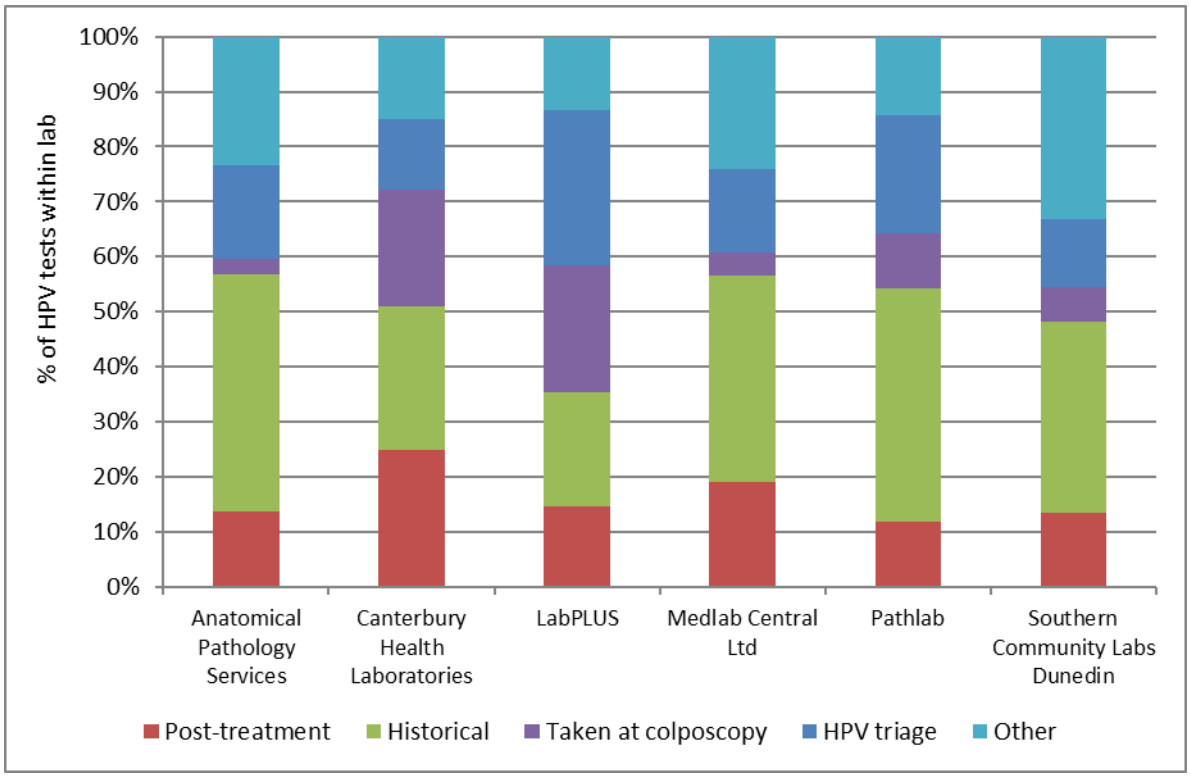
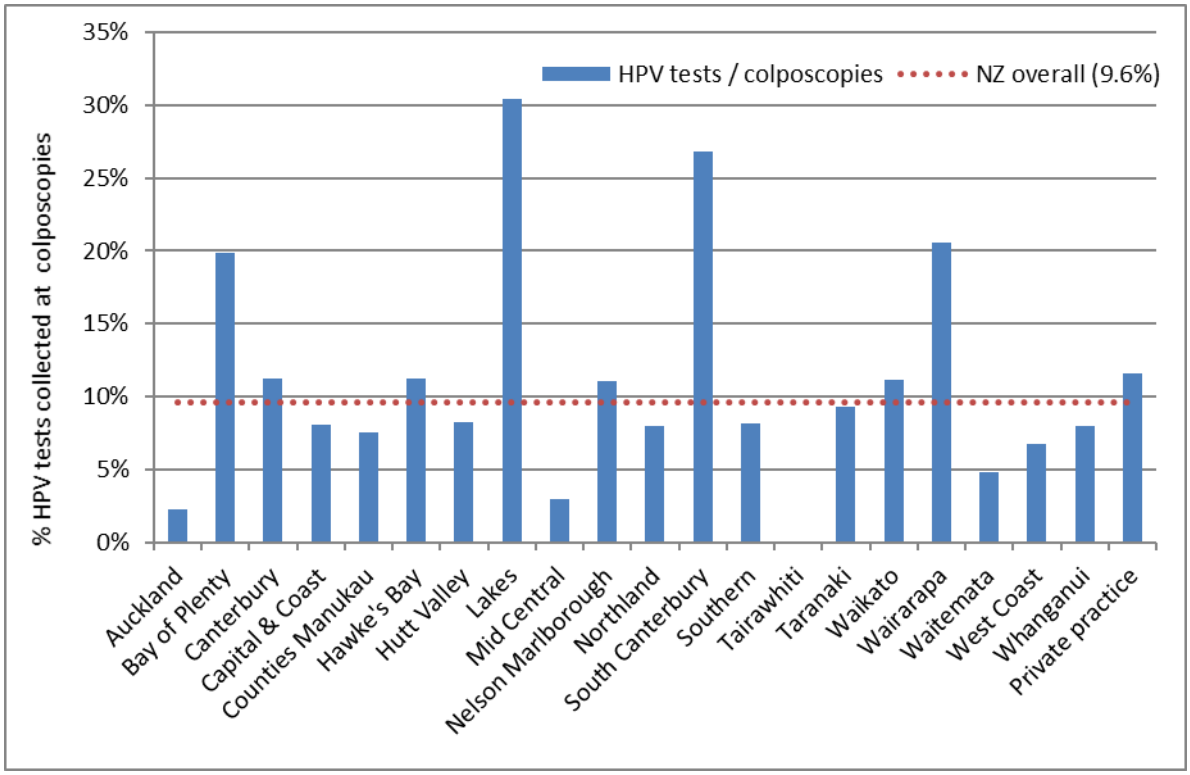


Figure 102 - HPV test samples collected at colposcopy, in relation to total colposcopies* performed in the period, by DHB



*HPV tests/ colposcopy can be interpreted broadly as the percentage of colposcopies within this DHB/ sector where a sample is collected for HPV testing. *the number of HPV tests here includes only HPV test samples where a colposcopy report record exists and is not inferred by a histology result.*

Figure 103 - Trends in volumes of HPV test samples received, by laboratory

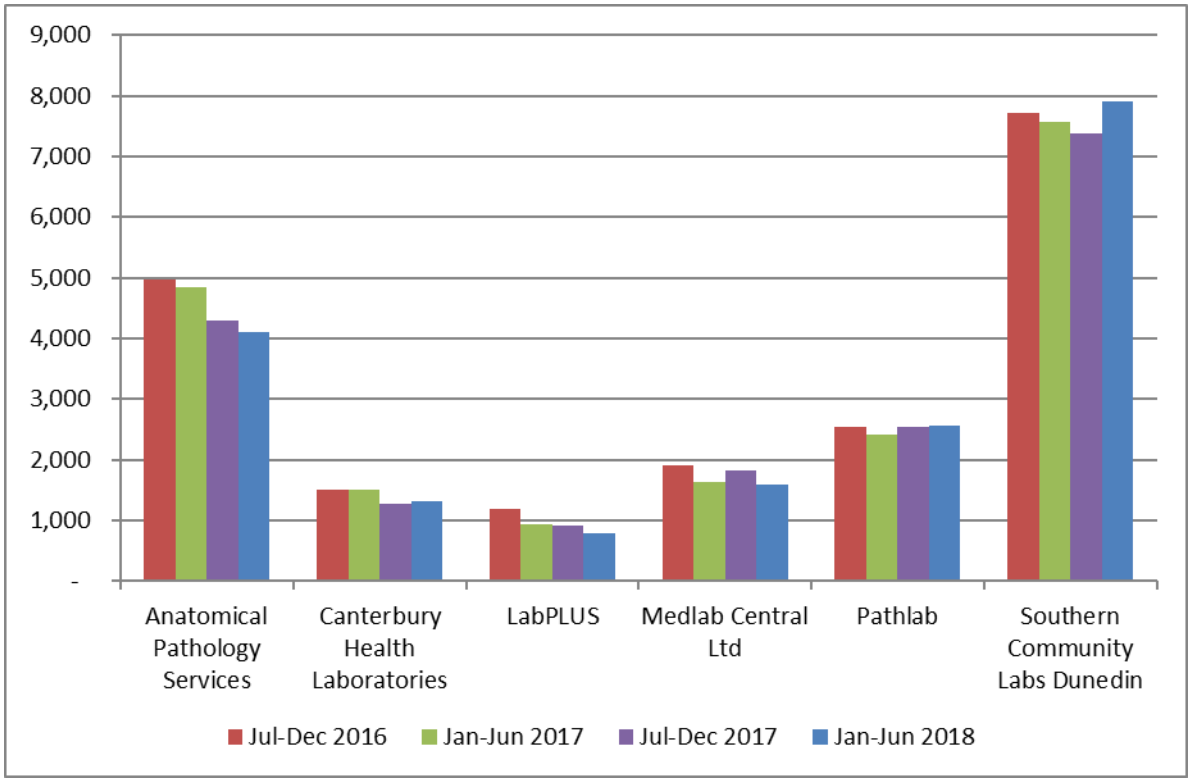


Figure 104 - Trends in volumes of HPV test samples received, by purpose

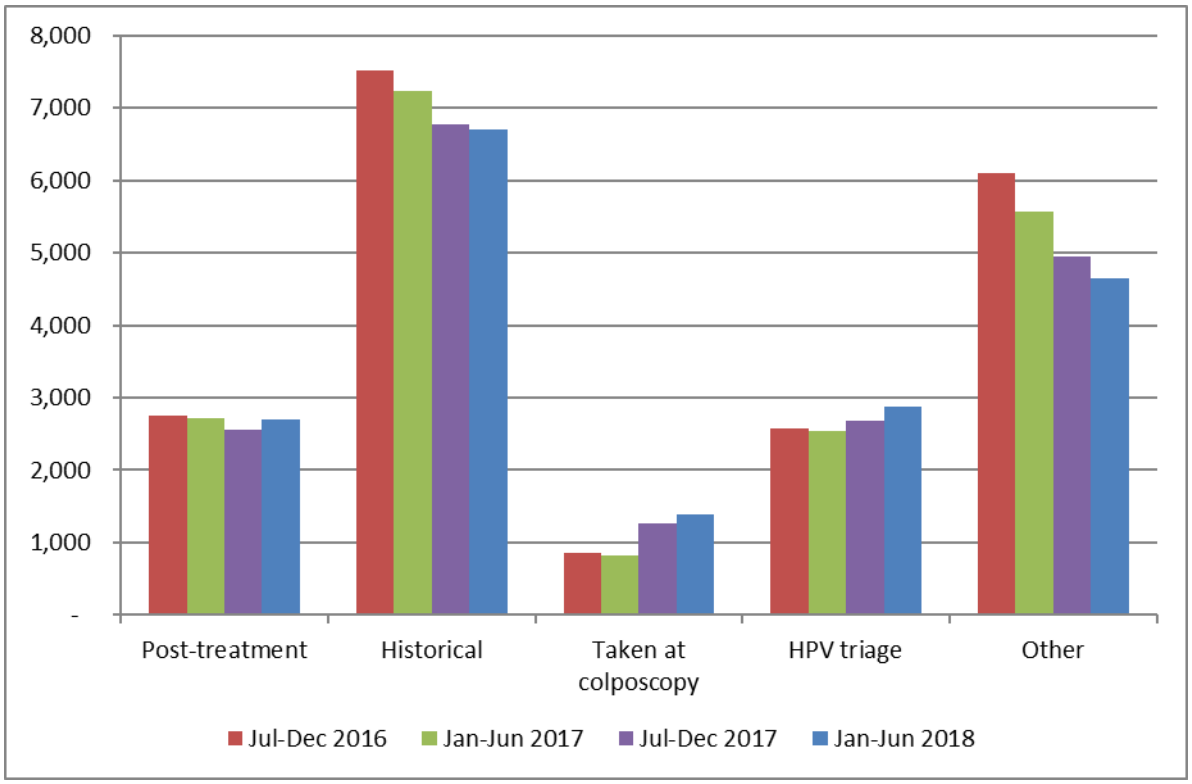
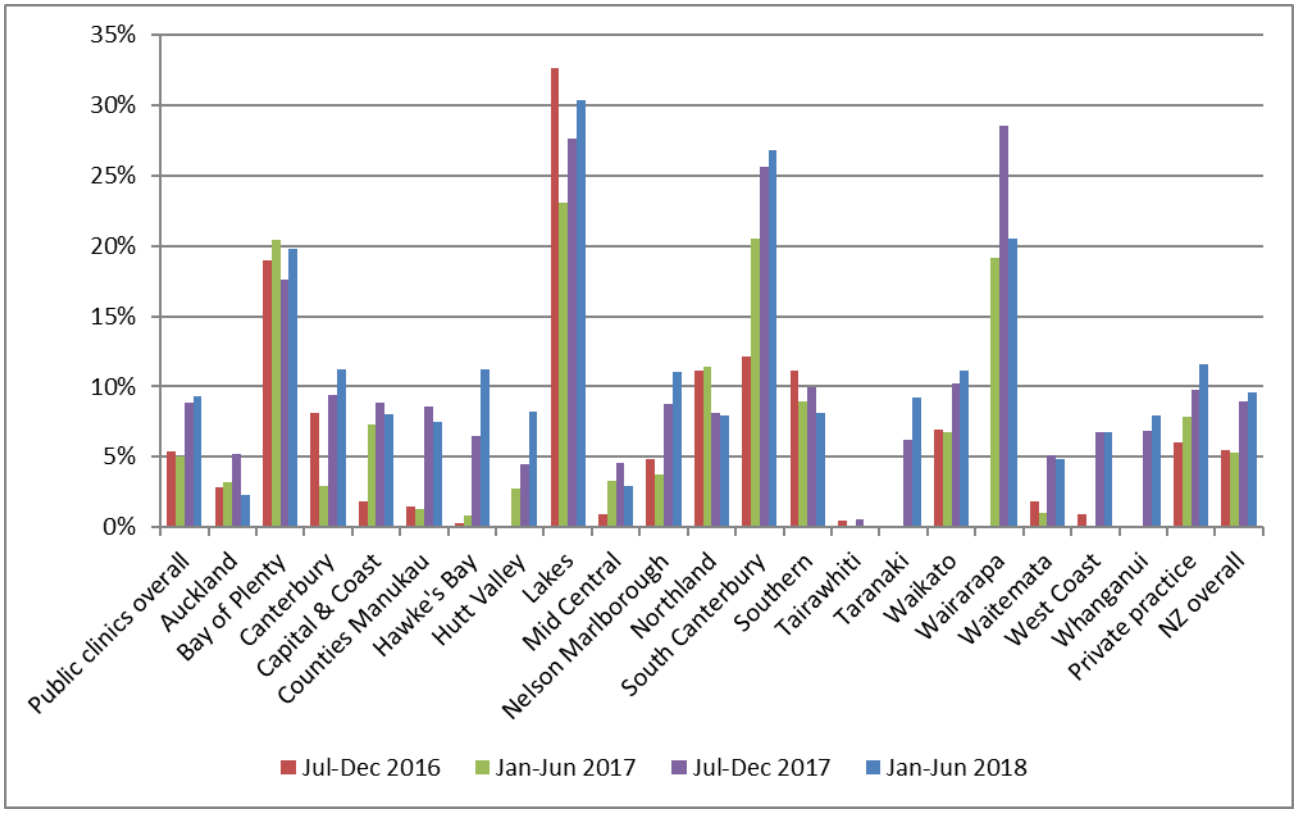


Figure 105 - Trends in HPV test samples collected at colposcopy, in relation to total colposcopies* performed in the period, by DHB



*HPV tests/ colposcopy can be interpreted broadly as the percentage of colposcopies within this DHB/ sector where a sample is collected for HPV testing. *the number of HPV tests here includes only HPV test samples where a colposcopy report record exists and is not inferred by a histology result.*

Indicator 8.3 – HPV tests for follow-up of women with a historical high-grade abnormality

Definition

NCSP Guidelines for Cervical Screening in New Zealand state that women with a previous high-grade squamous abnormality (ASC-H, HSIL, CIN 2/3) more than three years ago may benefit from two rounds of dual cytology and hrHPV testing ("historical testing"). If women test negative on both tests over two years, they can safely be screened according to the routine screening recommendations (cytology alone every three years until 70). HPV testing is not recommended for management of women with a historic non-squamous high-grade abnormality.

The purpose of this indicator is to examine the extent to which historical testing is being used for women who are eligible for it, and the outcomes of these tests.

Predominantly, women who are eligible for historical testing will be those who were eligible for it at the time it was introduced (1 October 2009), because women with more recent high-grade squamous abnormalities will be followed up with hrHPV testing in other ways (as part of standard post-treatment management and/ or use of hrHPV testing to assist in resolving discordant cytology and colposcopy/ histology). Women are considered to have been eligible for historical testing as at 1 October 2009 if:

i) They had a high-grade squamous abnormality (cytology or histology) more than three years prior to 1 October 2009, as per the definition of historical testing (i.e. prior to 1 October 2006) and

ii) They had no previous glandular abnormality (i.e. prior to 1 October 2009); and

iii) Between their historical high-grade squamous abnormality and 1 October 2009, they had *either* no cytology OR only negative cytology OR three consecutive negative cytology tests as their most recent cytology results; and

iv) They were alive on 1 October 2009.

Women were excluded, however, if they had been treated for a high-grade squamous abnormality within the three years prior to 1 October 2009, because this meant they met the criteria for *post-treatment women*, rather than *historical testing.* Note that this indicator also does not report on historical testing in any women who became eligible for it after 1 October 2009 (although as noted above, this should be a small group as women with more recent high-grade squamous abnormalities will be followed up with hrHPV testing in other ways).

Within the current report, Round 1 and Round 2 historical tests are only considered for women who were both eligible for historical testing on 1 October 2009 *and* who also remained eligible for it throughout the current monitoring period. Therefore, in the current report, women were excluded if:

i) They were not still alive at the end of the current monitoring period *(follow-up no longer possible)*; or

ii) They had a non-squamous high -grade abnormality between becoming eligible (on 1 October 2009) and the end of the current monitoring period *(no longer eligible for historical testing)*

HPV tests in these women from 1 October 2009 were retrieved. HPV tests which appeared to have been carried out for other recommended uses of HPV testing (such as HPV triage of low-grade cytology; HPV tests taken at colposcopy; or HPV tests performed to follow-up treatment of a high-grade squamous abnormality within the previous three years) were excluded since they were not performed for the purpose of historical testing. After excluding those tests, the first HPV test in each woman was defined as her Round 1 historical test. A Round 2 historical test was defined as the first HPV test which occurred at least 9 months after a Round 1 historical test.

Measures reported by age are based on the age of the women at the end of the current monitoring period (i.e. a woman's age at 30 June 2018). Measures reported by DHB are based on the geographic area relating to the woman's residence (or if this information is not available, that of her responsible health provider).

Target

Targets have not yet been set.

Current Situation

Overall women eligible for historical testing

There were 50,503 women who, at 1 October 2009, were eligible for HPV testing to follow-up a historical squamous high-grade abnormality ("historical testing"). Of these women, 49,193 are considered in the current report (the remaining women were excluded because they were no longer alive at the end of the current monitoring period, or were no longer eligible for historical testing because they had a non-squamous high-grade abnormality since 1 October 2009). There were no women eligible for historical testing who were aged less than 25 years at the end of the current monitoring period; however, this is not unexpected, as women in this age group would have been aged less than 18 years old on 1 October 2009 and few women this age are screened or treated for high-grade abnormalities (Table 88).

HPV tests performed for historical reasons

Overall, 33,472 (68.0%) of the women eligible for historical testing have a Round 1 historical test recorded on the NCSP Register. There were 28,102 women who also have a Round 2 historical tests (57.1% of eligible women; 84.0% of those with a Round 1 test).

The proportion of women with historical tests varied by age. Among women aged 25 to 69 years at the end of the current monitoring period, the proportion of eligible women with a historical test varied from 43.2% (25-29 years) to 71.0% (60-64 years) for Round 1 tests, and from 37.8% (25-29 years) to 61.1% (60-64 years) for Round 2 tests (Figure 106, Table 88).

