National Cervical Screening Programme

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1 July – 31 December 2018

Technical report 50

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About the authors

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 July to 31 December 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 1,302,711 eligible women aged 25-69 years at the end of the monitoring period, 939,427 (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.
- The coverage target was not met in any DHB.
- Nationally, coverage targets were not met for any ethnic groups. Coverage for Māori, Pacific, Asian and European/ Other women was 62.1%, 67.3%, 59.9% and 77.9% respectively (screened within the previous three years).
- Three-year coverage among women aged 25-69 years (72.1%) is similar to that reported in the previous monitoring report (72.1%). It is higher in Māori and Asian women, and is lower for European/ Other and Pacific women.
- Three-year coverage is lower in three of the ten age groups.
- Three-year coverage is lower in seven of twenty DHBs.
- Five-year coverage among women aged 25-69 years (85.7%) is similar to that reported in the previous monitoring report (85.8%).
- 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.

Screens in women aged less than 20 years

Target: None

- In the three years to 31 December 2018, 4,919 women had a cervical sample taken when they were aged less than 20 years. This is fewer than in the previous monitoring period (5,309 women).
- This represents 0.5% of all women (of any age) who were screened in the three-year period (which is the same as the previous monitoring period, 0.5%).
- Most of these women (89.9%) were aged 18-19 years at the time of their cervical sample.

Indicator 1.2 Regularity of screening

Target: Not yet defined

Routine screening (3-year recall)

- Among women attending for screening in 2018 following a 3-year recall recommendation, 63.0% were attending on-time; 12.0% more than six months early; and 24.9% more than six months late.
- Between the period 2014 to 2018, the proportion of women who were screened on-time increased in three of the four ethnic groups and three of the five ten-year age groups. This predominantly reflected a reduction in early re-screening.
- The proportion re-attending more than six months late for their routine screen was consistently higher in Māori and Pacific women than in Asian and European/ Other women, and was generally highest in women aged 30-39 years.

12-month re-screening

- Among women attending for screening in 2018 following a 12-month repeat recommendation, 40.0% were attending on-time; 2.0% more than three months early; and 58.0% more than three months late.
- In 2018, the majority of women who were re-attending after a recommendation to return in 12 months were re-attending more than three months later than recommended. This was the case for all ethnic groups, and all age groups.
- The proportion who were re-attending more than 15 months after a recommendation to return in 12 months was consistently higher in Māori and Pacific women than in Asian and European/ Other women, and was consistently highest in women aged 30-39 years.
- Over the period 2014 to 2018, the proportion of women who were re-attending more than three months early and the proportion who were re-attending more than three months late for 12-month follow-up both decreased. There was a corresponding increase in the proportion of women who were re-attending on-time.

Indicator 2 First screening events

Target: None

- There were 23,919 women who had their first screening event during the current monitoring period – a slight increase compared to the previous monitoring period.
- First screening events generally occur among young women (median age 26 years; 25th and 75th percentiles: 21-34 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; 27-38 years) compared to Māori (22; 20-25 years), Pacific (25; 22-33 years), and European/ Other (24; 21-32 years) women.

- The proportion of all 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 15 women aged between 20-69 years who withdrew from the NCSP Register during this six-month period, fewer than the previous monitoring period (22 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.

- 11.6% 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 7.0% in Tairawhiti to 16.5% in Waitemata.
- Early re-screening occurs in all ethnic groups, but is most common among European/ Other (13.1%) and least common among Pacific women (7.6%).
- Early re-screening occurs in all age groups, but is most common in women aged 20-24 years at the end of the period (15.6%) and least common in women aged 65-69 years at the end of the period (7.6%).
- Early re-screening is slightly lower overall since the previous report, from 12.1% to 11.6%. However, rates are higher than in the previous report in some DHBs (Bay of Plenty, Hawke's Bay, Hutt Valley, Lakes, Northland, South Canterbury, Waitemata, West Coast, Whanganui) and age groups (women aged 30-34 and 60-64 at the end of the period).