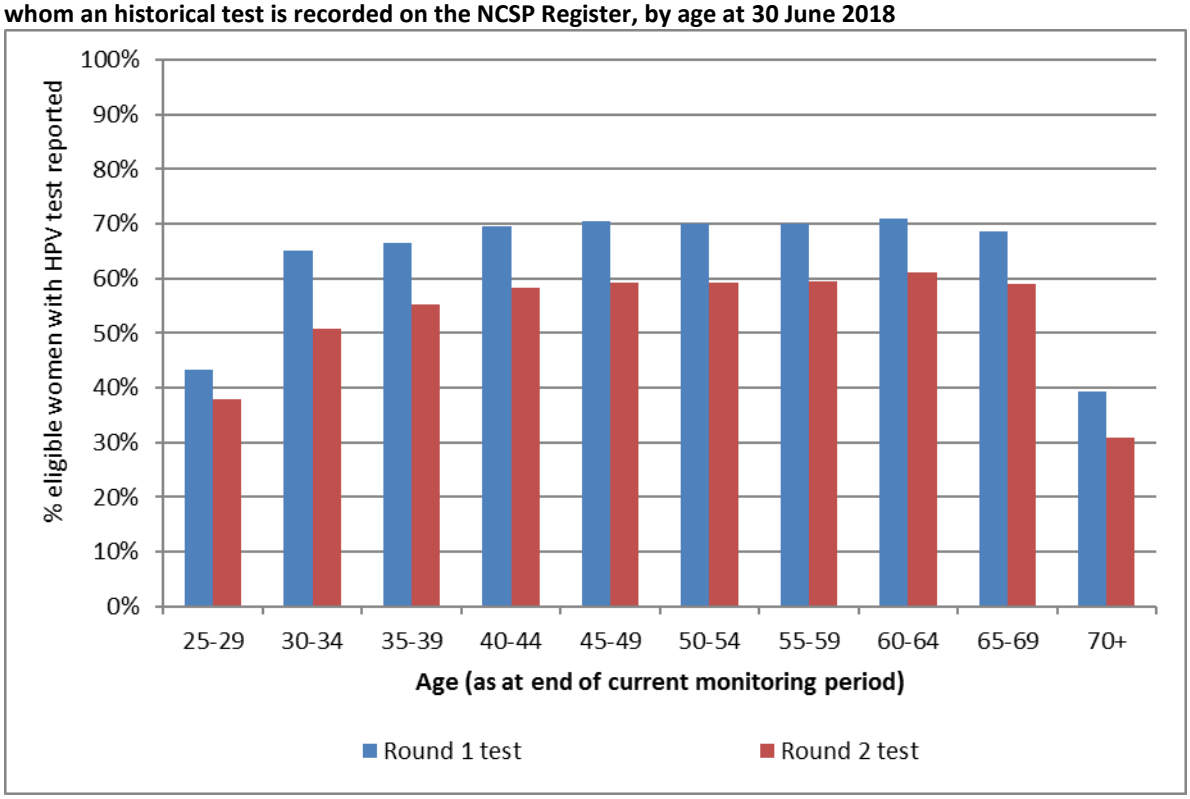
	The proportion of eligible women with historical tests also varied by DHB, from 56.3% (Counties Manukau) to 79.8% (Nelson Marlborough) for Round 1 tests, and from 43.5% (Counties Manukau) to 72.5% (Nelson Marlborough) for Round 2 tests (Figure 107, Table 89). The number of women eligible for historical testing in a given DHB did not appear to have any relationship with the proportion who had received a historical test (Figure 115). The proportion of eligible women with Round 1 historical tests ranged from 48.4% in Pacific women to 70.1% in European/ Other women (Figure 108, Table 90). For Round 2 tests, this proportion ranged from 37.9% in Pacific women to 59.8% in European/ Other women. We explored whether the proportion of women with a historical HPV test was influenced by screening participation within the previous five years (asking the question does higher screening participation for any test, increase the likelihood of initiating a historical test). The variation in the proportion of women with historical tests recorded did not appear to be fully explained by variations in screening participation, either by DHB (Figure 116, Table 91) or by ethnicity (Figure 117).
Trends	As this Indicator is reporting on the cumulative proportion of women who were eligible for HPV testing for the management of a historical high-grade squamous lesion as at 1 October 2009, the proportion is generally expected to increase over time. The proportion of eligible women with an HPV test recorded has increased since the previous report from 66.5% to 68.0% for Round 1 tests, and from 54.8% to 57.1% for Round 2 tests. It has also done so in every DHB (Figure 109), ethnicity (Figure 110) and most age groups (Figure 111) between this and the previous report. Women aged between 25-29 saw a drop in women with a Round 1 test recorded (from 53.2% to 43.2%) and Round 2 test recorded (from 40.3% to 37.8%) in the current reporting period.
Comments	This indicator currently only considers women who had a high-grade squamous abnormality more than three years prior to 1 October 2009. It is anticipated that women with more recent high-grade squamous abnormalities will be followed up via standard post-treatment management which also includes hrHPV testing. It was intended that future monitoring reports would also incorporate reporting on the use of hrHPV tests for the purpose of post-treatment management as a separate sub-indicator within Indicator 8. However, development of additional indicators has been suspended prior to the programme's planned transition to primary HPV screening, as indicators will be reviewed as part of the transition process. Planned future refinements include reporting on the proportion of the Round 1 and Round 2 historical tests where hrHPV was detected, and on how many women are able to be returned to routine screening after two rounds of negative cytology and hrHPV tests; considering women with a historical high-grade squamous abnormality who became eligible for historical testing after 1 October 2009; and taking into account whether women have attended for any

screening test, since women who have not attended for any testing could not be offered historical testing. This last point has been partially explored within the current report, by considering whether there was any relationship between the variations in women with Round 1 and Round 2 historical tests by DHB or ethnicity and the variations in screening participation within the previous five years by DHB or ethnicity. An extended period of five-years was examined for screening participation (rather than three, which is the usual measure), since it corresponds more closely than three-year participation during which we searched for HPV tests in this group of women (i.e. from 1 October 2009 to the time of the data download from NCSP Register used within this report, late February 2018). However, as women with a previous abnormality are recommended to re-attend for screening more frequently than the routine interval, the variations in overall attendance by DHB or by ethnicity may differ from the variations by DHB or ethnicity in this subgroup of women who have had a previous abnormality.

It is possible that in some cases eligible women were offered historical HPV testing, but did not consent to the test. It has not been possible to take this into account within the current report. While this affects Round 1 tests, this should be less of an issue for Round 2 tests, because in June 2015 the NCSP requested that laboratories prompt sample takers to add on an HPV test where this is indicated by the Guidelines, but was not requested by the sample taker. Additionally, for women who had already consented to the Round 1 HPV test, separate consent was not required for a Round 2 HPV test.

It is also possible that the reason some women underwent Round 1 tests, but not Round 2 tests, is because their concurrent cytology result indicated that other management (for example colposcopy referral) was required. This might be explored when this indicator is further refined to report on the test results in women who have undergone historical testing.

Figure 106 - Proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom an historical test is recorded on the NCSP Register, by age at 30 June 2018



No women aged less than 25 years at the end of the current monitoring period were eligible for historical testing on 1 October 2009.

Figure 107 - Proportion of eligible women with squamous high -grade abnormality more than 3 years ago for whom an historical test is recorded on the NCSP Register, by DHB at 30 June 2018

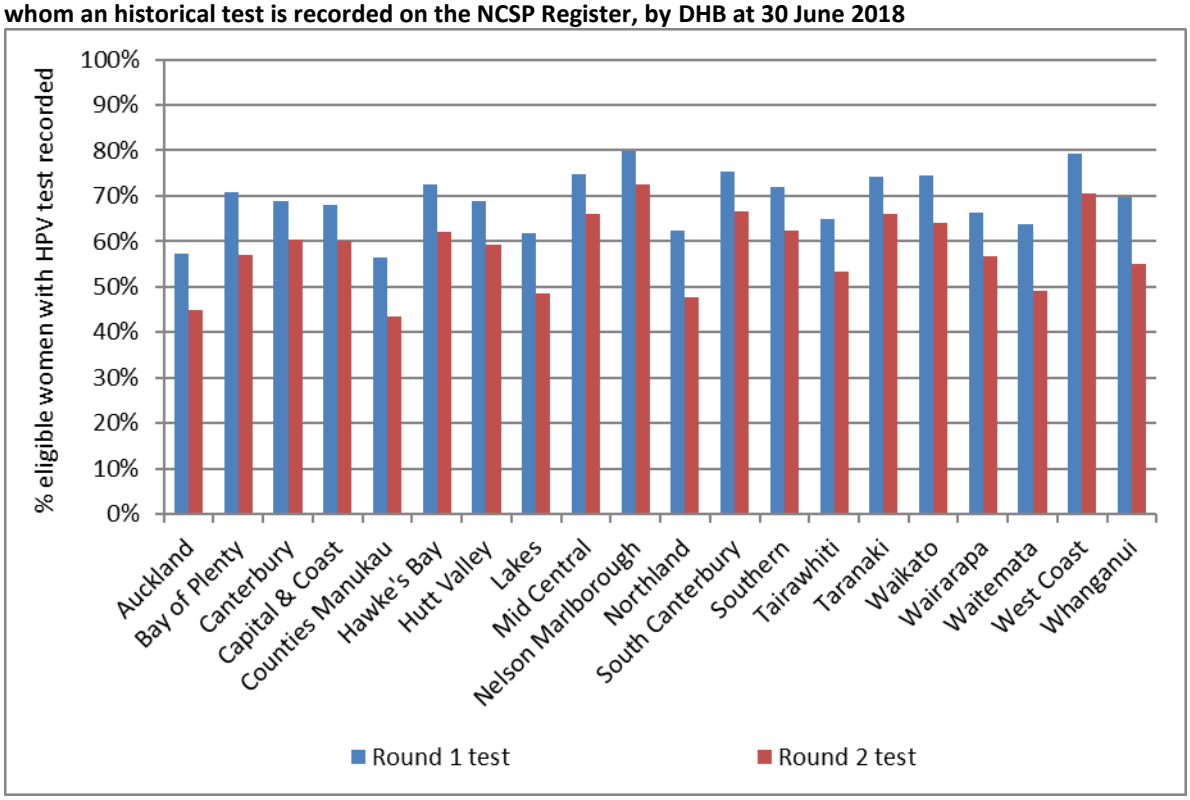


Figure 108 - Proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom an historical test is recorded on the NCSP Register, by ethnicity at 30 June 2018

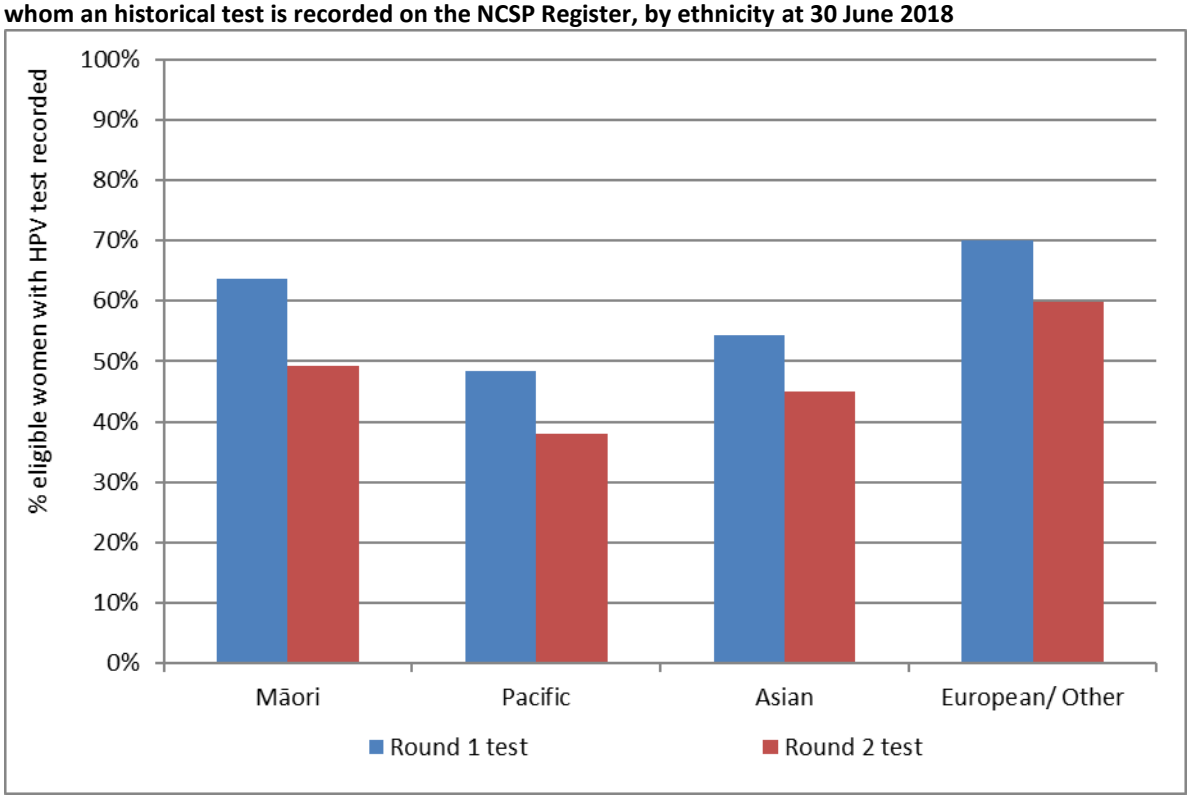


Figure 109 – Trends in the proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by DHB

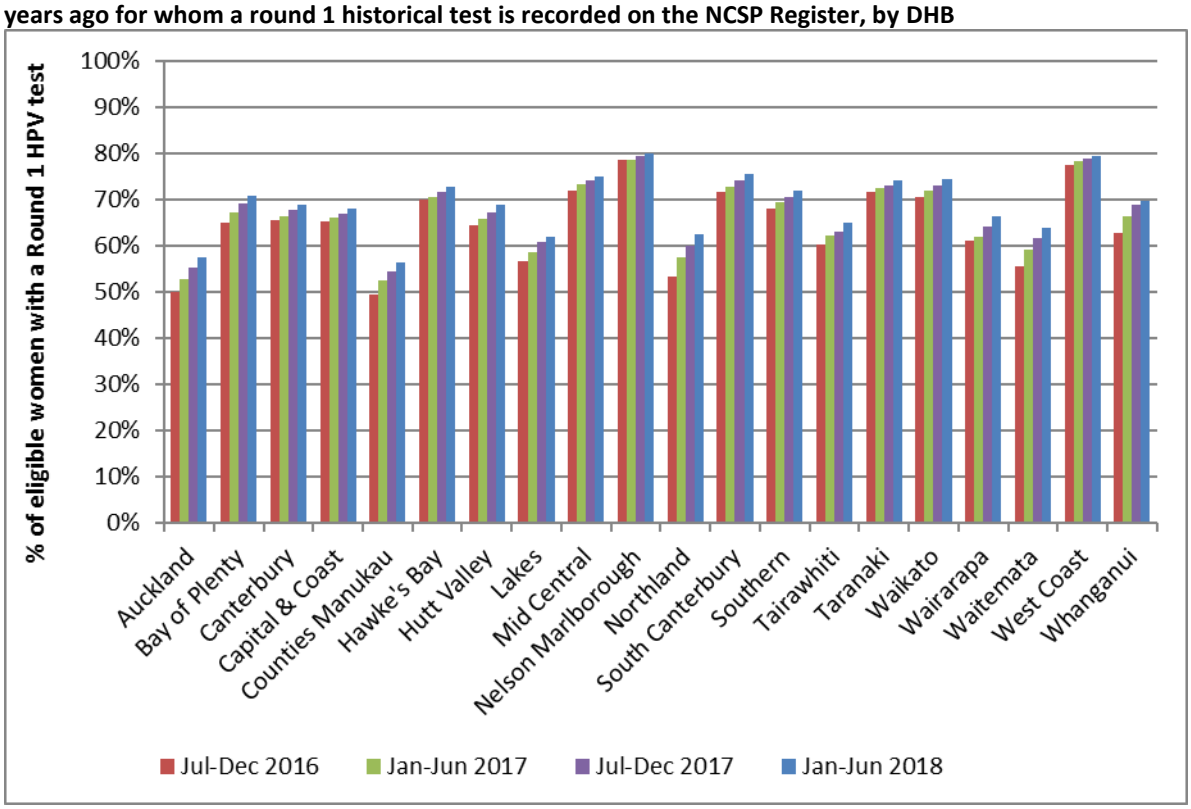


Figure 110 - Trends in the proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by ethnicity

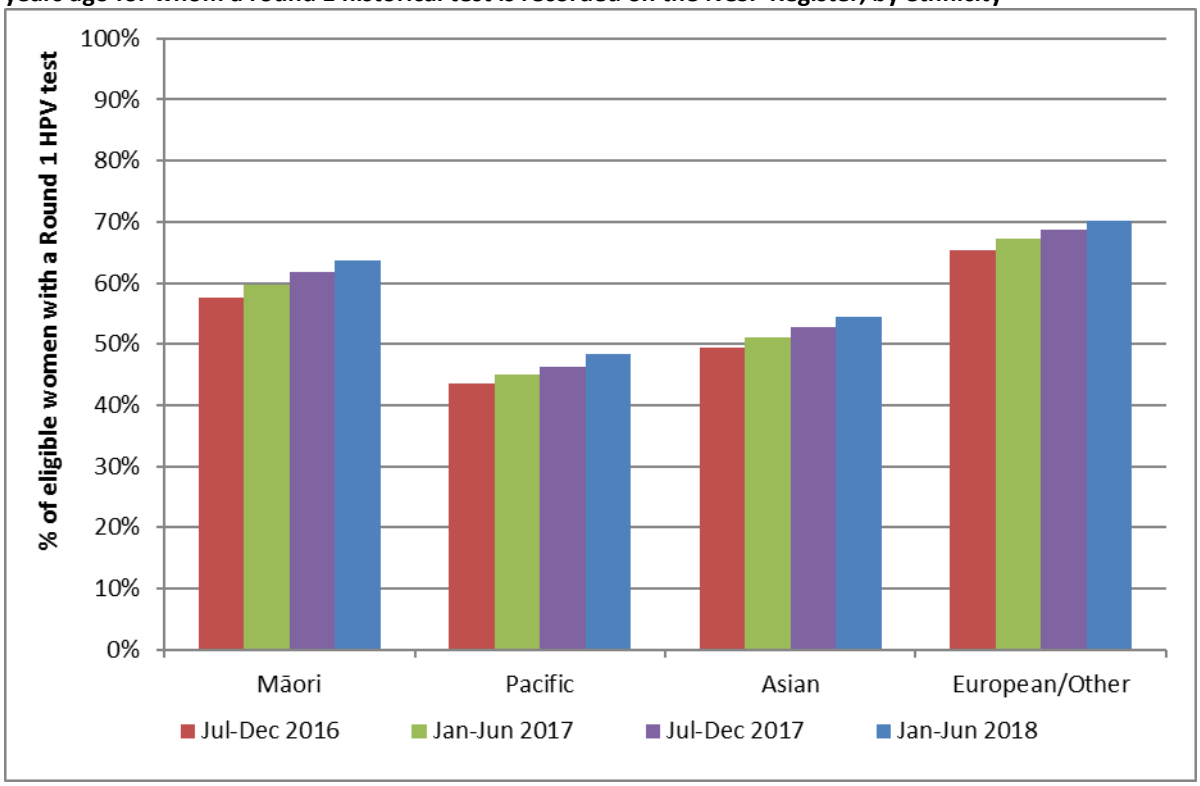
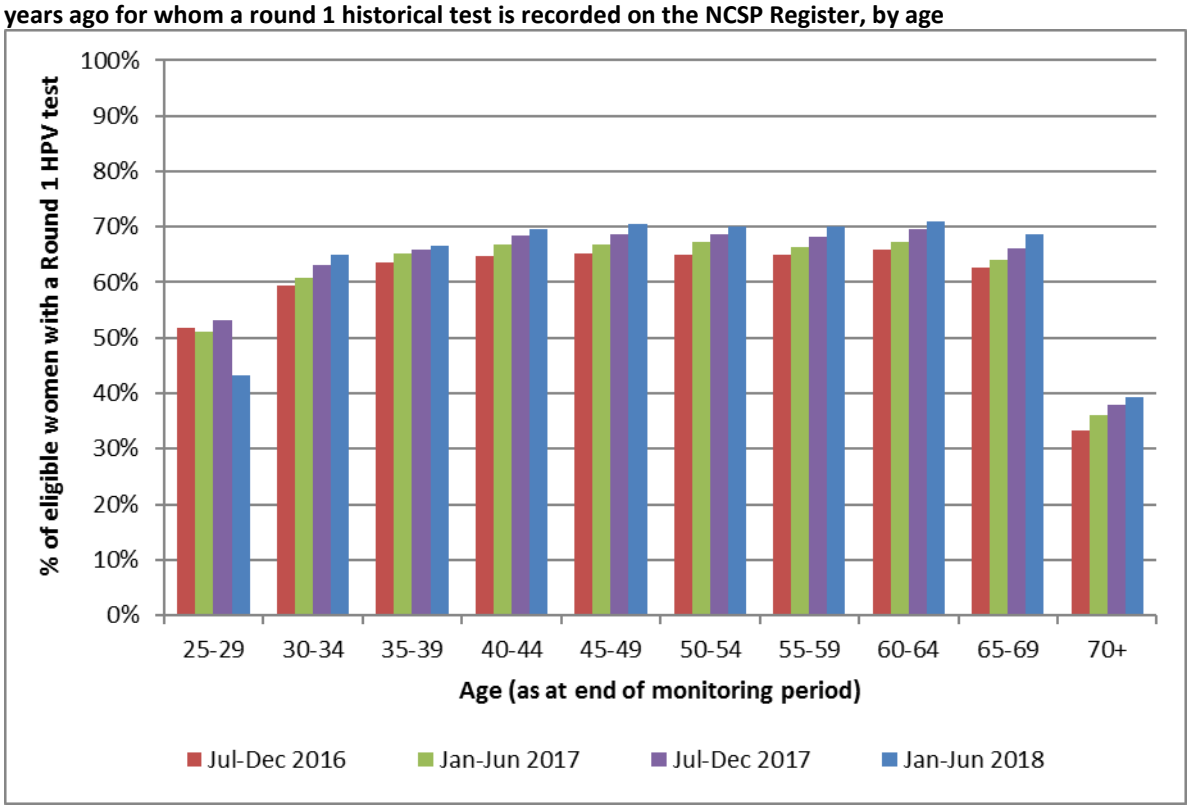


Figure 111 - Trends in the proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by age



No women aged less than 25 years at the end of the current monitoring period were eligible for historical testing on 1 October 2009.