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 four of the six laboratories, and was met nationally (1.3%).
- The rate of unsatisfactory LBC samples is the same as in the previous report (1.3%).

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 by all six laboratories.
- Nationally, the percent of samples which are negative (93.3%) is the same as what was reported in the previous period (93.3%).

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 the same as what was reported in the previous period.

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 five out of six laboratories.
- Nationally the percent of HSIL samples (0.8%) was the same in the last monitoring report.
- In women aged 20-24 years the rate of HSIL samples (2.0%) is again lower than has ever been previously reported.

Indicator 5.2 <u>Cytology positive predictive value</u>

HSIL + SC

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

- Four of six laboratories met the target range for HSIL + SC.
- Nationally, the positive predictive value of HSIL + SC was lower in this monitoring period (79.6%) than in the previous report (80.2%).

Other cytological abnormalities

Target: None

- Nationally, the positive predictive value of ASC-H is lower compared to the previous report (52.2% in this report, 55.4% in the previous report).
- Nationally, the positive predictive value of the combination of ASC-H + HSIL + SC is similar compared to the previous report (70.5% in both reports).
- Nationally, the percent of glandular cytological abnormalities identified as histological high -grade is lower than in the previous report, from 50.0% to 44.4% (however this measure is generally

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based on a comparatively small number of samples; 142 samples with histology in the current report).

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

- Nationally, 5.5% of slides originally reported as negative, benign/ reactive or unsatisfactory were consistent with HSIL+ on review.
- All laboratories met the target.

Target: Not more than 20% identified as ASC-H, HS1, HS2, SC, AG4-AG5, AIS or AC1-AC5 (ASC-H+) on review; aim for less than 15%

- Nationally, 10.0% of slides originally reported as negative, benign/ reactive or unsatisfactory were consistent with ASC-H+ on review.
- All laboratories met the target of less than 20% and achieved rates of less than 15%.

Indicator 5.4 Histology reporting

Target: None

- 12,239 histology samples were taken during the current monitoring period. 402 (3.3%) of these were insufficient for diagnosis.
- Results for most severe histology from 10,584 women with samples which were sufficient for diagnosis are presented.
- 56.5% of women had histology samples which were negative/ benign. This reduced to 45.4% of women when negative/benign hysterectomy samples (total hysterectomy and partial hysterectomy with cervical component) were excluded.
- 1,961 (18.5%) women had HSIL (CIN 2/3 or HSIL not otherwise specified) histology results.
- 80 (0.76%) women had histology results indicating adenocarcinoma in situ (AIS).
- 71 (0.67%) women had invasive squamous cell carcinoma (ISCC) histology results, 28 (0.26%) women had adenocarcinomas not arising from the endocervix and 17 women (0.16%) adenocarcinoma arising from the endocervix histology results. Four women (<0.05%) had adenosquamous carcinoma histology results.
- CIN2/3 rates decreased in all age groups, except three (<20 years, 40-44 years and 60-64 years).

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 (96.9%), and was met by all six laboratories.
- The 15-working-days target was met nationally (99.2%), and in all six laboratories.
- Performance against the seven-working-days target is higher when compared to the previous report (94.9% in previous report, 96.9% in the current monitoring period).
- The overall percent of cytology samples reported within 15-working-days (99.2%) is similar to the previous monitoring period (99.0%).

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 (92.9%).
- The target was not met for reporting within 15 working days (97.2%).
- Targets were met by eight of fourteen laboratories (10-working-day target) and seven of fourteen laboratories (15-working-day target).
- The overall proportion of histology samples reported within 15 days (97.2%) was the same as what was reported in the previous report.

Low-grade cytology with associated HPV triage testing

Target: 98% within 15 working days

- There were 3,198 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 (99.2%).
- Five of the six laboratories met the target.

Indicator 6

<u>Follow-up of women with high -grade cytology – histology</u>

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).
- 83.8% of women had a histology report within 90 days of their high -grade cytology report; 88.5% of women had one within 180 days.
- Two DHBs met the target for histological follow-up within 90 days and one DHB met the target for 180 days.
- Nationally, the proportion of women with histological follow-up is lower at 90 days (from 84.0% to 83.8%) and at 180 days (from 89.1% to 88.5%) since the previous monitoring period.

- Compared to the previous monitoring period, the proportion of women with follow-up histology within 90 days is higher for Pacific women (from 71.1% to 74.0%) European/ Other women (85.4% to 86.1%) but decreased for Māori women (from 80.3% to 78.2%), and Asian women (from 86.5% to 82.7%).
- The proportion of women with follow-up histology within 180 days is higher for Pacific and Asian women but decreased for European/ Other and Māori women.

Women with no follow-up tests

Target: None

- Nationally, 160 (8.5%) 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 104 (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 slightly increased (from 8.2% to 8.5%) while the proportion remained the same for 180 days over the last two reports (5.5%).
- Compared to the previous monitoring period, the proportion of women with no follow-up test recorded at 180 days is higher for Māori (from 8.2 to 8.8%), Pacific (from 12.0% to 12.5%) and European/ Other women (from 4.1% to 4.4%) but decreased for Asian women (from 8.2% to 4.6%).

Indicator 7 <u>Colposcopy</u>

Indicator 7.1 <u>Timeliness of colposcopic assessment – high -grade cytology</u>

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 1,882 women with high -grade cytology results who were not already under specialist management (the same women reported on in Indicator 6).
- This comprised 65 women with high -grade results indicating a suspicion of invasive disease and 1,817 women with other high -grade results.
- Nationally, the proportion of women with accepted referrals recorded on the NCSP Register (89.2%) is lower than the previous report (90.2%).

Suspicion of Invasive Disease

- Among the 65 women with high -grade cytology results indicating a suspicion of invasive disease, 36 (55.4%) had an accepted referral. Of

the women with an accepted referral, 80.6% were seen within 10 working days of their referral being accepted. This is lower than in the previous report (83.3%).

- A colposcopy visit was recorded for 59 (90.8%) of the 65 women with high -grade cytology indicating suspicion of disease as of 31 December 2018 (follow-up time of at least six and up to 12 months).
- These results likely underestimate women with appropriate follow-up, as many women referred with suspicion of invasive disease are referred directly to gynae-oncology instead of colposcopy.

No Suspicion of Invasive Disease

- Among the 1,817 women with other high -grade cytology results, 1,643 (90.4%) had an accepted referral. Of the women with an accepted referral, 76.5% 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 (75.7%).
- A colposcopy visit is recorded for 1,720 (94.7%) of these women as of 31 December 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 3,544 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 July - 31 December 2017).
- Subsequent accepted referrals are recorded for 3,091 (87.2%) of these women, and subsequent colposcopy (31 December 2018) for 3,230 (91.1%) of these women.
- Nationally, 86.7% of women attended for colposcopy within 26 weeks of their accepted referral. This is lower than in the previous monitoring report (88.8%).

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 11,670 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 92.5% of colposcopy visits.
- The type of recommended follow-up was recorded for 94.1% of colposcopy visits, and the recommended timeframe for this follow-up was recorded for 93.4 of colposcopy visits.
- Colposcopic appearance was reported as abnormal in 54.6% 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 (92.5%) to the previous monitoring period (92.6%).
- The number of colposcopies recorded on the NCSP Register was lower than what had been reported in the previous report (4.3% decrease).
- 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.