Appendix A – Additional data

Indicator 1 - Coverage

Indicator 1.1 – Three-year coverage

Table 23 - Three-year coverage by DHB (women 25-69 years screened in the three years prior to 30 June 2018, hysterectomy adjusted)

DHB	Hysterectomy adjusted population	Women screened in the last 3 years	
	N	N	%
Auckland	154,408	104,423	67.6
Bay of Plenty	60,880	47,746	78.4
Canterbury	145,913	105,570	72.4
Capital & Coast	86,673	65,547	75.6
Counties Manukau	147,703	100,423	68.0
Hawke's Bay	42,409	30,979	73.0
Hutt Valley	40,248	29,551	73.4
Lakes	28,281	21,510	76.1
Mid Central	45,137	32,403	71.8
Nelson Marlborough	39,661	30,801	77.7
Northland	45,235	31,375	69.4
South Canterbury	15,284	11,474	75.1
Southern	83,960	63,217	75.3
Tairawhiti	12,378	9,122	73.7
Taranaki	30,966	24,404	78.8
Waikato	105,944	77,681	73.3
Wairarapa	11,725	8,340	71.1
Waitemata	169,982	119,038	70.0
West Coast	8,600	6,208	72.2
Whanganui	16,193	11,734	72.5
Total	**1,291,580**	**931,546**	**72.1**

Excludes 1 women for whom DHB could not be determined

Table 24 - Three-year coverage by ethnicity (women 25-69 years screened in the three years prior to 30 June 2018, hysterectomy adjusted)

Ethnicity	Hysterectomy adjusted population (ages 25-69 years)	Women screened in the last 3 years (ages 25-69 years)	
		N	%
Māori	171,061	105,631	61.8
Pacific	73,920	50,722	68.6
Asian	217,924	128,806	59.1
European/ Other	828,675	646,387	78.0
Total	**1,291,580**	**931,546**	**72.1**

Table 25 – Three-year coverage by age (women 20-69 years screened in the three years prior to 30 June 2018, hysterectomy adjusted)

Age	Hysterectomy adjusted population	Women screened in the last 3 years	
	N	N	%
20-24	171,787	78,780	45.9
25-29	185,876	109,485	58.9
30-34	167,487	113,201	67.6
35-39	149,850	111,004	74.1
40-44	142,822	110,191	77.2
45-49	154,838	121,252	78.3
50-54	142,297	110,891	77.9
55-59	138,392	105,404	76.2
60-64	114,892	84,567	73.6
65-69	95,126	65,551	68.9
20-69	**1,463,367**	**1,010,326**	**69.0**

Table 26 – Three-year coverage (women aged 25-69 years screened in the three years prior to 30 June 2018, hysterectomy adjusted), by ethnicity and DHB

	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	5,664	52.3	9,565	67.8	29,050	52.3	60,144	81.4
Bay of Plenty	8,440	64.0	579	64.9	2,705	53.3	36,022	86.3
Canterbury	5,707	53.9	2,206	75.9	10,524	64.2	87,133	75.1
Capital & Coast	4,985	57.8	3,412	62.5	8,392	58.6	48,758	83.7
Counties Manukau	12,021	60.2	19,810	71.1	27,239	64.2	41,353	72.0
Hawke's Bay	6,731	71.5	878	73.9	1,418	58.0	21,952	74.8
Hutt Valley	3,741	64.5	1,791	65.3	3,724	70.4	20,295	76.9
Lakes	6,130	69.8	457	80.2	1,420	50.5	13,503	83.8
Mid Central	5,082	66.8	772	73.6	2,231	53.6	24,318	75.3
Nelson Marlborough	2,261	66.7	382	75.8	1,363	63.7	26,795	79.7
Northland	8,516	63.2	430	53.2	1,169	48.5	21,260	74.5
South Canterbury	581	54.4	110	91.7	465	69.1	10,318	76.9
Southern	3,869	56.5	959	73.1	3,109	45.6	55,280	80.1
Tairawhiti	4,005	69.3	164	64.6	238	58.8	4,715	79.4
Taranaki	3,231	67.6	214	72.5	1,035	64.5	19,924	82.0
Waikato	12,970	62.3	1,815	64.3	7,256	62.1	55,640	78.8
Wairarapa	1,141	67.9	144	82.8	230	52.6	6,825	72.4
Waitemata	7,402	54.3	6,766	64.8	26,626	63.3	78,244	75.3
West Coast	549	60.6	53	59.6	209	60.4	5,397	74.3
Whanganui	2,605	68.0	215	66.0	403	48.4	8,511	76.0
NZ Overall		**61.8**		**68.6**		**59.1**		**78.0**

Ethnicity-specific estimates for some DHBs exceed 100%. This is potentially due in part to limitations in the hysterectomy prevalence estimators which are used to adjust the eligible population.

Table 27 – Three-year coverage (women aged 25-69 years screened in the three years prior to 30 June 2018, hysterectomy adjusted), by ethnicity and age

	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
25-29	16,939	57.6	7,337	52.7	14,870	40.3	70,339	66.6
30-34	14,399	60.5	6,800	62.6	22,608	60.1	69,394	72.9
35-39	12,810	60.2	6,703	69.3	21,782	66.0	69,709	81.1
40-44	12,792	62.1	6,409	71.4	15,823	63.9	75,167	85.0
45-49	13,571	64.6	6,357	72.6	15,158	63.9	86,166	85.0
50-54	11,973	66.2	5,986	76.9	12,588	62.8	80,344	83.3
55-59	10,887	65.2	4,902	79.2	10,884	62.3	78,731	80.3
60-64	7,409	62.5	3,632	82.7	9,271	64.1	64,255	76.3
65-69	4,851	58.3	2,596	77.7	5,822	58.3	52,282	71.1
NZ Overall		**61.8**		**68.6**		**59.1**		**78.0**

Table 28 – Five-year coverage by DHB (women aged 25-69 years screened in the five years prior to 30 June 2018, hysterectomy adjusted)

DHB	Hysterectomy adjusted population N	Women screened in the last 5 years N	%
Auckland	154,408	125,581	81.3
Bay of Plenty	60,880	55,362	90.9
Canterbury	145,913	125,160	85.8
Capital & Coast	86,673	77,974	90.0
Counties Manukau	147,703	121,823	82.5
Hawke's Bay	42,409	37,243	87.8
Hutt Valley	40,248	35,437	88.0
Lakes	28,281	25,302	89.5
Mid Central	45,137	38,294	84.8
Nelson Marlborough	39,661	36,099	91.0
Northland	45,235	37,922	83.8
South Canterbury	15,284	13,362	87.4
Southern	83,960	74,802	89.1
Tairawhiti	12,378	10,865	87.8
Taranaki	30,966	28,205	91.1
Waikato	105,944	90,891	85.8
Wairarapa	11,725	10,013	85.4
Waitemata	169,982	142,596	83.9
West Coast	8,600	7,423	86.3
Whanganui	16,193	13,984	86.4
Total	***1,291,580***	***1,108,338***	***85.8***

Excludes 3 women for whom DHB could not be determined

Table 29 – Five-year coverage by ethnicity (women aged 25-69 years screened in the five years prior to 30 June 2018, hysterectomy adjusted)

Ethnicity	Hysterectomy adjusted population N	Women screened in the last 5 years N	%
Māori	171,061	131,210	76.7
Pacific	73,920	64,596	87.4
Asian	217,924	151,551	69.5
European/ Other	828,675	760,981	91.8
Total	**1,291,580**	**1,108,338**	**85.8**

Table 30 - Five-year coverage by age (women 20-69 years screened in the five years prior to 30 June 2018, hysterectomy adjusted)

Age	Hysterectomy adjusted population	Women screened in the last 5 years N	%
20-24	171,787	83,863	48.8
25-29	185,876	133,435	71.8
30-34	167,487	136,000	81.2
35-39	149,850	132,633	88.5
40-44	142,822	130,979	91.7
45-49	154,838	143,947	93.0
50-54	142,297	131,610	92.5
55-59	138,392	123,694	89.4
60-64	114,892	98,931	86.1
65-69	95,126	77,109	81.1
20-69	**1,463,367**	**1,192,201**	**81.5**

Table 31 - Five-year coverage (women aged 25-69 years screened in the five years prior to 30 June 2018, hysterectomy adjusted), by ethnicity and DHB

	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	7,045	65.0	12,213	86.6	34,986	62.9	71,337	96.6
Bay of Plenty	10,461	79.3	690	77.4	3,086	60.8	41,125	98.6
Canterbury	7,037	66.5	2,777	95.5	12,180	74.3	103,166	88.9
Capital & Coast	6,191	71.7	4,389	80.5	9,856	68.8	57,538	98.8
Counties Manukau	15,156	75.9	25,475	91.4	31,952	75.3	49,240	85.7
Hawke's Bay	8,507	90.3	1,114	93.8	1,604	65.7	26,018	88.6
Hutt Valley	4,743	81.7	2,308	84.1	4,374	82.7	24,012	90.9
Lakes	7,501	85.4	548	96.1	1,635	58.1	15,618	96.9
Mid Central	6,206	81.6	944	90.0	2,535	60.8	28,609	88.5
Nelson Marlborough	2,764	81.5	453	89.9	1,548	72.3	31,334	93.2
Northland	10,809	80.2	527	65.2	1,367	56.7	25,219	88.4
South Canterbury	703	65.8	135	112.5	515	76.5	12,009	89.5
Southern	4,758	69.5	1,185	90.3	3,634	53.3	65,225	94.6
Tairawhiti	4,939	85.5	199	78.3	273	67.4	5,454	91.8
Taranaki	3,920	82.1	256	86.8	1,187	74.0	22,842	94.0
Waikato	15,804	75.9	2,233	79.1	8,259	70.7	64,595	91.5
Wairarapa	1,429	85.0	182	104.6	269	61.6	8,133	86.2
Waitemata	9,331	68.5	8,641	82.8	31,606	75.2	93,018	89.6
West Coast	683	75.4	62	69.7	231	66.8	6,447	88.8
Whanganui	3,223	84.1	265	81.3	454	54.6	10,042	89.6
NZ Overall	**131,210**	**76.7**	**64,596**	**87.4**	**151,551**	**69.5**	**760,981**	**91.8**

Ethnicity-specific estimates for some DHBs exceed 100%. This is potentially due in part to limitations in the hysterectomy prevalence estimators which are used to adjust the eligible population.

Table 32 - Women under 20 years of age, and aged 15-19 years, screened in the three years prior to 30 June 2018, by DHB.

DHB	Number of women screened in last 3 years aged 10-20 years	aged 15-19 years	% of population aged 15-19 years screened
Auckland	457	457	2.9
Bay of Plenty	240	240	3.5
Canterbury	999	997	5.7
Capital & Coast	428	428	3.9
Counties Manukau	386	385	2.0
Hawke's Bay	171	171	3.3
Hutt Valley	128	127	2.8
Lakes	92	90	2.6
Mid Central	156	156	2.6
Nelson Marlborough	140	140	3.5
Northland	107	106	2.1
South Canterbury	69	69	4.4
Southern	487	487	4.1
Tairawhiti	30	30	1.9
Taranaki	146	146	4.3
Waikato	401	400	2.9
Wairarapa	46	46	3.7
Waitemata	722	720	3.9
West Coast	42	42	5.4
Whanganui	61	61	3.3
Unspecified		-	-
Total	**5,308**	***5,298***	***3.5***

Table 33 - Women screened under 20 years of age, as a proportion of all women screened in the three years to 30 June 2018, by DHB

DHB	Women screened in last 3 years aged < 20 years	Women screened in last 3 years all ages	Proportion of women screened who were aged < 20 years (%)
Auckland	457	115,176	0.4
Bay of Plenty	240	52,913	0.5
Canterbury	999	118,803	0.8
Capital & Coast	428	74,539	0.6
Counties Manukau	386	110,843	0.3
Hawke's Bay	171	34,497	0.5
Hutt Valley	128	32,422	0.4
Lakes	92	23,688	0.4
Mid Central	156	36,544	0.4
Nelson Marlborough	140	33,884	0.4
Northland	107	34,649	0.3
South Canterbury	69	12,750	0.5
Southern	487	72,375	0.7
Tairawhiti	30	10,160	0.3
Taranaki	146	27,066	0.5
Waikato	401	87,445	0.5
Wairarapa	46	9,315	0.5
Waitemata	722	131,368	0.5
West Coast	42	6,861	0.6
Whanganui	61	13,080	0.5
Unspecified	-	-	-
Total	**5,308**	**1,038,378**	**0.5**

Table 34 - Women screened under 20 years of age, and women aged 18-19 years when they were screened, in the three years to 30 June 2018, by DHB

DHB	Number of women screened in last 3 years aged 10-19 years	aged 18-19 years	% aged 18-19 years
Auckland	457	429	93.9
Bay of Plenty	240	220	91.7
Canterbury	999	869	87.0
Capital & Coast	428	406	94.9
Counties Manukau	386	338	87.6
Hawke's Bay	171	150	87.7
Hutt Valley	128	113	88.3
Lakes	92	80	87.0
Mid Central	156	147	94.2
Nelson Marlborough	140	121	86.4
Northland	107	91	85.0
South Canterbury	69	59	85.5
Southern	487	438	89.9
Tairawhiti	30	25	83.3
Taranaki	146	133	91.1
Waikato	401	370	92.3
Wairarapa	46	41	89.1
Waitemata	722	628	87.0
West Coast	42	36	85.7
Whanganui	61	54	88.5
Unspecified	*#N/A*	*#N/A*	*#N/A*
Total	***5,308***	***4,748***	***89.4***

Table 35 – Estimated age-specific prevalence of hysterectomy in New Zealand, used to perform hysterectomy adjustment

Age group	Estimated hysterectomy prevalence (%) Report 49	Report 48
20-24	0.016%	0.344%
25-29	0.171%	0.913%
30-34	0.781%	1.789%
35-39	2.406%	3.503%

40-44	5.447%	6.561%
45-49	8.494%	10.030%
50-54	12.135%	13.283%
55-59	14.428%	17.529%
60-64	18.282%	23.689%
65-69	21.916%	29.103%

Based on estimates from Cleary and Wright[1] (Report 49) and Gray[2] (Report 48)

Table 36 - Women (25-69 years) screened in the three years to 30 June 2018, as a percentage of the i) hysterectomy-adjustment NZ female population and ii) total NZ female population, by DHB

DHB	Women screened in the last 3 years (hysterectomy-adjusted)	Women screened in the last 3 years (no hysterectomy adjustment)
Auckland	67.6	62.8
Bay of Plenty	78.4	70.9
Canterbury	72.4	65.9
Capital & Coast	75.6	69.5
Counties Manukau	68.0	62.6
Hawke's Bay	73.0	65.9
Hutt Valley	73.4	67.0
Lakes	76.1	69.1
Mid Central	71.8	65.1
Nelson Marlborough	77.7	69.7
Northland	69.4	62.4
South Canterbury	75.1	67.4
Southern	75.3	68.4
Tairawhiti	73.7	66.9
Taranaki	78.8	71.5
Waikato	73.3	66.8
Wairarapa	71.1	63.9
Waitemata	70.0	64.2
West Coast	72.2	65.0
Whanganui	72.5	65.4
Total	***72.1***	***65.8***

Table 37 - Trends in three-year coverage by DHB (women screened in the previous three years, as a percentage of the hysterectomy-adjusted female population)

DHB	To 31 Dec 2016	T0 30 Jun 2017	To 31 Dec 2017	To 30 Jun 2018
Auckland	78.5%	77.4%	70.6%	67.6%
Bay of Plenty	81.3%	81.1%	80.3%	78.4%
Canterbury	74.6%	74.5%	73.7%	72.4%
Capital & Coast	80.1%	79.3%	78.3%	75.6%
Counties Manukau	74.0%	73.2%	71.8%	68.0%
Hawke's Bay	75.7%	75.9%	76.3%	73.0%
Hutt Valley	77.7%	76.7%	76.0%	73.4%
Lakes	78.5%	78.1%	77.0%	76.1%
Mid Central	75.1%	74.9%	73.9%	71.8%
Nelson Marlborough	79.9%	80.0%	80.4%	77.7%
Northland	73.0%	73.0%	71.8%	69.4%
South Canterbury	77.0%	76.2%	76.9%	75.1%
Southern	79.6%	79.9%	78.5%	75.3%
Tairawhiti	73.7%	74.3%	75.8%	73.7%
Taranaki	79.3%	78.9%	81.0%	78.8%
Waikato	76.2%	76.5%	75.6%	73.3%
Wairarapa	73.6%	73.6%	75.2%	71.1%
Waitemata	75.9%	75.2%	73.4%	70.0%
West Coast	72.3%	71.1%	75.3%	72.2%
Whanganui	75.8%	74.8%	75.1%	72.5%
Total	**76.8%**	**76.4%**	**74.8%**	**72.1%**

Note:
Updated hysterectomy estimates and population projections were used to calculate coverage for 31 December 2017 and 30 June 2018 (2017 update 2013 Census and 2018 update 2013 Census, respectively). Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.

Table 38 - Trends in three-year coverage by age (women screened in the previous three years, as a percentage of the hysterectomy-adjusted female population)

Age	To 31 Dec 2016	T0 30 Jun 2017	To 31 Dec 2017	To 30 Jun 2018
20-24	51.0%	50.3%	47.5%	45.9%
25-29	65.5%	65.0%	60.8%	58.9%
30-34	72.5%	72.1%	69.4%	67.6%
35-39	78.0%	77.8%	76.1%	74.1%
40-44	79.9%	79.9%	78.7%	77.2%
45-49	81.4%	81.0%	80.5%	78.3%
50-54	80.7%	80.1%	79.5%	77.9%
55-59	80.1%	79.6%	79.4%	76.2%
60-64	79.9%	79.3%	79.1%	73.6%
65-69	75.5%	75.2%	75.8%	68.9%
Total	**73.7%**	**73.3%**	**71.6%**	**69.0%**

Note:
Updated hysterectomy estimates and population projections were used to calculate coverage for 31 December 2017 and 30 June 2018 (2017 update 2013 Census and 2018 update 2013 Census, respectively). Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.

Table 39 - Trends in three-year coverage by ethnicity (women screened in the previous three years, as a percentage of the hysterectomy-adjusted female population)

Ethnicity	To 31 Dec 2016	T0 30 Jun 2017	To 31 Dec 2017	To 30 Jun 2018
Māori	64.1%	64.0%	62.0%	61.8%
Pacific	75.1%	74.3%	73.4%	68.6%
Asian	66.6%	67.2%	63.4%	59.1%
European/ Other	81.7%	81.1%	80.4%	78.0%
Total	**76.8%**	**76.4%**	**74.8%**	***72.1%***

Note:
Updated hysterectomy estimates and population projections were used to calculate coverage for 31 December 2017 and 30 June 2018 (2017 update 2013 Census and 2018 update 2013 Census, respectively). Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.

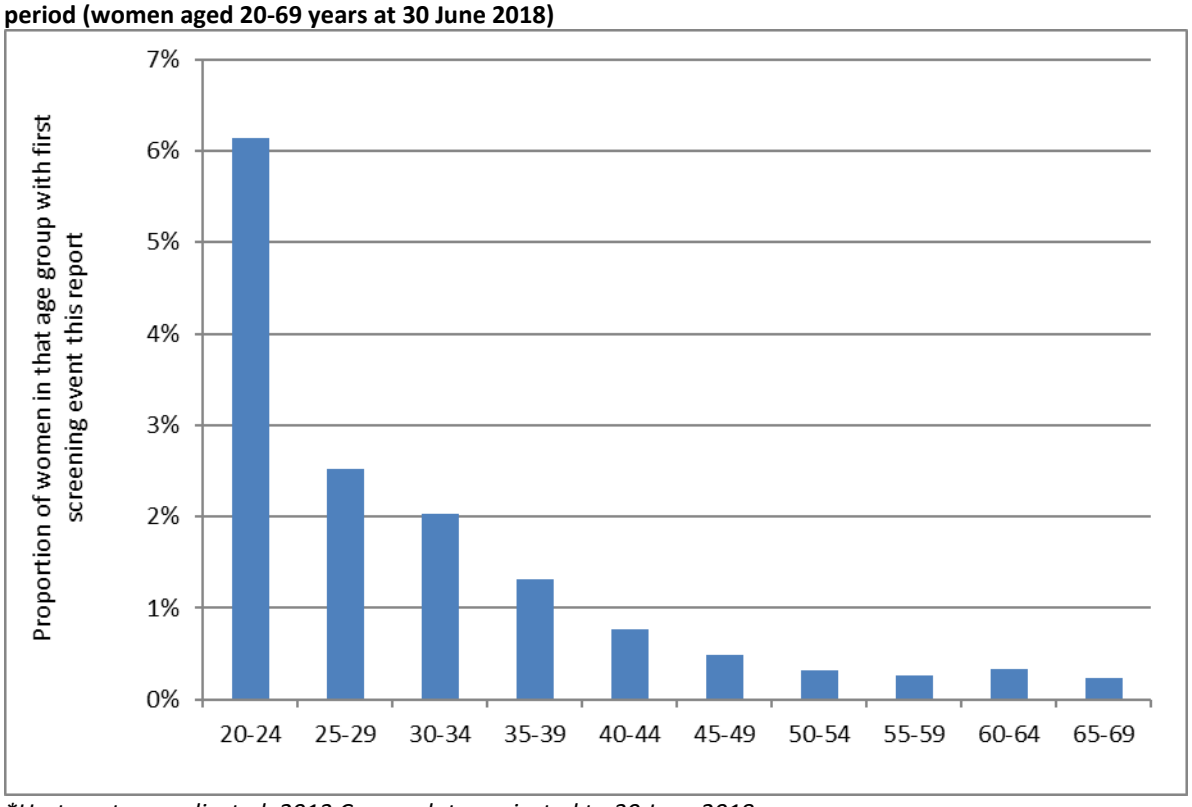
Indicator 2 – First screening events

Table 40 - Age distribution of first screening events for period 1 January – 30 June 2018

Age	Women with first events	% of first events (ages 20-69 yrs) which occurred in that age group
20-24	10,546	44.1
25-29	4,695	19.6
30-34	3,407	14.2
35-39	1,977	8.3
40-44	1,093	4.6
45-49	755	3.2
50-54	462	1.9
55-59	373	1.6
60-64	381	1.6
65-69	222	0.9
20-69 yrs	**23,911**	100.0

Percentage = number of first screens in age group divided by total number of first screens x 100

Figure 112 - Proportion of population* in that age group with their first screening event during the monitoring period (women aged 20-69 years at 30 June 2018)



**Hysterectomy adjusted, 2013 Census data projected to 30 June 2018.*

Table 41 - Women (aged 20-69 years) with first screening events as a proportion of i) total number of women with screening events, and ii) eligible women, by DHB, for period 1 January – 30 June 2018

DHB	Women with first events N	As a proportion of women with a screening event		As a proportion of eligible population	
		N	%	N	%
Auckland	3,639	24,808	14.7	180,032	2.0
Bay of Plenty	971	11,377	8.5	67,109	1.4
Canterbury	2,850	25,615	11.1	165,750	1.7
Capital & Coast	1,983	15,537	12.8	101,161	2.0
Counties Manukau	2,913	22,352	13.0	168,799	1.7
Hawke's Bay	571	6,829	8.4	46,689	1.2
Hutt Valley	580	6,600	8.8	44,647	1.3
Lakes	514	5,342	9.6	31,581	1.6
Mid Central	732	8,041	9.1	52,016	1.4
Nelson Marlborough	533	6,910	7.7	42,801	1.2
Northland	561	6,991	8.0	49,755	1.1
South Canterbury	160	2,392	6.7	16,589	1.0
Southern	1,741	14,781	11.8	97,268	1.8
Tairawhiti	173	2,114	8.2	13,803	1.3
Taranaki	377	5,380	7.0	33,856	1.1
Waikato	1,918	18,209	10.5	120,391	1.6
Wairarapa	120	1,886	6.4	12,815	0.9
Waitemata	3,237	27,891	11.6	191,067	1.7
West Coast	91	1,243	7.3	9,310	1.0
Whanganui	247	2,837	8.7	17,928	1.4
Total	**23,911**	**217,135**	**11.0**	**1,463,367**	**1.6**

Note: Proportions shown are women with first screening event within a DHB, divided by i) all women with a screening event within that DHB (first or subsequent events) and ii) the hysterectomy-adjusted 2013 Census population projected to 30 June 2018 for that DHB, as a percent. Total women screened and women with first events exclude those for whom DHB could not be ascertained.

Table 42 - Women (ages 20-69 years) with first screening events as a proportion of i) total number of women with screening events, and ii) eligible women, by ethnicity, for period 1 January – 30 June 2018

Ethnicity	Women with first events	As a proportion of women with a screening event[i]		As a proportion of eligible population[ii]	
		N	%	N	%
Māori	2,593	26,195	9.9	204,537	1.3
Pacific	1,522	10,879	14.0	88,743	1.7
Asian	6,703	29,713	22.6	246,780	2.7
European/ Other	13,093	150,348	8.7	923,307	1.4
Total	**23,911**	**217,135**	**11.0**	**1,463,367**	**1.6**

Note: Proportions shown are women with first screening event in an ethnicity group, divided by i) all women with a screening event within that ethnicity group (first or subsequent events) and ii) the hysterectomy-adjusted 2013 Census population projected to 30 June 2018 for that ethnicity group, as a percent.

Table 43 - Median age of women with a first screening event, by ethnicity, for period 1 January – 30 June 2018

Ethnic Group	Median Age	Mean Age
Māori	22	*24.4*
Pacific	25	*28.8*
Asian	31	*33.3*
European/ Other	24	*27.9*

Indicator 3 – Withdrawal rates

Table 44 - Number of women who withdrew from the NCSP Register 1 January – 30 June 2018 by age, and proportion of women who were enrolled at the start of the monitoring period who withdrew

Age	Enrolled at start	Women withdrawn	
	N	N	%
<20	785	-	0
20-24	73,493	1	0.001
25-29	144,966	2	0.001
30-34	169,010	1	0.001
35-39	179,598	2	0.001
40-44	185,351	2	0.001
45-49	205,349	3	0.001
50-54	191,941	2	0.001
55-59	183,251	4	0.002
60-64	149,388	4	0.003
65-69	120,935	1	0.001
70+	277,942	-	<0.001
Total (all ages)	**1,882,009**	**22**	**0.001**
Total (20-69)	**1,603,282**	**22**	**0.001**

** As a proportion of women enrolled at the start of the monitoring period*

Table 45 - Number of women (aged 20-69 years) who withdrew from the NCSP Register 1 January – 30 June 2018 by ethnicity, and proportion of women who were enrolled at the start of the monitoring period who withdrew

Ethnicity	Enrolled at start	Women withdrawn	
	N	N	%
Māori	200,575	1	0.000
Pacific	102,093	1	0.001
Asian	198,132	2	0.001
European/ Other	1,102,482	18	0.002
Total	**1,603,282**	**22**	**0.001**

** As a proportion of women enrolled at the start of the monitoring period*

Indicator 4 – Early re-screening

Table 46 - Early re-screening by five-year age group

Age	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
20-24	1,077	171	15.9
25-29	4,125	585	14.2
30-34	4,551	599	13.2
35-39	4,942	643	13.0
40-44	5,436	702	12.9
45-49	6,104	755	12.4
50-54	5,635	708	12.6
55-59	5,480	649	11.8
60-64	4,468	407	9.1
65-69	3,219	247	7.7
All ages	**45,037**	**5,466**	**12.1**

Table 47 - Early re-screening by DHB

DHB	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
Auckland	4,875	684	14.0
Bay of Plenty	2,394	335	14.0
Canterbury	5,164	742	14.4
Capital & Coast	3,329	298	9.0
Counties Manukau	4,136	509	12.3
Hawke's Bay	1,723	181	10.5
Hutt Valley	1,512	116	7.7
Lakes	1,031	118	11.4
Mid Central	1,678	146	8.7
Nelson Marlborough	1,518	157	10.3
Northland	1,569	154	9.8
South Canterbury	615	69	11.2
Southern	3,179	381	12.0
Tairawhiti	433	36	8.3
Taranaki	1,214	147	12.1
Waikato	3,785	368	9.7
Wairarapa	420	70	16.7
Waitemata	5,499	891	16.2
West Coast	310	20	6.5
Whanganui	653	44	6.7
Unspecified	-	-	0.0
Total	**45,037**	**5,466**	**12.1**

Table 48 - Early re-screening by ethnicity

Ethnicity	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
Māori	5,008	572	11.4
Pacific	2,150	180	8.4
Asian	5,190	617	11.9
European/ Other	32,689	4,097	12.5
Total	**45,037**	**5,466**	**12.1**

Indicator 5 – Laboratory indicators

Indicator 5.1 – Laboratory cytology reporting

Table 49 - Age-standardised percentage of satisfactory smears reported as HSIL, by laboratory

	% satisfactory smears reported as HSIL	
Laboratory	**Age-standardised rate* (20-69 years)**	**Crude rate**
Anatomical Pathology Services	0.52%	0.57%
Canterbury Health Laboratories	0.88%	1.00%
LabPLUS	2.14%	2.32%
Medlab Central Ltd.	0.99%	1.05%
Pathlab	0.43%	0.46%
Southern Community Laboratories	0.78%	0.83%
Total	**0.75%**	**0.81%**

** Age-standardised to the NZ 2013 Census population (females, ages 20-69 years)*

Indicator 5.2 – Accuracy of cytology predicting HSIL

Table 50 - Positive predictive value of a report of HSIL + SC cytology, excluding samples from colposcopy, by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	137	93.2	106	77.4	10	6.8	147
Canterbury Health Laboratories	29	93.5	24	82.8	2	6.5	31
LabPLUS	27	84.4	21	77.8	5	15.6	32
Medlab Central Ltd	99	93.4	85	85.9	7	6.6	106
Pathlab	82	94.3	67	81.7	5	5.7	87
Southern Community Labs Dunedin	498	93.6	396	79.5	34	6.4	532
Total	**872**	**93.3**	**699**	**80.2**	**63**	**6.7**	**935**

Target: 65% - 85%

Table 51 – Comparison of PPV based on original method vs updated method excluding samples from colposcopy, by cytology category and laboratory

	HSIL+SC				ASC-H				HSIL + SC + ASC-H			
	Original method		Updated (ex colp)		*Original method*		Updated (ex colp)		*Original Method*		Updated (ex colp)	
Lab	*PPV (%)*	*Based on (N)**	PPV	Based on (N)*	*PPV*	*Based on (N)**	PPV	Based on (N)*	*PPV*	*Based on (N)**	PPV	Based on (N)*
Anatomical Pathology Services	*77.4*	*155*	77.4	137	*50.0*	*136*	54.7	139	*64.6*	*291*	65.9	276
Canterbury Health Laboratories	*87.7*	*65*	82.8	29	*63.2*	*106*	62.7	59	*72.5*	*171*	69.3	88
LabPLUS	*85.7*	*147*	77.8	27	*44.0*	*150*	53.2	47	*64.6*	*297*	62.2	74
Medlab Central Ltd	*86.9*	*130*	85.9	99	*56.6*	*83*	54.7	75	*75.1*	*213*	72.4	174
Pathlab	*82.5*	*114*	81.7	82	*42.1*	*95*	53.3	92	*64.1*	*209*	66.7	174

Southern Community Labs	*81.2*	*693*	79.5	498	*52.3*	*155*	55.6	144	*75.9*	*848*	74.1	642
Total	***82.3***	***1,304***	**80.2**	**872**	***50.9***	***725***	**55.4**	**556**	***71.1***	***2,029***	**70.5**	**1,428**

* Number of women with histology within 6 months of cytology sample

Table 52 - Positive predictive value of a report of HSIL + SC cytology (original method), by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	155	93.9	120	77.4	10	6.1	165
Canterbury Health Laboratories	65	92.9	57	87.7	5	7.1	70
LabPLUS	147	90.2	126	85.7	16	9.8	163
Medlab Central Ltd.	130	92.9	113	86.9	10	7.1	140
Pathlab	114	95.0	94	82.5	6	5.0	120
Southern Community Laboratories	693	92.9	563	81.2	53	7.1	746
Total	**1,304**	**92.9**	**1,073**	**82.3**	**100**	**7.1**	**1,404**

Target: 65% - 85%

Table 53 - Positive predictive value of a report of ASC-H cytology, excluding samples from colposcopy, by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	139	84.2	76	54.7	26	15.8	165
Canterbury Health Laboratories	59	90.8	37	62.7	6	9.2	65
LabPLUS	47	78.3	25	53.2	13	21.7	60
Medlab Central Ltd	75	82.4	41	54.7	16	17.6	91

Pathlab	92	77.3	49	53.3	27	22.7	119
Southern Community Labs Dunedin	144	86.2	80	55.6	23	13.8	167
Total	**556**	**83.4**	**308**	**55.4**	**111**	**16.6**	**667**

Table 54 - Positive predictive value of a report of ASC-H cytology (original method), by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	136	84.0	68	50.0	26	16.0	162
Canterbury Health Laboratories	106	86.9	67	63.2	16	13.1	122
LabPLUS	150	72.8	66	44.0	56	27.2	206
Medlab Central Ltd.	83	80.6	47	56.6	20	19.4	103
Pathlab	95	77.9	40	42.1	27	22.1	122
Southern Community Laboratories	155	82.4	81	52.3	33	17.6	188
Total	**725**	**80.3**	**369**	**50.9**	**178**	**19.7**	**903**

Table 55 - Positive predictive value of a report of ASC-H + HSIL + SC cytology, excluding samples from colposcopy, by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	276	88.5	182	65.9	36	11.5	312
Canterbury Health Laboratories	88	91.7	61	69.3	8	8.3	96
LabPLUS	74	80.4	46	62.2	18	19.6	92
Medlab Central Ltd	174	88.3	126	72.4	23	11.7	197

Pathlab	174	84.5	116	66.7	32	15.5	206
Southern Community Labs Dunedin	642	91.8	476	74.1	57	8.2	699
Total	**1,428**	**89.1**	**1,007**	**70.5**	**174**	**10.9**	**1,602**

Table 56 - Positive predictive value of a report of ASC-H + HSIL + SC cytology (original method), by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	291	89.0	188	64.6	36	11.0	327
Canterbury Health Laboratories	171	89.1	124	72.5	21	10.9	192
LabPLUS	297	80.5	192	64.6	72	19.5	369
Medlab Central Ltd.	213	87.7	160	75.1	30	12.3	243
Pathlab	209	86.4	134	64.1	33	13.6	242
Southern Community Laboratories	848	90.8	644	75.9	86	9.2	934
Total	**2,029**	**87.9**	**1,442**	**71.1**	**278**	**12.1**	**2,307**

Table 57 – Change in categorisation of women with high grade cytology results between the original and updated method excluding samples from colposcopy

		Original method				
		ASC-H		HSIL + SC		
		<CIN2	CIN2+	<CIN2	CIN2+	Total
Updated method	**ASC-H**	242	243	5	66	**556**
	HSIL + SC	0	0	173	699	**872**
	Excluded*	114	126	53	308	**601**
	Total	**356**	**369**	**231**	**1,073**	**2,029**

* cytology samples were excluded if they collected at the same facility and on the same date as either a colposcopy visit or a histology sample for the same woman (presumed to have been collected at a colposcopy visit)

Indicator 5.4 – Histology Reporting

Figure 113 - Trends in histologically-confirmed HSIL as a percentage of all women with histology (to 1 January – 30 June 2018)

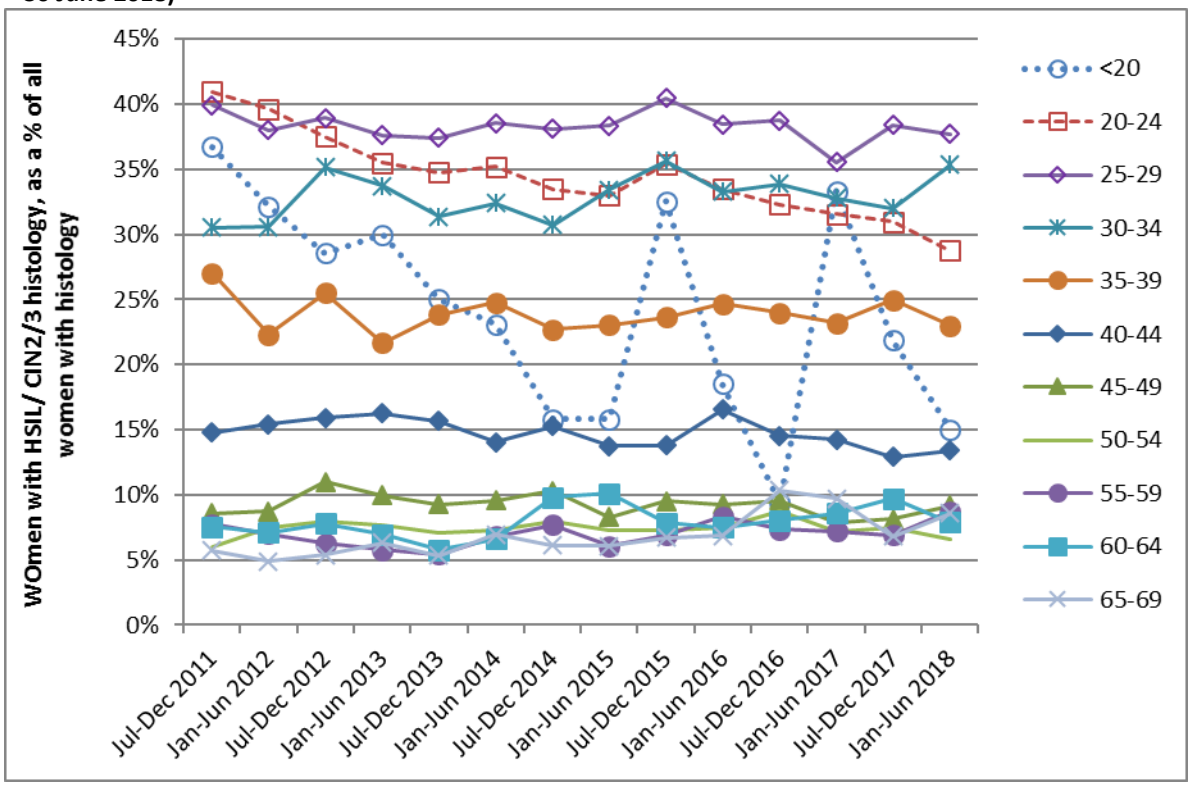


Figure 114 - Rate of women with CIN 2/3 per 1,000 women screened, by age, 1 January 2008 – 30 June 2018

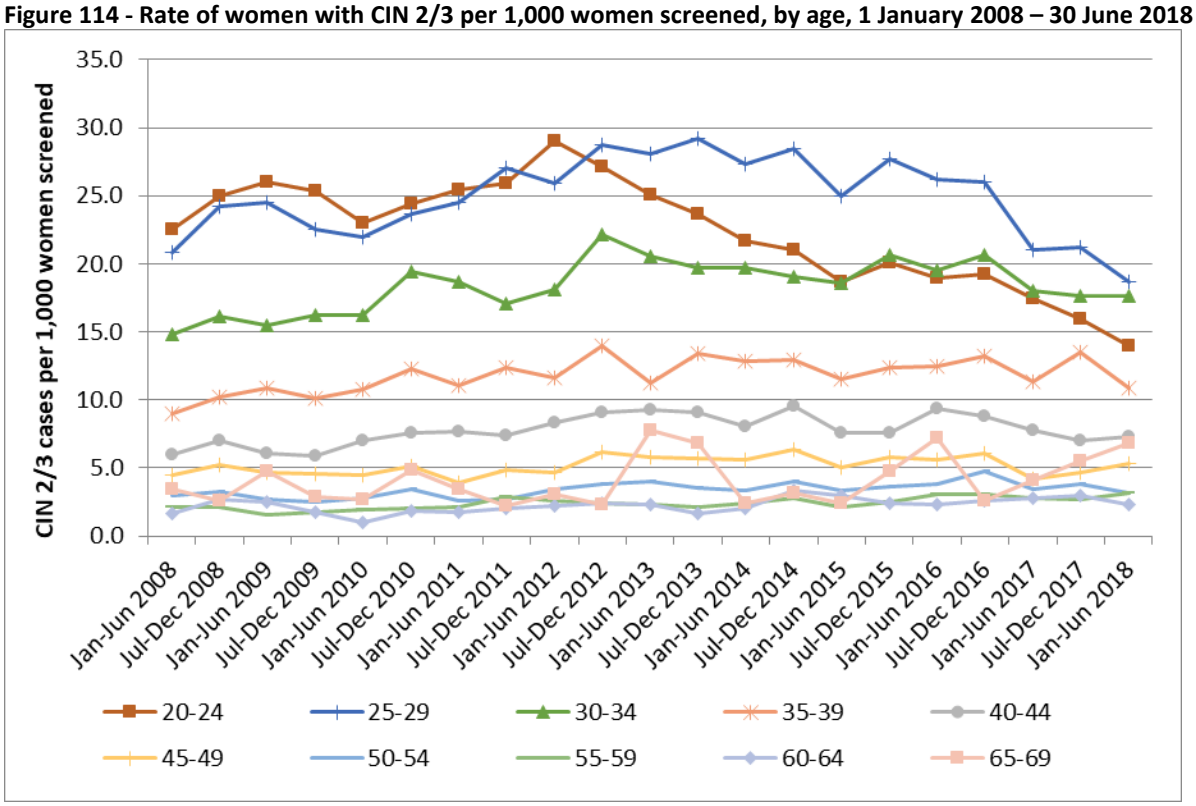


Table 58 - Rate of women with CIN 2/3 per 1,000 women screened, by age and ethnicity and for NZ overall, 1 January – 30 June 2018

	Ethnicity				
DHB	**Māori**	**Pacific**	**Asian**	**European/ Other**	**NZ overall**
<20	10.8	0.0	0.0	4.7	5.5
20-24	14.1	7.0	7.5	15.2	14.0
25-29	22.7	11.2	5.2	21.8	18.7
30-34	22.9	14.1	7.9	20.1	17.6
35-39	12.6	11.5	9.5	10.9	10.9
40-44	9.1	4.1	7.2	7.3	7.3
45-49	7.0	5.8	4.2	5.2	5.3
50-54	4.1	3.7	4.0	2.9	3.2
55-59	6.1	6.7	4.2	2.4	3.2
60-64	2.0	6.2	2.2	2.2	2.4
65-69	1.1	2.2	4.8	2.4	2.5
70+	14.6	14.9	7.4	6.2	6.8
ASR (20-69 years)^	**12.0**	**7.9**	**6.1**	**10.8**	**10.0**

^Age Standardised to the WHO population (ages 20-69 years)

Table 59 - Rate of women, per 1,000 women screened, with CIN 2/3 histology, by age and ethnicity, July-Dec 2008 to Jan-Jun 2018