- 66.3% of 2,108 women with HSIL (CIN 2/3) histology during the period 1 January to 30 June 2018 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 (66.3%) was higher than the previous monitoring period (63.8%).
- No 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, 1,341 women were treated for high -grade lesions in the period 1 July to 31 December 2018.
- 75.0% of women treated have a record of both colposcopy and cytology within the nine months after their treatment visit. 75.8% have a record of at least a colposcopy visit (with or without cytology) in the same time period.
- Three DHBs 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 1,015 women who were eligible for appropriate discharge within 12 months of their treatment (75.7% of all women

treated for CIN 2/3). Of these women, 873 (86.0%) were discharged to their sample taker within 12 months.
- Nine 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, 96.6% of women aged 30 years or more with an eligible ASC-US cytology result, and 95.6% 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 0.8% of women with an ASC-US result, and 0.7% of women with an LSIL result; 21 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 (96.6%, compared to 97.3% in the previous report) and for women with LSIL results (95.6%, compared to 96.7% in the previous report).

Positive triage tests

- Among women aged 30 years or more with a valid HPV triage test results, 24.0% of women with ASC-US results and 59.1% of women with LSIL results were positive for high risk HPV.
- Positivity for high risk HPV varied by laboratory (from 14.3% to 35.8% for ASC-US, and from 50.0% to 63.6% 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 (24.0%, compared to 24.5% in the previous period), but increased for LSIL (59.1%, compared to 58.5%, 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 (July – December 2017), 93.0% of women have a record of colposcopy and 61.6% have a record of histology within 12 months of their triage test. The corresponding percentages for LSIL are 92.8% with colposcopy and 66.6% 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 14.2% for women with triage-positive ASC-US cytology and 14.1% for women with triage-positive

LSIL cytology. This corresponded to 45 of the women with ASC-US cytology and 116 of the women with LSIL cytology.

- Among women with histology recorded within 12 months of a triage test, 21.4% of women with ASC-US cytology and 19.6% of women with LSIL cytology had a histological outcome of CIN 2+.

Indicator 8.2 HPV test volumes

Target: None set.

- Nationally, there were 17,419 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; capturing two rounds), 35.7% were taken to manage women with high -grade squamous cytology or histology more than three years ago (historical testing), 7.0% were taken at colposcopy (potentially to assist in resolving discordant results), and 17.2% 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. This varied by laboratory, from 13.8% for LabPLUS to 32.7% for Southern Community Labs Dunedin.
- The proportion of HPV tests which are invalid is very small (0.03%).
- Overall HPV test volumes have decreased since the previous report (4.8% decrease since the previous monitoring period); this decrease largely due to a 7.2% decrease in HPV testing for historical testing.

Indicator 8.3 Historical HPV tests for follow-up of women with previous high -grade abnormality

Target: None set.

- This analysis followed up 49,092 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 34,078 women (69.4% with a Round 1 historical HPV test recorded, and 28,971 women (59.0%) with a Round 2 historical HPV test recorded.
- The proportion of women who had received a historical HPV test varied by DHB, from 58.6% to 80.7% for Round 1 tests and from 45.9% to 73.5% for Round 2 tests.
- For women aged 25 to 69 years, the proportion of women who had received a historical HPV test varied from50.0% (25-29 years) to 72.5% (60-64 years) for Round 1 tests, and from 40.9% (25-29 years) to 62.5% (60-64 years) for Round 2 tests.
- The proportion of women who had received a historical HPV test varied somewhat by ethnicity, from 50.4% (Pacific women) to 71.4%

(European/ Other women) for Round 1 tests and from 39.8% (Pacific women) to 61.6% (European/ Other women) for Round 2 tests.

- The proportion of eligible women with an HPV test recorded is higher than in the previous report from 68.0% to 69.4% for Round 1 tests, and from 57.1% to 59.0% 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: NCSP@health.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 8 March 2019.

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 31 December 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 estimates used from Report 49 on and that were employed in this monitoring report were 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 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 Table 35.