		Period																			
Ethnicity name	Age Group	Jul-Dec 2008	Jan-Jun 2009	Jul-Dec 2009	Jan-Jun 2010	Jul-Dec 2010	Jan-Jun 2011	Jul-Dec 2011	Jan-Jun 2012	Jul-Dec 2012	Jan-Jun 2013	Jul-Dec 2013	Jan-Jun 2014	Jul-Dec 2014	Jan-Jun 2015	Jul-Dec 2015	Jan-Jun 2016	Jul-Dec 2016	Jan-Jun 2017	Jul-Dec 2017	Jan-Jun 2018
Māori	<20	18.9	21.5	23.0	8.6	19.5	14.4	24.1	16.8	12.2	0.0	0.0	0.0	14.6	7.2	15.7	7.6	0.0	20.8	14.5	10.8
Māori	20-24	25.7	29.0	30.7	25.5	27.7	23.4	30.7	31.5	29.3	27.5	30.7	24.6	23.4	19.7	20.3	20.1	18.8	19.5	16.7	14.1
Māori	25-29	30.4	33.4	32.3	28.9	28.1	30.1	34.9	33.7	41.2	39.3	38.3	37.0	40.0	32.1	33.5	27.4	33.6	25.0	29.1	22.7
Māori	30-34	26.8	20.8	19.3	24.6	31.4	26.9	22.0	27.3	33.4	29.3	30.3	28.7	24.7	30.9	30.0	23.5	30.1	22.3	26.8	22.9
Māori	35-39	13.7	16.1	16.0	19.7	17.4	14.9	17.4	16.9	13.7	18.2	20.2	17.1	16.8	17.3	21.7	18.2	18.1	19.2	19.3	12.6
Māori	40-44	10.5	9.5	9.0	10.6	10.1	12.6	11.3	10.9	9.5	10.2	13.0	9.9	13.8	12.5	10.9	14.4	14.9	14.4	8.9	9.1
Māori	45-49	6.6	11.6	9.2	4.7	7.9	6.2	6.7	6.4	6.0	8.7	7.4	7.2	9.5	8.8	10.1	5.5	7.0	5.9	7.3	7.0
Māori	50-54	7.7	6.5	2.4	4.5	5.1	4.6	2.2	8.1	8.6	6.0	3.9	5.1	8.1	8.0	5.4	5.0	8.4	4.0	4.4	4.1
Māori	55-59	4.4	3.3	5.3	0.7	4.1	2.6	8.5	4.5	3.8	2.5	1.9	3.5	2.9	3.3	2.0	4.2	3.9	4.3	4.9	6.1
Māori	60-64	5.8	4.9	2.2	4.6	2.8	2.0	4.0	3.9	2.8	3.7	2.7	5.2	9.3	7.1	3.9	5.4	4.6	2.4	3.0	2.0
Māori	65-69	6.0	1.9	3.8	5.6	1.7	1.7	3.4	0.0	6.4	6.4	1.6	1.4	1.4	3.8	3.8	3.8	11.0	1.2	1.2	1.1
Māori	70+	8.5	0.0	0.0	0.0	0.0	0.0	8.0	7.5	7.5	8.6	17.7	13.3	0.0	0.0	7.9	9.0	0.0	0.0	7.8	14.6
Pacific	<20	11.0	11.6	7.2	0.0	0.0	0.0	0.0	10.6	0.0	0.0	27.8	21.3	0.0	0.0	0.0	0.0	0.0	52.6	0.0	0.0
Pacific	20-24	10.9	11.2	12.9	13.7	15.1	12.3	10.2	15.0	16.9	14.1	14.0	7.5	9.9	8.9	12.7	6.8	9.6	5.7	5.0	7.0
Pacific	25-29	12.5	6.2	7.5	8.8	16.2	16.0	14.3	13.6	15.1	13.2	14.7	16.3	22.9	17.6	12.3	14.3	15.0	16.3	14.7	11.2
Pacific	30-34	10.5	9.3	11.4	11.9	10.5	10.7	6.2	18.4	18.7	11.8	13.0	13.7	16.5	16.0	14.4	13.1	20.4	17.1	14.8	14.1
Pacific	35-39	3.4	8.8	6.6	7.2	9.5	7.1	8.1	10.4	14.2	12.8	11.7	10.0	13.3	8.0	8.5	6.6	9.8	6.3	12.4	11.5
Pacific	40-44	8.2	4.6	3.0	4.2	4.8	5.3	8.3	7.4	10.2	8.1	7.4	6.2	9.3	4.5	3.5	8.5	11.3	7.6	6.4	4.1
Pacific	45-49	7.5	7.8	4.1	3.3	4.7	4.2	4.8	7.4	8.1	5.7	3.7	4.6	4.7	5.1	5.2	5.8	6.8	3.3	3.4	5.8
Pacific	50-54	4.4	1.2	2.4	1.1	6.1	3.2	2.0	5.7	8.2	6.1	2.7	3.9	1.8	5.2	3.4	5.0	2.7	2.5	4.9	3.7
Pacific	55-59	2.8	1.6	4.3	1.4	2.7	1.4	1.5	2.7	2.8	6.5	3.9	4.0	3.3	2.1	1.2	1.1	2.3	4.7	5.5	6.7
Pacific	60-64	2.4	2.3	4.1	2.1	5.7	8.3	3.8	5.2	3.6	1.7	1.6	0.0	3.3	1.5	1.5	2.8	3.0	3.1	4.5	6.2
Pacific	65-69	3.6	0.0	0.0	0.0	0.0	3.2	3.1	2.8	0.0	2.7	5.0	2.4	2.5	2.3	0.0	2.2	7.0	7.1	4.7	2.2
Pacific	70+	0.0	15.9	15.6	15.6	13.2	0.0	0.0	0.0	0.0	0.0	17.5	0.0	0.0	15.2	0.0	0.0	12.7	15.4	14.1	14.9
Asian	<20	0.0	13.5	19.2	0.0	19.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.5	0.0	0.0	0.0
Asian	20-24	8.4	4.9	8.2	5.7	6.8	7.9	6.6	9.2	14.3	10.8	9.7	9.1	11.6	4.8	10.1	14.0	10.8	11.6	7.1	7.5
Asian	25-29	8.1	9.0	6.6	6.0	7.1	9.2	10.7	8.1	12.9	9.8	8.1	8.7	11.4	7.9	13.9	11.9	10.6	4.4	6.9	5.2
Asian	30-34	7.3	6.5	6.7	9.0	7.9	9.5	14.5	9.4	11.3	9.8	10.0	9.1	7.4	9.2	11.0	12.6	11.0	9.1	9.9	7.9
Asian	35-39	8.0	8.8	6.7	7.5	10.6	10.1	11.3	7.7	12.9	7.8	10.4	10.0	8.0	8.9	6.9	7.8	9.9	7.4	6.8	9.5
Asian	40-44	7.1	5.3	4.2	8.5	8.8	5.4	5.8	8.7	11.4	8.7	9.6	4.9	9.9	5.3	7.9	9.7	8.5	6.0	4.6	7.2

		Period																			
Ethnicity name	Age Group	Jul-Dec 2008	Jan-Jun 2009	Jul-Dec 2009	Jan-Jun 2010	Jul-Dec 2010	Jan-Jun 2011	Jul-Dec 2011	Jan-Jun 2012	Jul-Dec 2012	Jan-Jun 2013	Jul-Dec 2013	Jan-Jun 2014	Jul-Dec 2014	Jan-Jun 2015	Jul-Dec 2015	Jan-Jun 2016	Jul-Dec 2016	Jan-Jun 2017	Jul-Dec 2017	Jan-Jun 2018
Asian	45-49	4.3	3.9	4.8	3.5	6.2	4.4	5.6	2.2	9.6	6.0	4.6	6.5	6.1	4.4	6.4	5.6	4.7	4.0	4.2	4.2
Asian	50-54	3.3	1.2	3.6	3.2	2.5	3.5	1.9	3.8	5.0	4.0	5.9	3.0	3.6	4.3	6.4	4.8	5.7	4.8	4.5	4.0
Asian	55-59	0.0	3.6	2.4	4.0	1.5	6.4	6.4	3.8	4.2	2.3	3.2	3.4	3.9	3.3	1.0	2.0	4.2	1.9	3.2	4.2
Asian	60-64	8.8	4.4	1.2	1.2	2.2	5.5	4.1	5.2	2.8	4.3	3.1	3.1	4.2	2.6	1.3	5.8	2.8	4.1	3.8	2.2
Asian	65-69	5.1	0.0	2.3	2.2	8.4	0.0	3.8	3.9	0.0	1.6	0.0	3.0	1.3	0.0	3.7	3.1	6.3	6.0	1.9	4.8
Asian	70+	12.5	0.0	10.5	0.0	0.0	0.0	0.0	0.0	10.8	9.5	28.6	0.0	0.0	9.4	8.4	0.0	0.0	0.0	0.0	7.4
European/ Other	<20	23.0	18.6	22.9	7.9	11.5	11.7	19.7	20.5	17.5	21.7	16.5	11.8	6.8	8.7	22.9	6.8	7.7	16.8	15.3	4.7
European/ Other	20-24	27.5	28.3	26.5	24.6	25.8	28.4	27.7	31.3	28.5	26.6	24.1	23.4	22.3	20.5	21.6	20.3	21.1	18.6	17.7	15.2
European/ Other	25-29	27.2	27.3	25.3	25.1	27.0	27.3	30.0	29.3	30.6	30.8	33.0	30.1	30.2	27.9	31.0	30.5	29.0	24.4	23.8	21.8
European/ Other	30-34	16.1	16.4	17.8	16.4	20.2	19.5	17.6	18.2	22.8	22.5	21.0	21.5	21.6	19.6	22.4	21.7	22.2	20.5	18.9	20.1
European/ Other	35-39	10.5	10.6	9.9	10.1	11.9	10.9	12.1	11.6	14.2	10.7	13.0	12.9	13.4	11.4	12.3	13.3	13.6	11.6	14.8	10.9
European/ Other	40-44	6.5	5.8	5.9	6.5	7.2	7.4	6.9	7.9	8.6	9.3	8.6	8.4	8.8	7.4	7.3	8.6	7.7	7.1	7.3	7.3
European/ Other	45-49	5.1	3.7	3.9	4.6	4.6	3.4	4.5	4.6	5.5	5.3	5.8	5.3	6.0	4.5	5.1	5.6	6.1	4.1	4.4	5.2
European/ Other	50-54	2.6	2.5	2.4	2.7	3.2	2.2	2.9	2.7	2.8	3.6	3.2	3.1	3.6	2.4	3.1	3.4	4.2	3.2	3.6	2.9
European/ Other	55-59	2.0	1.2	1.3	1.9	1.9	1.6	1.9	2.2	2.0	2.1	1.9	2.1	2.6	1.9	2.9	3.3	2.8	2.7	2.2	2.4
European/ Other	60-64	2.0	2.2	1.7	0.7	1.5	1.2	1.7	1.7	2.2	2.0	1.4	1.7	2.7	2.7	2.5	1.4	2.3	2.6	2.8	2.2
European/ Other	65-69	1.4	1.8	1.3	0.9	2.2	1.6	1.1	1.2	1.5	1.6	1.7	1.8	1.7	1.8	1.9	1.8	2.4	2.6	2.2	2.4
European/ Other	70+	2.1	4.9	2.4	2.6	5.0	3.8	2.0	3.0	1.7	7.9	5.1	1.8	3.6	1.8	4.5	7.6	2.6	4.3	5.5	6.2

Table 60 - Number of women screened, by age and ethnicity, July-Dec 2008 to Jan-Jun 2018

		Period																			
Ethnicity	Age Group	Jul-Dec 2008	Jan-Jun 2009	Jul-Dec 2009	Jan-Jun 2010	Jul-Dec 2010	Jan-Jun 2011	Jul-Dec 2011	Jan-Jun 2012	Jul-Dec 2012	Jan-Jun 2013	Jul-Dec 2013	Jan-Jun 2014	Jul-Dec 2014	Jan-Jun 2015	Jul-Dec 2015	Jan-Jun 2016	Jul-Dec 2016	Jan-Jun 2017	Jul-Dec 2017	Jan-Jun 2018
Māori	<20	635	606	434	464	359	348	290	297	246	204	150	150	137	139	127	131	97	96	69	93
Māori	20-24	4049	4306	4395	4548	4649	4743	4663	4478	4668	4501	4494	4393	4230	4371	4476	4321	3878	3900	3768	3961
Māori	25-29	3096	3354	3064	3288	3304	3460	3212	3265	3204	3256	3397	3355	3354	3485	3707	3720	3361	3446	3398	3699
Māori	30-34	3027	3220	2961	3050	3121	3120	3001	3002	2937	2726	2772	2783	2712	2909	2864	2982	2628	2645	2837	3192
Māori	35-39	3206	3113	3059	3144	3267	3148	3049	2836	2851	2697	2669	2689	2621	2713	2814	2694	2484	2494	2493	2767
Māori	40-44	2939	2828	2885	2838	2979	3098	3017	2946	3057	2846	2842	2727	2904	2880	2940	2704	2558	2570	2478	2746
Māori	45-49	2716	2665	2729	2765	2798	2764	2687	2656	2665	2521	2562	2629	2622	2734	2778	2717	2577	2526	2603	2857
Māori	50-54	1945	1844	2082	2015	2166	2193	2262	2214	2338	2315	2289	2368	2470	2378	2572	2403	2275	2253	2288	2431
Māori	55-59	1370	1213	1319	1389	1462	1513	1527	1548	1600	1573	1621	1711	1695	1844	1980	1902	1809	1856	2022	2148
Māori	60-64	856	818	902	874	1060	985	1010	1013	1088	1076	1097	1146	1188	1271	1289	1300	1314	1269	1327	1474
Māori	65-69	496	514	521	533	599	593	582	642	621	629	630	694	725	785	789	788	817	842	851	920
Māori	70+	118	118	117	129	135	117	125	134	134	116	113	150	124	132	127	111	144	129	128	137
Pacific	<20	181	173	138	134	108	126	90	94	50	60	36	47	40	36	27	26	25	19	18	12
Pacific	20-24	1463	1434	1474	1535	1721	1624	1673	1728	1540	1632	1648	1593	1521	1569	1576	1772	1458	1406	1392	1292
Pacific	25-29	1438	1446	1341	1476	1417	1372	1397	1473	1324	1443	1431	1468	1438	1534	1627	1679	1468	1410	1363	1432
Pacific	30-34	1530	1503	1400	1434	1525	1398	1441	1469	1281	1355	1308	1317	1331	1437	1457	1601	1275	1230	1288	1346
Pacific	35-39	1457	1472	1355	1383	1468	1402	1353	1345	1337	1254	1285	1306	1281	1371	1417	1522	1229	1277	1211	1310
Pacific	40-44	1460	1309	1322	1412	1468	1329	1328	1343	1277	1232	1358	1285	1285	1320	1429	1414	1243	1185	1098	1231
Pacific	45-49	1193	1151	1207	1206	1281	1203	1245	1224	1233	1218	1360	1299	1264	1384	1354	1383	1182	1221	1179	1209
Pacific	50-54	910	807	841	889	985	933	996	1056	980	991	1106	1029	1120	1146	1182	1193	1093	1183	1017	1067
Pacific	55-59	708	609	700	703	749	691	674	743	712	767	777	743	900	934	855	945	853	854	909	897
Pacific	60-64	418	426	484	477	530	481	521	573	562	585	622	603	607	677	657	703	673	635	668	648
Pacific	65-69	274	278	287	269	293	315	319	363	359	377	397	418	407	433	461	460	429	424	429	447
Pacific	70+	55	63	64	64	76	58	57	43	55	57	57	65	65	66	77	76	79	65	71	67
Asian	<20	80	74	52	61	51	55	39	42	35	26	31	26	21	34	26	25	16	22	20	21
Asian	20-24	1662	1625	1471	1590	1463	1392	1507	1528	1540	1580	1642	1643	1638	1669	1678	1712	1672	1725	1696	1742
Asian	25-29	2978	3205	3166	3312	3222	3246	3171	3322	3175	3154	3207	3087	3325	3543	3465	3794	3500	3616	3895	4039
Asian	30-34	2593	2764	2844	3009	3052	3145	3234	3518	3620	3887	4084	4159	4319	4905	4639	5017	4799	5140	5046	5339
Asian	35-39	2988	2856	2983	2922	2931	2977	2835	2969	2872	2948	3068	3104	3266	3698	3609	3862	3931	4165	4435	4727
Asian	40-44	2830	2804	2889	2834	2953	2941	2910	2972	2890	2991	3036	3051	3045	3232	3048	3303	3176	3170	3293	3332

		Period																			
Ethnicity	Age Group	Jul-Dec 2008	Jan-Jun 2009	Jul-Dec 2009	Jan-Jun 2010	Jul-Dec 2010	Jan-Jun 2011	Jul-Dec 2011	Jan-Jun 2012	Jul-Dec 2012	Jan-Jun 2013	Jul-Dec 2013	Jan-Jun 2014	Jul-Dec 2014	Jan-Jun 2015	Jul-Dec 2015	Jan-Jun 2016	Jul-Dec 2016	Jan-Jun 2017	Jul-Dec 2017	Jan-Jun 2018
Asian	45-49	2570	2546	2682	2599	2729	2702	2663	2709	2703	2675	2809	2773	2788	2957	2820	2863	2983	3027	3072	3067
Asian	50-54	1808	1719	1922	1850	1961	1974	2072	2095	2184	2234	2389	2305	2510	2577	2511	2509	2470	2475	2466	2513
Asian	55-59	1126	1122	1259	1259	1344	1405	1573	1566	1661	1707	1875	1780	2068	2105	2023	2006	2121	2055	2178	2137
Asian	60-64	685	684	803	849	906	916	972	954	1061	1152	1304	1272	1429	1539	1549	1563	1755	1704	1839	1785
Asian	65-69	395	394	435	454	478	499	526	517	568	639	713	660	766	885	814	968	951	1002	1035	1032
Asian	70+	80	86	95	93	103	87	100	98	93	105	105	110	112	106	119	93	127	133	134	136
Eur/Other	<20	1999	1994	1444	1517	1221	1287	1065	1022	856	829	666	676	584	574	524	592	392	476	392	424
Eur/Other	20-24	17847	18684	17865	18551	18846	18916	19222	18908	18719	18652	18609	18125	17975	18452	17886	18195	16418	16748	15909	16334
Eur/Other	25-29	15215	16606	14694	15797	14988	15228	15024	15312	14774	15206	15015	15231	15046	16038	15740	16352	14882	15792	14916	16344
Eur/Other	30-34	16868	17853	15773	16912	15822	15762	15441	15738	15031	15316	14806	14712	14459	15231	14621	15258	14248	14738	14268	16031
Eur/Other	35-39	20691	21710	19825	20191	19483	18782	18039	18041	16884	16666	15734	15638	14825	15547	14990	15309	14289	14416	13738	14934
Eur/Other	40-44	20557	20705	20015	20385	20443	19891	20319	19987	19562	18871	18950	18240	17988	18553	17472	16811	15924	15627	14585	15718
Eur/Other	45-49	20808	20278	20649	19993	20267	19137	19483	18693	18827	17820	17992	17103	17634	17692	17900	17415	16864	16788	16782	17495
Eur/Other	50-54	16642	16519	17099	16828	17609	16943	17855	17543	17743	17178	17783	16709	17338	17346	17361	16262	15916	15441	15518	15869
Eur/Other	55-59	13515	13102	13936	13579	13939	13427	14117	14007	14240	13613	14423	13902	14463	14476	15134	14461	14559	14662	14746	15338
Eur/Other	60-64	10822	10657	11443	11414	11652	11230	11949	11341	11607	11086	11699	11075	11874	11752	12001	11725	11565	11585	11871	12244
Eur/Other	65-69	7327	7196	7598	7632	7648	7393	7937	8173	8624	8580	9074	8931	9572	9757	9774	9575	9451	9299	9514	10042
Eur/Other	70+	2400	2250	2488	2338	2381	2356	2463	2358	2328	2159	2343	2191	2249	2165	2201	2230	2351	2351	2383	2584

Indicator 5.5 – Laboratory turnaround time

Table 61 - Timeliness of cytology reporting by laboratory, 1 January – 30 June 2018

	Laboratory turnaround time - cytology								
	Within 7 days		8-15 days		Total within 15 days		More than 15 days		Total
Laboratory	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Anatomical Pathology Services	44,846	97.7	960	2.1	45,806	99.8	111	0.2	45,917
Canterbury Health Laboratories	9,795	93.1	689	6.5	10,484	99.6	40	0.4	10,524
LabPLUS	7,449	89.3	735	8.8	8,184	98.2	154	1.8	8,338
Medlab Central Ltd.	11,274	70.9	4,394	27.6	15,668	98.5	234	1.5	15,902
Pathlab	27,779	98.7	321	1.1	28,100	99.9	42	0.1	28,142
Southern Community Laboratories	106,455	96.8	1,857	1.7	108,312	98.5	1,620	1.5	109,932
Total	**207,598**	**94.9**	**8,956**	**4.1**	**216,554**	**99.0**	**2,201**	**1.0**	**218,755**

Target: 90% within seven working days and 98% within 15 working days.

Note: total samples reported on for this Indicator is different from that reported in Indicator 5.1. Here, 'total samples' refers to all cytology samples received by laboratories within the monitoring period. Indicator 5.1 shows the total number of cytology samples taken during the period.

Table 62 - Timeliness of histology reporting by laboratory, 1 January – 30 June 2018

	Laboratory turnaround time - histology								
	Within 10 days		10-15 days		Total within 15 days		More than 15 days		Total
Laboratory	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Anatomical Pathology Services	1,456	96.7	31	2.1	1,487	98.7	19	1.3	1,506
Canterbury Health Laboratories	1,327	88.3	146	9.7	1,473	98.0	30	2.0	1,503
LabPLUS	527	70.4	108	14.4	635	84.8	114	15.2	749
Medlab Central Ltd.	779	95.2	8	1.0	787	96.2	31	3.8	818
Memorial Hospital Hastings Laboratory	53	85.5	2	3.2	55	88.7	7	11.3	62
Middlemore Hospital Laboratory	929	91.0	57	5.6	986	96.6	35	3.4	1,021
Nelson Hospital Laboratory	108	94.7	3	2.6	111	97.4	3	2.6	114
North Shore Hospital Laboratory	859	94.5	27	3.0	886	97.5	23	2.5	909
Northland Pathology Laboratory	223	85.8	24	9.2	247	95.0	13	5.0	260
Pathlab	945	83.6	143	12.7	1,088	96.3	42	3.7	1,130
Southern Community Laboratories Dunedin	2,768	99.4	4	0.1	2,772	99.6	12	0.4	2,784
Southern Community Laboratories Wellington	950	97.7	21	2.2	971	99.9	1	0.1	972
Taranaki Medlab	375	100.0	-	0.0	375	100.0	-	0.0	375
Waikato Hospital Laboratory	190	78.2	3	1.2	193	79.4	50	20.6	243
Total	**11,489**	**92.3**	**577**	**4.6**	**12,066**	**96.9**	**380**	**3.1**	**12,446**

Target: 90% within ten working days and 98% within 15 working days of receipt of the sample
Note: total histology samples reported on for this Indicator is different from that reported in Indicator 5.4. Indicator 5.5 includes all histology samples received by laboratories within the monitoring period, while 5.4 includes all histology samples taken within the monitoring period

Table 63 - Timeliness of reporting for cytology with associated HPV testing by laboratory, 1 January – 30 June 2018

	Laboratory turnaround time - cytology with HPV testing				
	Within 15 days		More than 15 days		Total
Laboratory	N	%	N	%	N
Anatomical Pathology Services	719	99.9	1	0.1	720
Canterbury Health Laboratories	183	99.5	1	0.5	184
LabPLUS	239	97.6	6	2.4	245
Medlab Central Ltd.	252	97.7	6	2.3	258
Pathlab	601	99.8	1	0.2	602
Southern Community Laboratories	1,049	99.5	5	0.5	1,054
Total	**3,043**	**99.3**	**20**	**0.7**	**3,063**

Indicator 6 – Follow-up of women with high-grade cytology

Table 64 - Women with a histology report within 90 days of a high-grade cytology report, by DHB and age

	<20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70+		Total
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Auckland	-	-	22	78.6	38	80.9	29	82.9	19	86.4	15	78.9	8	72.7	5	71.4	9	75.0	3	37.5	4	80.0	2	40.0	154
Bay of Plenty	-	-	10	83.3	19	95.0	11	78.6	7	77.8	5	100.0	4	50.0	5	100.0	1	50.0	2	100.0	2	66.7	4	100.0	70
Canterbury	-	-	34	91.9	46	88.5	27	93.1	16	84.2	12	100.0	15	93.8	9	75.0	7	87.5	4	66.7	2	100.0	2	50.0	174
Capital & Coast	-	-	15	100.0	14	82.4	10	71.4	11	78.6	5	100.0	3	100.0	4	50.0	3	75.0	1	25.0	3	100.0	-	-	69
Counties Manukau	-	-	13	68.4	25	92.6	27	71.1	18	78.3	12	100.0	6	66.7	7	77.8	5	83.3	2	50.0	3	42.9	-	-	118
Hawke's Bay	-	-	8	66.7	15	100.0	13	92.9	7	100.0	5	83.3	4	80.0	2	66.7	6	85.7	2	66.7	-	-	3	100.0	65
Hutt Valley	-	-	5	83.3	7	87.5	8	88.9	4	80.0	3	100.0	3	100.0	1	50.0	1	50.0	-	-	0	0.0	-	-	32
Lakes	-	-	1	100.0	8	100.0	6	100.0	6	100.0	1	33.3	2	66.7	2	100.0	4	80.0	1	50.0	2	100.0	1	100.0	34
Mid Central	-	-	17	77.3	8	88.9	13	100.0	10	90.9	6	100.0	3	100.0	3	100.0	-	-	1	50.0	1	100.0	0	0.0	62
Nelson Marlborough	-	-	8	100.0	12	100.0	10	100.0	6	85.7	11	100.0	1	25.0	4	100.0	4	100.0	2	66.7	4	80.0	-	-	62
Northland	1	100.0	2	100.0	3	100.0	13	100.0	8	88.9	4	80.0	1	33.3	1	50.0	2	28.6	1	50.0	0	0.0	-	-	36
South Canterbury	1	100.0	1	100.0	1	100.0	2	100.0	4	100.0	1	100.0	1	100.0	-	-	2	100.0	1	100.0	1	100.0	0	0.0	15
Southern	-	-	16	94.1	26	100.0	21	84.0	17	100.0	11	100.0	5	100.0	5	62.5	3	50.0	3	75.0	1	50.0	3	75.0	111
Tairawhiti	-	-	2	66.7	4	80.0	8	61.5	2	100.0	2	100.0	1	50.0	-	-	3	100.0	-	-	1	100.0	-	-	23
Taranaki	-	-	4	100.0	13	92.9	5	71.4	8	100.0	5	71.4	5	100.0	2	66.7	2	100.0	1	50.0	1	100.0	0	0.0	46
Waikato	-	-	24	100.0	19	86.4	32	94.1	15	93.8	11	91.7	10	90.9	7	77.8	7	63.6	4	50.0	2	66.7	3	60.0	134
Wairarapa	-	-	3	100.0	2	100.0	1	100.0	3	100.0	1	100.0	1	100.0	1	100.0	0	0.0	-	-	0	0.0	-	-	12
Waitemata	-	-	28	82.4	30	83.3	24	88.9	23	92.0	19	95.0	11	84.6	14	82.4	10	100.0	3	75.0	11	91.7	3	60.0	176
West Coast	-	-	2	100.0	1	100.0	1	50.0	-	-	1	100.0	2	66.7	1	100.0	0	0.0	-	-	-	-	-	-	8
Whanganui	-	-	5	100.0	4	80.0	9	100.0	5	100.0	1	50.0	1	100.0	2	100.0	2	100.0	2	100.0	1	100.0	0	0.0	32
Total	**2**	**100.0**	**220**	**86.3**	**295**	**89.4**	**270**	**85.7**	**189**	**89.2**	**131**	**91.0**	**87**	**79.1**	**75**	**76.5**	**71**	**74.7**	**33**	**57.9**	**39**	**75.0**	**21**	**58.3**	**1,433**

'– ' indicates there were no women in this sub-category with a high -grade cytology report

Table 65 - Women with a histology report within 180 days of a high-grade cytology report, by DHB and age

	<20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70+		Total
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Auckland	-	-	25	89.3	40	85.1	32	91.4	19	86.4	16	84.2	10	90.9	6	85.7	10	83.3	4	50.0	4	80.0	3	60.0	169
Bay of Plenty	-	-	10	83.3	20	100.0	12	85.7	7	77.8	5	100.0	5	62.5	5	100.0	1	50.0	2	100.0	2	66.7	4	100.0	73
Canterbury	-	-	35	94.6	47	90.4	27	93.1	17	89.5	12	100.0	16	100.0	10	83.3	7	87.5	6	100.0	2	100.0	3	75.0	182
Capital & Coast	-	-	15	100.0	15	88.2	10	71.4	14	100.0	5	100.0	3	100.0	5	62.5	3	75.0	2	50.0	3	100.0	-	-	75
Counties Manukau	-	-	15	78.9	26	96.3	30	78.9	18	78.3	12	100.0	6	66.7	7	77.8	5	83.3	2	50.0	5	71.4	-	-	126
Hawke's Bay	-	-	11	91.7	15	100.0	14	100.0	7	100.0	5	83.3	4	80.0	2	66.7	6	85.7	2	66.7	-	-	3	100.0	69
Hutt Valley	-	-	6	100.0	7	87.5	9	100.0	4	80.0	3	100.0	3	100.0	1	50.0	1	50.0	-	-	1	100.0	-	-	35
Lakes	-	-	1	100.0	8	100.0	6	100.0	6	100.0	2	66.7	3	100.0	2	100.0	4	80.0	1	50.0	2	100.0	1	100.0	36
Mid Central	-	-	18	81.8	8	88.9	13	100.0	11	100.0	6	100.0	3	100.0	3	100.0	-	-	2	100.0	1	100.0	1	100.0	66
Nelson	-	-	8	100.0	12	100.0	10	100.0	6	85.7	11	100.0	3	75.0	4	100.0	4	100.0	2	66.7	4	80.0	-	-	64
Marlborough																									
Northland	1	100.0	2	100.0	3	100.0	13	100.0	9	100.0	4	80.0	1	33.3	1	50.0	4	57.1	2	100.0	1	100.0	-	-	41
South Canterbury	1	100.0	1	100.0	1	100.0	2	100.0	4	100.0	1	100.0	1	100.0	-	-	2	100.0	1	100.0	1	100.0	0	0.0	15
Southern	-	-	16	94.1	26	100.0	23	92.0	17	100.0	11	100.0	5	100.0	7	87.5	4	66.7	3	75.0	1	50.0	3	75.0	116
Tairawhiti	-	-	3	100.0	4	80.0	10	76.9	2	100.0	2	100.0	2	100.0	-	-	3	100.0	-	-	1	100.0	-	-	27
Taranaki	-	-	4	100.0	13	92.9	6	85.7	8	100.0	5	71.4	5	100.0	2	66.7	2	100.0	2	100.0	1	100.0	2	100.0	50
Waikato	-	-	24	100.0	19	86.4	32	94.1	15	93.8	12	100.0	10	90.9	7	77.8	7	63.6	5	62.5	2	66.7	4	80.0	137
Wairarapa	-	-	3	100.0	2	100.0	1	100.0	3	100.0	1	100.0	1	100.0	1	100.0	0	0.0	-	-	1	100.0	-	-	13
Waitemata	-	-	28	82.4	33	91.7	25	92.6	23	92.0	19	95.0	11	84.6	15	88.2	10	100.0	4	100.0	11	91.7	4	80.0	183
West Coast	-	-	2	100.0	1	100.0	1	50.0	-	-	1	100.0	2	66.7	1	100.0	1	100.0	-	-	-	-	-	-	9
Whanganui	-	-	5	100.0	4	80.0	9	100.0	5	100.0	2	100.0	1	100.0	2	100.0	2	100.0	2	100.0	1	100.0	1	100.0	34
Total	**2**	**100.0**	**232**	**91.0**	**304**	**92.1**	**285**	**90.5**	**195**	**92.0**	**135**	**93.8**	**95**	**86.4**	**81**	**82.7**	**76**	**80.0**	**42**	**73.7**	**44**	**84.6**	**29**	**80.6**	**1,520**

' – ' indicates there were no women in this sub-category with a high-grade cytology report

Indicator 7 – Colposcopy indicators

Indicator 7.1 – Timeliness of colposcopic assessment – high-grade cytology

Table 66 - Women with high -grade cytology (including cytological suspicion of invasive disease), by DHB

DHB	HG women	HG women with referral recorded on the NCSP Register
	N	N
Auckland	147	131
Bay of Plenty	68	64
Canterbury	169	161
Capital & Coast	78	71
Counties Manukau	130	124
Hawke's Bay	68	64
Hutt Valley	38	36
Lakes	40	39
Mid Central	75	74
Nelson Marlborough	61	56
Northland	42	38
South Canterbury	14	13
Southern	102	96
Tairawhiti	28	25
Taranaki	45	45
Waikato	132	126
Wairarapa	13	12
Waitemata	152	145
West Coast	12	12
Whanganui	30	30
Private practice	*262*	*177*
Total	**1,706**	**1,539**

Table 67 - Women with a high -grade cytology report (no suspicion of invasive disease), accepted referral and a colposcopy visit within 20 and 40 working days, by ethnicity

Ethnicity	HG women	Accepted referrals recorded on NCSP Register	Women seen within 20 working days		Women seen within 40 working days	
	N	N	N	%	N	%
Māori	264	246	172	69.9	216	87.8
Pacific	83	73	49	67.1	60	82.2
Asian	162	146	114	78.1	133	91.1
European/ Other	1,154	1,044	807	77.3	972	93.1
Total	**1,663**	**1,509**	**1,142**	**75.7**	**1,381**	**91.5**

Table 68 - Women with a high-grade cytology report (no suspicion of invasive disease), accepted referral and a colposcopy visit within 20 and 40 working days, by DHB

DHB	HG women	Accepted referrals recorded on NCSP Register	Women seen within 20 working days		Women seen within 40 working days	
	N	N	N	%	N	%
Public clinics overall	*1,407*	*1,334*	*1,036*	*77.7*	*1,253*	*93.9*
Auckland	144	131	107	81.7	122	93.1
Bay of Plenty	64	60	52	86.7	55	91.7
Canterbury	165	159	119	74.8	153	96.2
Capital & Coast	75	71	60	84.5	67	94.4
Counties Manukau	130	124	96	77.4	115	92.7
Hawke's Bay	66	62	33	53.2	55	88.7
Hutt Valley	38	36	31	86.1	35	97.2
Lakes	38	37	21	56.8	36	97.3
Mid Central	74	73	59	80.8	70	95.9
Nelson Marlborough	60	55	34	61.8	52	94.5
Northland	41	37	34	91.9	37	100.0
South Canterbury	12	11	10	90.9	10	90.9
Southern	101	95	69	72.6	91	95.8
Tairawhiti	28	25	18	72.0	21	84.0
Taranaki	45	45	34	75.6	41	91.1
Waikato	127	121	113	93.4	118	97.5
Wairarapa	13	12	12	100.0	12	100.0
Waitemata	145	139	103	74.1	126	90.6
West Coast	12	12	4	33.3	8	66.7
Whanganui	29	29	27	93.1	29	100.0
Private Practice	*256*	*175*	*106*	*60.6*	*128*	*73.1*
Total	**1,663**	**1,509**	**1,142**	**75.7**	**1,381**	**91.5**

Table 69 - Women with cytological suspicion of invasive disease, by cytology result subcategory

Cytology result sub-category	Total women	Accepted referrals recorded on NCSP Register*
	N	N
HS2	12	10
SC	11	10
AC1-AC5	14	5
R10, R14	6	5
Total	**43**	**30**

** Referral accepted date no later than four weeks prior to the end of the current monitoring period, in order to allow at least four weeks of follow-up time available.*

Indicator 7.2 – Timeliness of colposcopic assessment – low-grade cytology

Table 70 - Follow-up of women with persistent low -grade cytology/ low -grade cytology and positive hrHPV test, by DHB

DHB	LG women	Women with subsequent referral recorded		Women with subsequent colposcopy visit recorded		Women with colposcopy subsequent to referral recorded		Women with colposcopy subsequent to referral recorded AND referral:colposcopy interval <= 26 weeks	
	N	N	%*	N	% *	N	% †	N	% †
Auckland	403	368	91.3	359	89.1	354	96.2	335	91.0
Bay of Plenty	229	206	90.0	210	91.7	198	96.1	168	81.6
Canterbury	288	278	96.5	274	95.1	272	97.8	269	96.8
Capital & Coast	130	121	93.1	115	88.5	113	93.4	105	86.8
Counties Manukau	291	275	94.5	259	89.0	251	91.3	247	89.8
Hawke's Bay	73	64	87.7	64	87.7	61	95.3	36	56.3
Hutt Valley	63	59	93.7	57	90.5	57	96.6	55	93.2
Lakes	77	73	94.8	72	93.5	71	97.3	60	82.2
Mid Central	124	116	93.5	116	93.5	113	97.4	110	94.8
Nelson Marlborough	59	56	94.9	57	96.6	55	98.2	39	69.6
Northland	72	66	91.7	63	87.5	62	93.9	57	86.4
South Canterbury	15	12	80.0	10	66.7	9	75.0	9	75.0
Southern	132	122	92.4	121	91.7	116	95.1	107	87.7
Tairawhiti	51	43	84.3	41	80.4	38	88.4	38	88.4
Taranaki	44	42	95.5	43	97.7	42	100.0	41	97.6
Waikato	313	302	96.5	286	91.4	283	93.7	267	88.4
Wairarapa	21	19	90.5	19	90.5	17	89.5	17	89.5
Waitemata	397	381	96.0	364	91.7	357	93.7	353	92.7
West Coast	26	25	96.2	24	92.3	23	92.0	23	92.0
Whanganui	49	49	100.0	48	98.0	48	98.0	48	98.0
Private practice	*631*	*340*	*53.9*	*596*	*94.5*	*305*	*89.7*	*295*	*86.8*
Total	**3,488**	**3,017**	**86.5**	**3,198**	**91.7**	**2,845**	**94.3**	**2,679**	**88.8**

LG women = women with persistent LG/ who are LG & hrHPV positive

** Percentage of women with persistent LG/ who are LG & hrHPV positive; † percentage of women with a referral*

Table 71 - Follow-up of women with persistent low -grade cytology/ low-grade cytology and positive hrHPV test, by ethnicity

Ethnicity	LG women	Women with subsequent referral recorded		Women with subsequent colposcopy visit recorded		Women with colposcopy subsequent to referral recorded		Women with colposcopy subsequent to referral recorded AND referral: colposcopy interval <= 26 weeks	
	N	N	%*	N	% *	N	% †	N	% †
Māori	363	337	92.8	322	88.7	308	91.4	278	82.5
Pacific	156	143	91.7	134	85.9	127	88.8	123	86.0
Asian	414	352	85.0	377	91.1	330	93.8	309	87.8
European/ Other	2,555	2,185	85.5	2,365	92.6	2,080	95.2	1,969	90.1
Total	**3,488**	**3,017**	**86.5**	**3,198**	**91.7**	**2,845**	**94.3**	**2,679**	**88.8**

LG women = women with persistent LG/ who are LG & hrHPV positive

** Percentage of women with persistent LG/ who are LG & hrHPV positive; † percentage of women with a referral*

Indicator 7.3 – Adequacy of documenting colposcopic assessment

Table 72 - Completion of colposcopic assessment fields, by DHB

DHB	Total colposcopies N	% of colposcopies performed where items are completed					
		SCJ visibility[(i)]	Presence/ absence lesion[(ii)]	Opinion re abnormality grade[(iii)]	Follow-up type	Follow-up timeframe	Items i, ii, & iii complete
Public clinics overall	*10,789*	*97.4*	*100.0*	*91.7*	*95.8*	*95.3*	*92.7*
Auckland	918	98.3	100.0	92.6	98.7	98.4	93.6
Bay of Plenty	646	96.7	100.0	89.3	90.6	89.9	89.6
Canterbury	1,653	97.4	100.0	92.7	96.9	96.7	92.8
Capital & Coast	711	99.9	100.0	92.3	94.0	93.4	96.2
Counties Manukau	930	96.6	100.0	93.3	99.0	98.5	92.3
Hawke's Bay	329	97.9	100.0	92.4	97.3	97.0	93.6
Hutt Valley	256	99.2	100.0	98.9	96.1	96.1	98.4
Lakes	296	98.0	100.0	89.7	94.6	94.6	91.2
Mid Central	543	95.0	100.0	89.5	98.3	98.2	90.1
Nelson Marlborough	325	98.5	100.0	91.8	94.5	93.8	92.9
Northland	363	97.2	100.0	85.6	98.6	98.1	91.5
South Canterbury	123	97.6	100.0	84.2	95.1	95.1	91.1
Southern	702	96.9	100.0	88.1	96.6	96.3	90.3
Tairawhiti	161	98.8	100.0	94.7	96.9	96.3	97.5
Taranaki	389	96.1	100.0	88.8	99.7	99.7	90.2
Waikato	859	98.4	100.0	96.5	99.1	97.6	96.4
Wairarapa	73	98.6	100.0	89.7	97.3	97.3	93.2
Waitemata	1,222	96.6	100.0	91.1	86.7	85.3	92.5
West Coast	89	94.4	100.0	88.4	98.9	98.9	86.5
Whanganui	201	95.0	100.0	90.8	100.0	100.0	89.1
Private practice	*1,409*	*96.7*	*100.0*	*90.9*	*94.4*	*91.8*	*91.3*
Total	**12,198**	**97.3**	**100.0**	**91.6**	**95.6**	**94.9**	**92.6**

Table 73 - Summary of colposcopic appearance findings, by DHB

DHB	Total colposcopies N	SCJ visible* N	Colposcopic appearance (as % of colposcopies where items are completed) Abnormal	Inconclusive
Public clinics overall	*10,789*	*10,505*	*53.9*	*4.8*
Auckland	918	902	58.5	4.7
Bay of Plenty	646	625	60.7	7.3
Canterbury	1,653	1,610	60.3	4.8
Capital & Coast	711	710	43.7	3.7
Counties Manukau	930	898	59.6	4.3
Hawke's Bay	329	322	52.0	4.3
Hutt Valley	256	254	67.6	0.8
Lakes	296	290	59.1	6.8
Mid Central	543	516	43.8	5.2
Nelson Marlborough	325	320	65.5	5.8
Northland	363	353	36.1	6.1
South Canterbury	123	120	39.0	7.3
Southern	702	680	52.7	7.1
Tairawhiti	161	159	44.7	2.5
Taranaki	389	374	47.0	5.9
Waikato	859	845	53.9	2.0
Wairarapa	73	72	47.9	5.5
Waitemata	1,222	1,180	46.8	4.6
West Coast	89	84	68.5	9.0
Whanganui	201	191	58.7	6.0
Private practice	1,409	*1,363*	*54.6*	*5.5*
Total	**12,198**	**11,868**	**54.0**	**4.9**

** Field has been completed*

Table 74 - Biopsies by colposcopic appearance and DHB

DHB	Colposcopic appearance								
	Abnormal			Inconclusive			Normal		
	Total	Biopsy taken		Total	Biopsy taken		Total	Biopsy taken	
	N	N	%	N	N	%	N	N	%
Public clinics overall	*5,813*	*5,397*	*92.8*	*523*	*156*	*29.8*	*4,453*	*842*	*18.9*
Auckland	537	462	86.0	43	17	39.5	338	42	12.4
Bay of Plenty	392	361	92.1	47	10	21.3	207	22	10.6
Canterbury	996	938	94.2	79	29	36.7	578	136	23.5
Capital & Coast	311	293	94.2	26	4	15.4	374	118	31.6
Counties Manukau	554	522	94.2	40	11	27.5	336	47	14.0
Hawke's Bay	171	157	91.8	14	2	14.3	144	22	15.3
Hutt Valley	173	157	90.8	2	1	50.0	81	10	12.3
Lakes	175	158	90.3	20	5	25.0	101	11	10.9
Mid Central	238	222	93.3	28	9	32.1	277	67	24.2
Nelson Marlborough	213	205	96.2	19	9	47.4	93	28	30.1
Northland	131	123	93.9	22	3	13.6	210	39	18.6
South Canterbury	48	46	95.8	9	3	33.3	66	10	15.2
Southern	370	353	95.4	50	18	36.0	282	83	29.4
Tairawhiti	72	67	93.1	4	0	0.0	85	22	25.9
Taranaki	183	166	90.7	23	7	30.4	183	27	14.8
Waikato	463	443	95.7	17	1	5.9	379	49	12.9
Wairarapa	35	33	94.3	4	2	50.0	34	13	38.2
Waitemata	572	519	90.7	56	14	25.0	594	82	13.8
West Coast	61	58	95.1	8	2	25.0	20	4	20.0
Whanganui	118	114	96.6	12	9	75.0	71	10	14.1
Private practice	*770*	*657*	*85.3*	*77*	*46*	*59.7*	*562*	*121*	*21.5*
Total	**6,583**	**6,054**	**92.0**	**600**	**202**	**33.7**	**5,015**	**963**	**19.2**

Indicator 7.5 – Timely discharge of women after treatment

Table 75 - Follow-up of treated women with colposcopy and cytology in the period up to nine months post-treatment, and discharge of eligible women

DHB	Total treatments N	Eligible for discharge* N	Eligible for discharge* % of women treated	Women discharged appropriately N	Women discharged appropriately % of eligible
Auckland	126	81	64.3	69	85.2
Bay of Plenty	63	43	68.3	38	88.4
Canterbury	181	136	75.1	104	76.5
Capital & Coast	45	39	86.7	36	92.3
Counties Manukau	153	100	65.4	94	94.0
Hawke's Bay	56	41	73.2	39	95.1
Hutt Valley	23	20	87.0	19	95.0
Lakes	38	33	86.8	27	81.8
Mid Central	83	56	67.5	49	87.5
Nelson Marlborough	37	27	73.0	26	96.3
Northland	54	37	68.5	30	81.1
South Canterbury	9	8	88.9	3	37.5
Southern	69	61	88.4	54	88.5
Tairawhiti	24	21	87.5	19	90.5
Taranaki	39	31	79.5	25	80.6
Waikato	117	94	80.3	91	96.8
Wairarapa	7	5	71.4	5	100.0
Waitemata	126	89	70.6	74	83.1
West Coast	16	13	81.3	13	100.0
Whanganui	34	21	61.8	20	95.2
Private Practice	*92*	*65*	*70.7*	*44*	*67.7*
Total	**1,392**	**1,021**	**73.3**	**879**	**86.1**

** Based on advice from the NCSP Advisory Group, women were defined as eligible for discharge if they had a cytology test following their treatment, and their cytology result was negative*

Table 76 - Follow-up of treated women in the period up to nine months post-treatment

DHB	Total treatments	Colposcopy within 9 months post-treatment		Colposcopy & cytology within 9 months post-treatment	
	N	N	%	N	%
Auckland	126	106	84.1	106	84.1
Bay of Plenty	63	27	42.9	24	38.1
Canterbury	181	142	78.5	140	77.3
Capital & Coast	45	39	86.7	39	86.7
Counties Manukau	153	112	73.2	111	72.5
Hawke's Bay	56	35	62.5	33	58.9
Hutt Valley	23	18	78.3	18	78.3
Lakes	38	26	68.4	25	65.8
Mid Central	83	67	80.7	66	79.5
Nelson Marlborough	37	30	81.1	30	81.1
Northland	54	47	87.0	45	83.3
South Canterbury	9	3	33.3	3	33.3
Southern	69	59	85.5	59	85.5
Tairawhiti	24	18	75.0	17	70.8
Taranaki	39	32	82.1	32	82.1
Waikato	117	98	83.8	98	83.8
Wairarapa	7	7	100.0	7	100.0
Waitemata	126	112	88.9	112	88.9
West Coast	16	11	68.8	11	68.8
Whanganui	34	29	85.3	27	79.4
Private practice	*92*	*61*	*66.3*	*60*	*65.2*
Total	**1,392**	**1,079**	**77.5**	**1,063**	**76.4**

Indicator 8 – HPV tests

Indicator 8.1 – Triage of low-grade cytology

Table 77 - Triage testing of women with ASC-US cytology

	Total ASC-US results		Women with an HPV test			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
Laboratory	**N**	**N**	**N**	**%**	**N**	**%**
Anatomical Pathology Services	185	355	4	2.2	354	99.7
Canterbury Health Laboratories	34	113	1	2.9	111	98.2
LabPLUS	71	178	0	0.0	171	96.1
Medlab Central Ltd.	94	178	1	1.1	155	87.1
Pathlab	123	298	0	0.0	294	98.7
Southern Community Laboratories	201	458	1	0.5	452	98.7
Total	**708**	**1,580**	**7**	**1.0**	**1,537**	**97.3**

** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the cytology test*

Table 78 - Triage testing of women with LSIL cytology

	Total LSIL results		Women with an HPV test			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
Laboratory	**N**	**N**	**N**	**%**	**N**	**%**
Anatomical Pathology Services	537	372	2	0.4	369	99.2
Canterbury Health Laboratories	122	73	0	0.0	70	95.9
LabPLUS	103	67	1	1.0	65	97.0
Medlab Central Ltd.	150	112	0	0.0	97	86.6
Pathlab	370	315	1	0.3	313	99.4
Southern Community Laboratories	1,129	655	11	1.0	627	95.7
Total	**2,411**	**1,594**	**15**	**0.6**	**1,541**	**96.7**

** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the cytology test*

Table 79 - Histological outcomes within 12 months in women with ASC-US cytology and positive HPV triage test

Laboratory	**Women with ASC-US cytology & positive HPV triage test**	**Triage-positive women who attended colposcopy**		**Triage-positive women with histology recorded**		**Triage-positive women with CIN 2+ histology**		
	N	**N**	**%***	**N**	**%***	**N**	**%†**	**%‡**
Anatomical Pathology Services	85	82	96.5	54	63.5	10	12.2	18.5
Canterbury Health Laboratories	24	23	95.8	19	79.2	6	26.1	31.6
LabPLUS	18	16	88.9	10	55.6	1	6.3	10.0
Medlab Central Ltd.	30	28	93.3	20	66.7	6	21.4	30.0
Pathlab	87	86	98.9	56	64.4	14	16.3	25.0
Southern Community Laboratories	85	79	92.9	50	58.8	11	13.9	22.0
Total	**329**	**314**	**95.4**	**209**	**63.5**	**48**	**15.3**	**23.0**

** % of women with ASC-US cytology and positive triage test † expressed as a percentage of women with colposcopy ‡ expressed as a percentage of women with histology. Results are for ASC-US cytology collected in the 6-month period 12 months prior to the current monitoring period (i.e. in 1 July – 31 December 2016), to allow for sufficient follow-up time for colposcopy/ histology.*

Table 80 - Histological outcomes within 12 months in women with LSIL cytology and positive HPV triage test

Laboratory	Women with LSIL cytology & positive HPV triage test	Triage -positive women who attended colposcopy		Triage -positive women with histology recorded		Triage -positive women with CIN 2+ histology		
	N	N	%*	N	%*	N	%†	%‡
Anatomical Pathology Services	235	214	91.1	157	66.8	19	8.9	12.1
Canterbury Health Laboratories	26	24	92.3	19	73.1	4	16.7	21.1
LabPLUS	23	20	87.0	17	73.9	3	15.0	17.6
Medlab Central Ltd.	40	37	92.5	22	55.0	4	10.8	18.2
Pathlab	121	110	90.9	71	58.7	19	17.3	26.8
Southern Community Laboratories	351	323	92.0	247	70.4	54	16.7	21.9
Total	**796**	**728**	**91.5**	**533**	**67.0**	**103**	**14.1**	**19.3**

** % of women with LSIL cytology and positive triage test † expressed as a percentage of women with colposcopy ‡ expressed as a percentage of women with histology. Results are for ASC-US cytology collected in the 6-month period 12 months prior to the current monitoring period (i.e. in 1 July – 31 December 2016), to allow for sufficient follow-up time for colposcopy/ histology.*

Indicator 8.2 – HPV test volumes

Table 81 - Volume of HPV test samples received during the monitoring period, by laboratory

Laboratory	HPV tests received		Ratio HPV tests: smears received (%)
	N	% of national total	
Anatomical Pathology Services	4,110	22.5	9.0
Canterbury Health Laboratories	1,326	7.2	12.6
LabPLUS	798	4.4	9.6
Medlab Central Ltd.	1,588	8.7	10.0
Pathlab	2,565	14.0	9.1
Southern Community Laboratories	7,915	43.2	7.2
Total	**18,302**	**100.0**	**8.4**

Table 82 - Invalid HPV tests, by laboratory

Laboratory	Total	Valid		Invalid	
	N	N	%	N	%
Anatomical Pathology Services	4,110	4,107	99.9	3	0.07
Canterbury Health Laboratories	1,326	1,324	99.8	2	0.15
LabPLUS	798	797	99.9	1	0.13
Medlab Central Ltd.	1,588	1,587	99.9	1	0.06
Pathlab	2,565	2,560	99.8	5	0.19
Southern Community Laboratories	7,915	7,914	100.0	1	0.01
Total	**18,302**	**18,289**	**99.9**	**13**	**0.07**

Table 83 - Validity of HPV triage tests, by test technology

Test technology	Total HPV tests		Valid		Invalid	
	N	%	N	%	N	%
Abbott RealTime	9,241	*50.5*	9,238	100.0	3	0.03
Roche COBAS4800	7,302	*39.9*	7,297	99.9	5	0.07
BD Onclarity	1,759	*9.6*	1,754	99.7	5	0.28
Total	**18,302**	***100.0***	**18,289**	**99.9**	**13**	**0.07**

Table 84 - Volume of HPV test samples received during the monitoring period, by purpose and ethnicity

	Post-treatment		Historical		Taken at colposcopy		HPV triage		Other		Total
Ethnicity	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Māori	400	15.0	1,117	42.0	156	5.9	333	12.5	655	24.6	2,661
Pacific	90	14.1	226	35.4	39	6.1	158	24.8	125	19.6	638
Asian	255	17.5	368	25.2	123	8.4	438	30.0	274	18.8	1,458
European/ Other	1,949	14.4	4,990	36.8	1,070	7.9	1,949	14.4	3,587	26.5	13,545
Total	**2,694**	**14.7**	**6,701**	**36.6**	**1,388**	**7.6**	**2,878**	**15.7**	**4,641**	**25.4**	**18,302**

Table 85 - Volume of HPV test samples received during the monitoring period, by purpose and age

	Post-treatment		Historical		Taken at colposcopy		HPV triage		Other		Total
Age	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
<20	1	14.3	-	-	3	42.9	-	0.0	3	42.9	7
20-24	184	25.9	55	7.7	197	27.7	-	0.0	274	38.6	710
25-29	612	33.1	648	35.0	168	9.1	-	0.0	422	22.8	1,850
30-34	626	20.7	1,068	35.3	186	6.1	628	20.8	517	17.1	3,025
35-39	426	17.3	1,014	41.1	143	5.8	497	20.1	387	15.7	2,467
40-44	293	12.9	996	44.0	136	6.0	425	18.8	415	18.3	2,265
45-49	211	9.0	1,014	43.5	116	5.0	447	19.2	544	23.3	2,332
50-54	131	6.9	709	37.6	139	7.4	318	16.9	589	31.2	1,886
55-59	90	5.7	545	34.8	119	7.6	256	16.3	556	35.5	1,566
60-64	59	5.5	342	31.7	88	8.2	165	15.3	424	39.3	1,078
65-69	40	4.9	216	26.5	60	7.4	110	13.5	389	47.7	815
70+	21	7.0	94	31.2	33	11.0	32	10.6	121	40.2	301
Total	**2,694**	**14.7**	**6,701**	**36.6**	**1,388**	**7.6**	**2,878**	**15.7**	**4,641**	**25.4**	**18,302**

Table 86 - Volume of HPV test samples received during the monitoring period, by purpose and laboratory

	Post-treatment		Historical		Taken at colposcopy		HPV triage		Other		Total
Laboratory	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Anatomical Pathology Services	566	13.8	1,771	43.1	109	2.7	702	17.1	962	23.4	4,110
Canterbury Health Laboratories	330	24.9	347	26.2	280	21.1	169	12.7	200	15.1	1,326
LabPLUS	117	14.7	166	20.8	183	22.9	225	28.2	107	13.4	798
Medlab Central Ltd.	304	19.1	596	37.5	63	4.0	242	15.2	383	24.1	1,588
Pathlab	305	11.9	1,089	42.5	255	9.9	550	21.4	366	14.3	2,565
Southern Community Laboratories	1,072	13.5	2,732	34.5	498	6.3	990	12.5	2,623	33.1	7,915
Total	**2,694**	**14.7**	**6,701**	**36.6**	**1,388**	**7.6**	**2,878**	**15.7**	**4,641**	**25.4**	**18,302**

Table 87 - HPV test samples collected at colposcopy, in relation to total colposcopies performed in the period, by DHB

Laboratory	HPV tests N	Colposcopies N	HPV tests / colposcopies %
Public clinics overall	*1,009*	*10,789*	*9.4*
Auckland	21	918	2.3
Bay of Plenty	128	646	19.8
Canterbury	186	1,653	11.3
Capital & Coast	57	711	8.0
Counties Manukau	70	930	7.5
Hawke's Bay	37	329	11.2
Hutt Valley	21	256	8.2
Lakes	90	296	30.4
Mid Central	16	543	2.9
Nelson Marlborough	36	325	11.1
Northland	29	363	8.0
South Canterbury	33	123	26.8
Southern	57	702	8.1
Tairawhiti	-	161	-
Taranaki	36	389	9.3
Waikato	96	859	11.2
Wairarapa	15	73	20.5
Waitemata	59	1,222	4.8
West Coast	6	89	6.7
Whanganui	16	201	8.0
Private practice	163	1,409	11.6
Total	**1,172**	**12,198**	**9.6**

HPV tests/ colposcopy can be interpreted broadly as the percentage of colposcopies within this DHB/ sector where a sample is collected for HPV testing. Consistent with the count of colposcopies column, the number of HPV tests here includes only HPV test samples where a colposcopy report record exists.

Indicator 8.3 –HPV tests for follow-up of women with a historical high-grade abnormality

Table 88 - Women eligible for and proportion who have received HPV testing for a historical high-grade abnormality, by age at 30 June 2018

Age group	Number of women eligible for testing as at 1 Oct 2009		Round 1 test recorded		Round 2 test recorded	
	All	In current report*	N	%	N	%
<20	-	-	-	0.0	-	0.0
20-24	-	-	-	0.0	-	0.0
25-29	37	37	16	43.2	14	37.8
30-34	1,646	1,634	1,063	65.1	831	50.9
35-39	5,907	5,865	3,903	66.5	3,241	55.3
40-44	9,405	9,331	6,491	69.6	5,432	58.2
45-49	10,890	10,772	7,586	70.4	6,385	59.3
50-54	8,060	7,925	5,558	70.1	4,691	59.2
55-59	5,967	5,790	4,056	70.1	3,448	59.6
60-64	3,653	3,528	2,506	71.0	2,155	61.1
65-69	2,178	2,037	1,397	68.6	1,204	59.1
70+	2,760	2,274	896	39.4	701	30.8
Total	**50,503**	**49,193**	**33,472**	**68.0**	**28,102**	**57.1**

** Women are not followed up in the current report if they are no longer alive at the end of the current monitoring period; or if they have since had a non-squamous high -grade abnormality (no longer eligible for HPV testing to follow-up historical high -grade abnormality).*

Table 89 - Women eligible for and proportion who have received historical HPV testing, by DHB

DHB	Number of women eligible for historical testing as at 1 Oct 2009		Round 1 test recorded		Round 2 test recorded	
	All	In current report*	N	%	N	%
Auckland	3,986	3,919	2,247	57.3	1,756	44.8
Bay of Plenty	3,025	2,937	2,076	70.7	1,673	57.0
Canterbury	6,018	5,879	4,048	68.9	3,553	60.4
Capital & Coast	2,804	2,761	1,876	67.9	1,663	60.2
Counties Manukau	3,535	3,432	1,932	56.3	1,493	43.5
Hawke's Bay	2,240	2,172	1,576	72.6	1,346	62.0
Hutt Valley	1,537	1,497	1,029	68.7	885	59.1
Lakes	1,612	1,573	973	61.9	765	48.6
Mid Central	2,242	2,172	1,624	74.8	1,433	66.0
Nelson Marlborough	1,902	1,849	1,475	79.8	1,340	72.5
Northland	1,925	1,852	1,155	62.4	881	47.6
South Canterbury	844	818	617	75.4	544	66.5
Southern	4,765	4,658	3,349	71.9	2,906	62.4
Tairawhiti	910	876	568	64.8	467	53.3
Taranaki	2,220	2,145	1,591	74.2	1,414	65.9
Waikato	4,029	3,921	2,920	74.5	2,512	64.1
Wairarapa	514	500	332	66.4	284	56.8
Waitemata	5,128	5,008	3,197	63.8	2,452	49.0
West Coast	433	425	337	79.3	300	70.6
Whanganui	822	789	550	69.7	435	55.1
Unspecified	*12*	*10*	-	*0.0*	-	*0.0*
Total	**50,503**	**49,193**	**33,472**	**68.0**	**28,102**	**57.1**

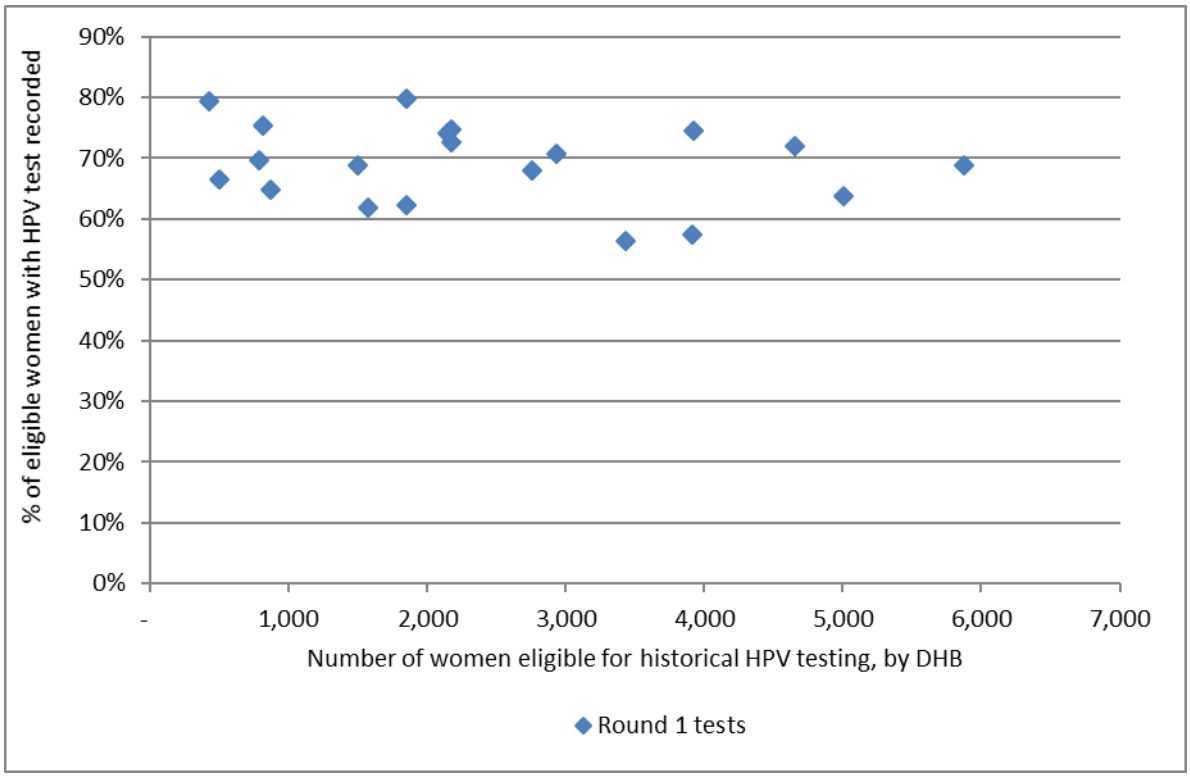
** Women are not followed up in the current report if they are no longer alive at the end of the current monitoring period; or if they have since had a non-squamous high -grade abnormality (no longer eligible for historical HPV testing).*

Table 90 - Women eligible for and proportion who have received historical HPV testing, by ethnicity

Ethnicity	Number of women eligible for historical testing as at 1 Oct 2009		Round 1 test recorded		Round 2 test recorded	
	All	In current report*	N	%	N	%
Māori	7,950	7,651	4,866	63.6	3,773	49.3
Pacific	1,240	1,203	582	48.4	456	37.9
Asian	1,696	1,677	912	54.4	756	45.1
European/ Other	39,617	38,662	27,112	70.1	23,117	59.8
Total	**50,503**	**49,193**	**33,472**	**68.0**	**28,102**	**57.1**

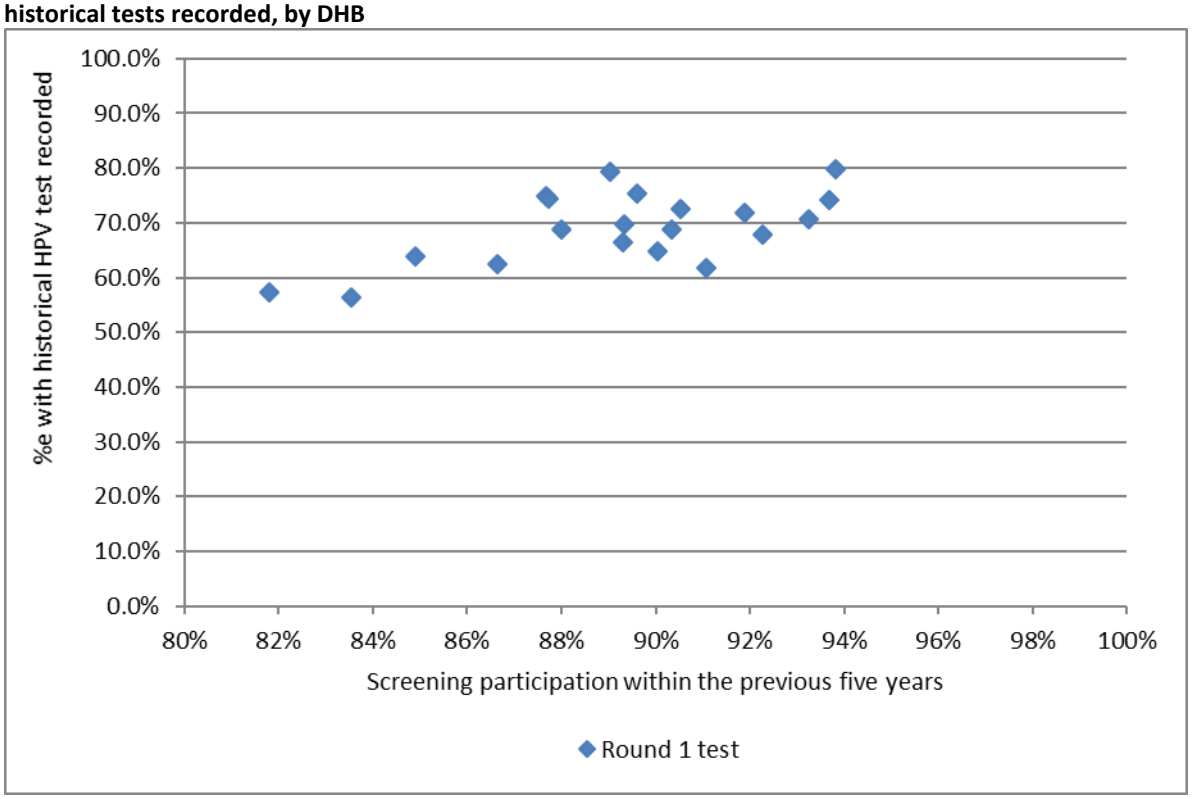
** Women are not followed up in the current report if they are no longer alive at the end of the current monitoring period; or if they have since had a non-squamous high -grade abnormality (no longer eligible for historical HPV testing).*

Figure 115 - Number of women eligible for historical testing within a DHB versus the percentage with a Round 1 historical HPV test recorded



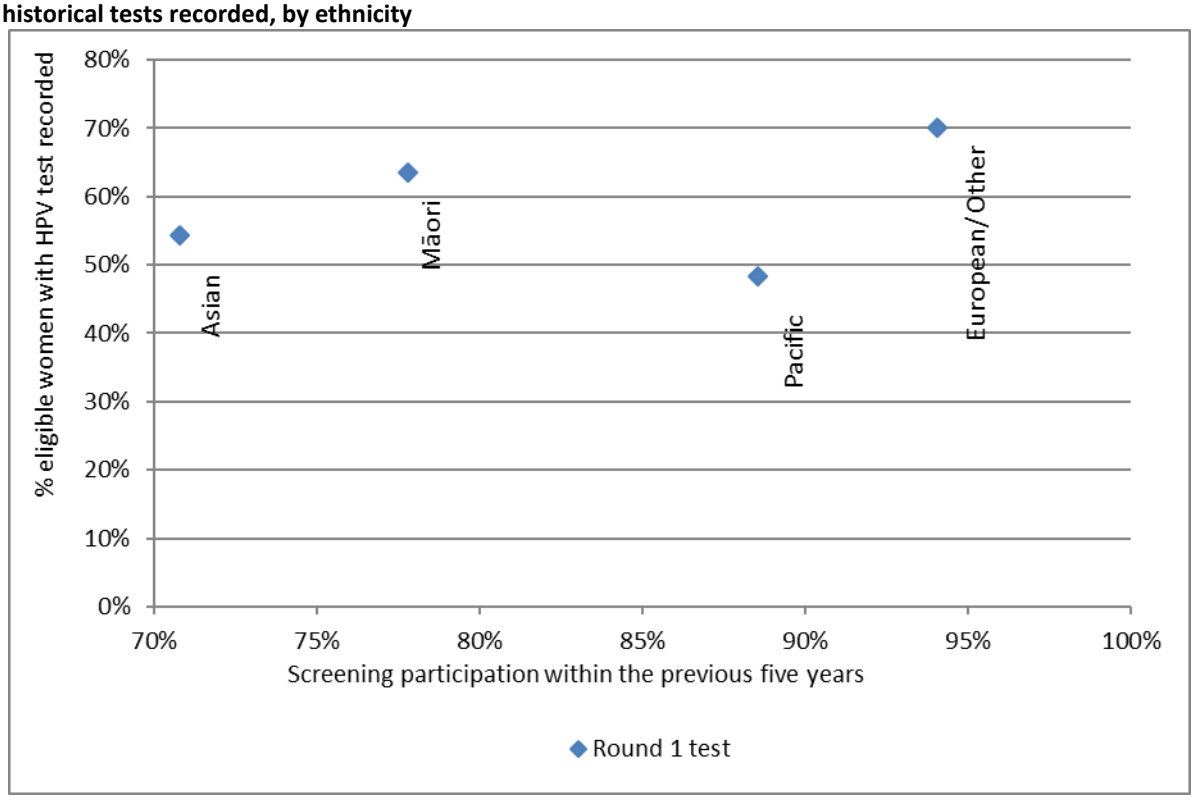
Each dot represents a DHB.
This chart does not suggest that there is any relationship between the number of women eligible for testing and percent of women who have been tested, therefore this does not seem a likely explanation for the variation in women tested in different DHBs.

Figure 116 - Relationship between women screened in the previous five years and proportion of women with historical tests recorded, by DHB



Each dot represents a DHB. See also Table 91

Figure 117 - Relationship between women screened in the previous five years and proportion of women with historical tests recorded, by ethnicity



Each dot represents an ethnicity

Table 91 - Women screened in the previous five years and proportion of women with historical round 1 and 2 tests recorded, by DHB

DHB	Women screened in the last 5 years %	Round 1 test recorded %	Round 2 test recorded %
Auckland	*81.8%*	57.3%	44.8%
Bay of Plenty	*93.3%*	70.7%	57.0%
Canterbury	*88.0%*	68.9%	60.4%
Capital & Coast	*92.3%*	67.9%	60.2%
Counties Manukau	*83.5%*	56.3%	43.5%
Hawke's Bay	*90.5%*	72.6%	62.0%
Hutt Valley	*90.3%*	68.7%	59.1%
Lakes	*91.1%*	61.9%	48.6%
Mid Central	*87.7%*	74.8%	66.0%
Nelson Marlborough	*93.8%*	79.8%	72.5%
Northland	*86.6%*	62.4%	47.6%
South Canterbury	*89.6%*	75.4%	66.5%
Southern	*91.9%*	71.9%	62.4%
Tairawhiti	*90.0%*	64.8%	53.3%
Taranaki	*93.7%*	74.2%	65.9%
Waikato	*87.7%*	74.5%	64.1%
Wairarapa	*89.3%*	66.4%	56.8%
Waitemata	*84.9%*	63.8%	49.0%
West Coast	*89.0%*	79.3%	70.6%
Whanganui	*89.3%*	69.7%	55.1%

Appendix B – Bethesda 2001 New Zealand Modified

TBS code	Descriptor
Specimen type	
CPS	Conventional pap smear
LBC	Liquid based cytology
COM	Combined (conventional and liquid based)
Specimen site	
T	Vault
R	Cervical
V	Vaginal
Adequacy	
S1	The specimen is satisfactory for evaluation (optional free text)
S2	The specimen is satisfactory for evaluation (optional free text). No endocervical/ transformation zone component present
UA	The specimen is unsatisfactory for evaluation because of insufficient squamous cells
UB	The specimen is unsatisfactory for evaluation because of poor fixation/preservation
UC	The specimen is unsatisfactory for evaluation because foreign material obscures the cells
UD	The specimen is unsatisfactory for evaluation because inflammation obscures the cells
UE	The specimen is unsatisfactory for evaluation because blood obscures the cells
UF	The specimen is unsatisfactory for evaluation because of cytolysis/autolysis
UG	The specimen is unsatisfactory for evaluation because … (free text)
General	
G1	Negative for intraepithelial lesion or malignancy
G2	Epithelial cell abnormality: See interpretation/result
G3	Other: See interpretation/result
Interpretation	
O1	There are organisms consistent with Trichomonas species
O2	There are fungal organisms morphologically consistent with Candida species
O3	There is a shift in microbiological flora that may represent bacterial vaginosis
O4	There are bacteria morphologically consistent with Actinomyces species
O5	There are cellular changes consistent with Herpes simplex virus
OT1	There are reactive cellular changes present (optional free text)
OT2	There are endometrial cells present in a woman over the age of 40 years
OT3	There are atrophic cellular changes present
ASL	There are atypical squamous cells of undetermined significance (ASC-US) present
ASH	There are atypical squamous cells present. A high -grade squamous intraepithelial lesion cannot be excluded (ASC-H)
LS	There are abnormal squamous cells consistent with a low -grade squamous intraepithelial lesion (LSIL; CIN1/HPV)
HS1	There are abnormal squamous cells consistent with a high -grade squamous intraepithelial lesion (HSIL). The features are consistent with CINII or CINIII
HS2	There are abnormal squamous cells consistent with a high -grade squamous intraepithelial lesion (HSIL) with features suspicious for invasion

TBS code	Descriptor
SC	There are abnormal squamous cells showing changes consistent with squamous cell carcinoma
AG1	There are atypical endocervical cells present
AG2	There are atypical endometrial cells present
AG3	There are atypical glandular cells present
AG4	There are atypical endocervical cells favouring a neoplastic process
AG5	There are atypical glandular cells favouring a neoplastic process
AIS	There are abnormal endocervical cells consistent with adenocarcinoma in-situ (AIS)
AC1	There are abnormal glandular cells consistent with endocervical adenocarcinoma
AC2	There are abnormal glandular cells consistent with endometrial adenocarcinoma
AC3	There are abnormal glandular cells consistent with extrauterine adenocarcinoma
AC4	There are abnormal glandular cells consistent with adenocarcinoma
AC5	There are abnormal cells consistent with a malignant neoplasm
Recommendation	
R1	The next smear should be taken in three years, based on the information held on the NCSP Register
R2	Please repeat the smear within three months
R3	Please repeat the smear within three months of the end of pregnancy
R4	Please repeat the smear in three months
R5	Please repeat the smear in six months
R6	Please repeat the smear in 12 months
R7	Because a previous smear showed atypical squamous cells or low -grade changes, please repeat the smear in 12 months
R8	Annual smears are indicated because of previous high -grade abnormality
R9	Referral for specialist assessment is indicated
R10	Urgent referral for specialist assessment is indicated
R11	[not in use]
R12	Please repeat the smear shortly after a course of oestrogen treatment
R13	Under specialist care
R14	In view of the abnormal clinical history provided, urgent referral for assessment is recommended regardless of cytological findings

Appendix C – SNOMED categories for histological samples

Adequacy of specimen		**1986 Code**	**1993 Code**		
Insufficient or unsatisfactory material for diagnosis		M09000	M09010		
There is no code for satisfactory materials.					
Site (topography) of specimen		**1986 Code**	**1993 Code**		
Vagina		T81	T82000		
Cervix (includes endocervix and exocervix)		T83	T83200		
Summary diagnosis	**Code stored on register**	**1986 Code**	**1993 Code**	**Diagnostic category**	**Rank***
There will be a maximum of four M codes transmitted to the register.					
Negative result - normal tissue		M00100	M60000	Negative/benign	1
Inflammation		M40000	M40000	Negative/benign	2
Microglandular hyperplasia		M72480	M72480	Negative/benign	3
Squamous Metaplasia		M73000	M73000	Negative/benign	4
Polyp		M76800	M76800	Negative/benign	5
Other (Morphologic abnormality, not dysplastic or malignant)		M01000	M01000	Negative/benign	6
Atypia		M69700	M67000	CIN 1	7
Benign glandular atypia		M81400	M67030	Negative/benign	8
HPV, koilocytosis, condyloma (NOS) Condyloma acuminatum	M76700	M76700 M76720	M76700 M76720	HPV	9
CIN I (LSIL) (VAIN I when used with T81/ T82000)		M74006	M67016	CIN 1	10
Dysplasia / CIN NOS		M74000	M67015	CIN 1	11
Glandular dysplasia		M81401	M67031	Glandular dysplasia	12
CIN II (HSIL) (VAIN II when used with T81/ T82000)		M74007		CIN 2	13
HSIL NOS		M67017	M67017	HSIL	14
CIN III (HSIL) (VAIN III when used with T81/ T82000) Carcinoma in situ		M74008 M80102 M80702	 M80102 M80702	CIN 3	17 15 16
Adenocarcinoma in situ		M81402	M81402	Adenocarc. in situ	18
Microinvasive squamous cell carcinoma		M80765	M80763	Micro-invasive	19
Invasive squamous cell carcinoma		M80703	M80703	Invasive SCC	20
Adenocarcinoma (endocervical type)		M83843	M83843	Adenocarcinoma (endocervical type)	21
Adenosquamous carcinoma		M85603	M85603	Adenosquamous carcinoma	22
Invasive adenocarcinoma (not endocervical type)		M81403	M81403	Invasive adenocarcinoma (not endocervical type)	23
Metastatic tumour		M80006	M80006	Other cancer	29
Undifferentiated carcinoma		M80203	M80203	Other cancer	24
Sarcoma		M88003	M88003	Other cancer	25
Other codes accepted	**Code stored on register**	**1986 Code**	**1993 Code**	**Diagnostic category**	**Rank**
Carcinosarcoma	M88003	M89803	M89803	Other cancer	26
Choriocarcinoma	M80003	M91003	M91003	Other cancer	27
Miscellaneous primary tumour	M80003	M80003	M80003	Other cancer	28
Small cell carcinoma	M80003	M80413	M80413	Other cancer	30
Malignant tumour, Small cell type	M80003	M80023	M80023	Other cancer	31

Other codes accepted	Code stored on register	1986 Code	1993 Code	Diagnostic category	Rank
Melanoma	M80003	M87203	M87203	Other cancer	32
Other primary epithelial malignancy	M80003	M80103	M80103	Other cancer	33

Appendix D – Indicator Definitions Targets and Reporting Details

Positive predictive value calculations

Table 92 - Definition used for positive predictive value calculations

Histology Diagnosis	G1	Squamous (G2)					Glandular (G2)			Other (G3)	Total
	G1	ASL	LS	ASH	HS1/2	SC	AG1-5	AIS	AC1-4	AC5	
Negative				q	y	y	a	a	a		
Squam-Atypia NOS				q	y	y	a	a	a		
Squam-Low-grade/CIN1/HPV				q	y	y	a	a	a		
Squam-High-grade/CIN 2-3				p	x	x	b	b	b		
Squam Microinvasive SCC				p	x	x	b	b	b		
Squam-Invasive SCC				p	x	x	b	b	b		
Gland-Benign Atypia				q	y	y	a	a	a		
Gland-Dyplasia				p	x	x	b	b	b		
Gland-AIS				p	x	x	b	b	b		
Gland-Invasive Adeno				p	x	x	b	b	b		
Other Malignant Neoplasm				p	x	x	b	b	b		

PPV% (ASC-H)= sum(p) / (sum(p)+sum(q))
PPV% (HSIL)= sum(x) / (sum(x)+sum(y))
PPV% (ASC-H + HSIL + SC)= (sum(p) + sum(x))/ (sum(p)+sum(q) +sum(x) + sum(y)

Appendix E – DHB assignment for colposcopy clinics

Where results in Indicator 7 (colposcopy indicators) are provided by DHB, the clinics included in each DHB are as listed below. Assignment of individual facilities to specific DHBs was provided by the NCSP. All other colposcopy clinics were grouped together as "Private practice".

DHB	Colposcopy clinics included*
Auckland	Ward 97 - Gynae Inpatient Auckland City Hospital
	General Surgery – Auckland City Hospital
	Colposcopy Clinic - Greenlane Clinical Centre
	Gynae Outpatient Clinic – Greenlane Clinical Centre
	Short Stay Surgical Unit – Greenlane Clinical Centre
	Emergency Medicine – North Shore Hospital
Bay of Plenty	Whakatane Hospital (G)
	Opotiki Hospital Outpatients' Department
	Tauranga Hospital (G)
Canterbury	Ashburton Hospital
	Christchurch Hospital
	Christchurch Sexual Health Centre
	Christchurch Women's Hospital - Colposcopy
	Christchurch Women's Hospital - Gynaecology
Capital & Coast	Colposcopy Clinic – Wellington Women's Hospital Outpatients Department
	Kenepuru Women's Outpatients' Department
	Women's Clinic – Wellington Regional Hospital
Counties Manukau	Manukau Super Clinic
	Gynaecology Clinic – [Middlemore Hospital]
	Colposcopy Clinic – Manukau Super Clinic
Hawke's Bay	Chatham Islands Health Centre
	Outpatients Dept – Napier Health Centre
	Villa 4, Gynaecology, Hawke's Bay Hospital
	Hawkes Bay Regional Hospital
	Wairoa Cervical Screening
	Wairoa Hospital
Hutt Valley	Women's Health Clinic – Hutt Hospital
	Gynaecology Clinic - Hutt Hospital
Lakes	Rotorua Hospital (Gynae Dept)
	Taupo Hospital
Mid Central	Colposcopy Clinic – Palmerston North Hospital
	Gynaecology Clinic - Palmerston North Hospital
	Gynaecology Clinic Horowhenua Hospital
Nelson Marlborough	Marlborough Maternity & Gynae
	Nelson Outpatients Department
Northland	Colposcopy Clinic Whangarei Hospital
	Kaitaia Hospital Colp Outpatients' Department
	Bay Of Islands Hospital Outpatients' Department
	Gynaecology Clinic Whangarei Hospital
South Canterbury	Timaru Hospital - Colp/Gynae

DHB	Colposcopy clinics included*
Southern	General Gynae Department – Dunedin Hospital
	Dunedin Public Hospital
	Dunedin Colposcopy Clinic
	Southland Hospital Gynaecology
Tairawhiti	Gisborne Hospital
Taranaki	Taranaki Health Base Hospital - Outpatients Department
	Hawera Outpatients
Waikato	Te Kuiti Hospital
	Womens Outpatient Services – Waikato Hospital
	Tokoroa Hospital - Bev Thorn
Wairarapa	Gynaecology Clinic – Wairarapa Hospital
Waitemata	Colposcopy Clinic- Waitakere Hospital
	Gynaecology Clinic –North Shore Hospital
	Colposcopy Clinic- North Shore Hospital
	Peri-Operative Department - North Shore Hospital
West Coast	Greymouth Hospital
	Gynaecology Clinic Greymouth
Whanganui	Wanganui Hospital
	Gynaecology Clinic – Good Health Wanganui

** Assignment of specific facilities to a DHB was provided by the NCSP, in order to distinguish between DHB clinics and private practice, because the NCSP Register records geographic DHB and does not record public vs private clinic.*

Appendix F – Glossary

Term	Definition
AGC	Atypical glandular cells
AIS	Adenocarcinoma in situ. High-grade changes to the glandular (endocervical) cells of the cervix
ASC-H	Atypical squamous cells of undetermined significance, cannot exclude high -grade
ASC-US	Atypical squamous cells of undetermined significance
ASR	Age standardised rate
CI	Confidence interval
CIN	Cervical intra-epithelial neoplasia; CINI: low -grade; CIN 2 or 3: high -grade
CIS	Carcinoma in situ. An older classification of CIN 3. Abnormal cells that are confined to the surface epithelium of the cervix.
CPS	Conventional Pap (Papanicolaou) Smear
DHB	District Health Board
European/ Other	European women and women from non-Māori ,non-Pacific and non-Asian ethnic groups
HPV	Human papillomavirus
HPV test	Testing for a high risk (oncogenic) subtype of human papillomavirus
hrHPV	A high risk (oncogenic) subtype of human papillomavirus
HSIL	High -grade squamous intra-epithelial lesion
ISC	Invasive squamous carcinoma
LBC	Liquid based cytology
LSIL	Low -grade squamous intra-epithelial lesion
NCSP	National Cervical Screening Programme
NHI	National Health Index
NILM	Negative for intraepithelial lesion or malignancy (a negative cytology report)
NSU	National Screening Unit of the Ministry of Health
NPV	Negative predictive value. The proportion of the screened population with negative test results who do not have the disease being tested for.
OR	Odds ratio
PCR	Polymerase chain reaction. A technique in molecular genetics used in many types of HPV testing
PPV	Positive predictive value. The proportion of the screened population with positive test results who have the disease being tested for.
RR	Relative risk
SC	Squamous cell carcinoma (TBS 2001)
SCC	Squamous cell carcinoma
SNOMED	Systematised Nomenclature of Medicine. A systematically organised collection of medical terminology including histopathological diagnoses.
TBS 2001 (NZ Modified)	The Bethesda System 2001 New Zealand Modified. A management system based on categorising the cytological interpretation of cellular abnormality as negative, low-grade or high-grade.
TZ	Transformation zone. The region of the cervix where the glandular precursor cells change to squamous cells

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