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, ethnicity and DHB) who had not had a hysterectomy prior to 31 December 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 31 December 2018) were also updated in Report 49, 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-February 2019) 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] Coding of ethnicity on the NCSP Register follows the classification used by the Ministry of Health.[3,4] 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

The methods developed for calculating the indicators used to monitor the NCSP are reviewed and revised approximately every three years, consistent with other international programmes. In addition, 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 indicators 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*** 939,427 (72.1%) women aged 25-69 at the end of the current monitoring period (31 December 2018) had at least one cervical sample taken during the previous three years. This does not yet meet the target of 80%. 1,117,030 (85.7%) 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 ethnic group. European/ Other women, Māori, Pacific and Asian coverage among women aged 25-69 years was 77.9%, 62.1%, 67.3% and 59.9% 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 (58.4%) and was highest for women aged 45-49 (78.5%; Figure 2, Table 25). Coverage was also low for women aged 20-24 years (45.1%), 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 66.8% (Auckland) to 78.9% (Taranaki). 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 explored at the DHB level (Table 26), and by age group (Table 27). Three-yearly coverage for Māori women ranged from 51.3% (Auckland) to 72.3% (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 53.5% (Northland) to 92.7% 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 47.8% (Southern) to 71.8% (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 71.0% (Counties Manukau) to 86.1% (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 (Aukland, Bay of Plenty, Capital and Coast, Lakes, Southern, and Taranaki).

Three-yearly coverage for Māori women ranged from 57.9% (25-29 years) to 66.4% (50-54 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 50.7% (25-29 years) to 82.4% 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 41.2% (25-29 years) to 67.8% (60-64 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 65.6% (25-29 years) to 85.3% (45-49 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 80.3% for Auckland to 91.5% for Nelson Marlborough (Figure 8, Table 26); by age from 71.4% for women aged 25-29 years to 93.1 for women aged 45-49 years (Figure 9, Table 30) and from 70.2 (Asian) to 91.6% (European/ Other; Figure 11, Table 29). Five-yearly coverage for Māori women ranged from 64.3% (Auckland) to 91.2% (Hawke's Bay; Figure 11, Table 31). Five-yearly coverage for Pacific women ranged from 66.4% (Northland) to all women (South Canterbury and Wairarapa; Figure 13, Table 31). Five-yearly coverage for Asian women ranged from 53.9% (Whanganui) to 84.1% (Hutt Valley; Figure 14, Table 31). Five-yearly coverage in European/ Other women ranged from 84.4% (Counties Manukau) to 98.6% (Bay of Plenty; 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

A total of 4,919 women who were aged less than 20 years at the time of their cervical sample had a cervical sample taken in the three years to 31 December 2018. 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 916 (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 1.8% (Northland) to 5.2% (West Coast). 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 15, 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 (89.9%; Table 34). This may represent opportunistic screening of women aged 18-19 years. This proportion varied from 80.0% in Tairawhiti to 95.8% 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 similar in the current monitoring report (72.1% within the last three years, and 85.7% within the last five years) to the previous monitoring report (72.1% within the last three years, and 85.8% within the last five years).

The proportion of Asian women screened was 59.1% in the previous period and 59.9% in the current period; the proportion of Pacific women screened was 68.6% in the previous period and 67.3% in the current period. Small differences between reports exist for Māori (61.8 % in the previous report,

62.1% in the current report) and European/ Other (78.0% in the previous report, 77.9% in the current report; Figure 19, Table 39).

Screens in women aged less than 20 years

The number of women screened who were aged under 20 years is lower: from 5,308 in the previous monitoring period to 4,919 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 the same (0.5% in both reports). The number of women screened who were aged less than 20 years at the time of their cervical sample is lower in nineteen of the twenty DHBs, and remained constant in one, 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 (89.9%, compared to 89.4% previously), with increases occurring in fourteen of twenty DHBs (Figure 21). As in previous reports, it would appear that in New Zealand overall, screens in very young women are reducing, and when women aged less than 20 years are screened, it increasingly reflects opportunistic screening of women aged 18-19 years.

Comments

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 report 49 and 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 these reports 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 14), the hysterectomy prevalence estimates used to make the adjustment includes all women with a hysterectomy, some of whom may still require cervical screening. 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

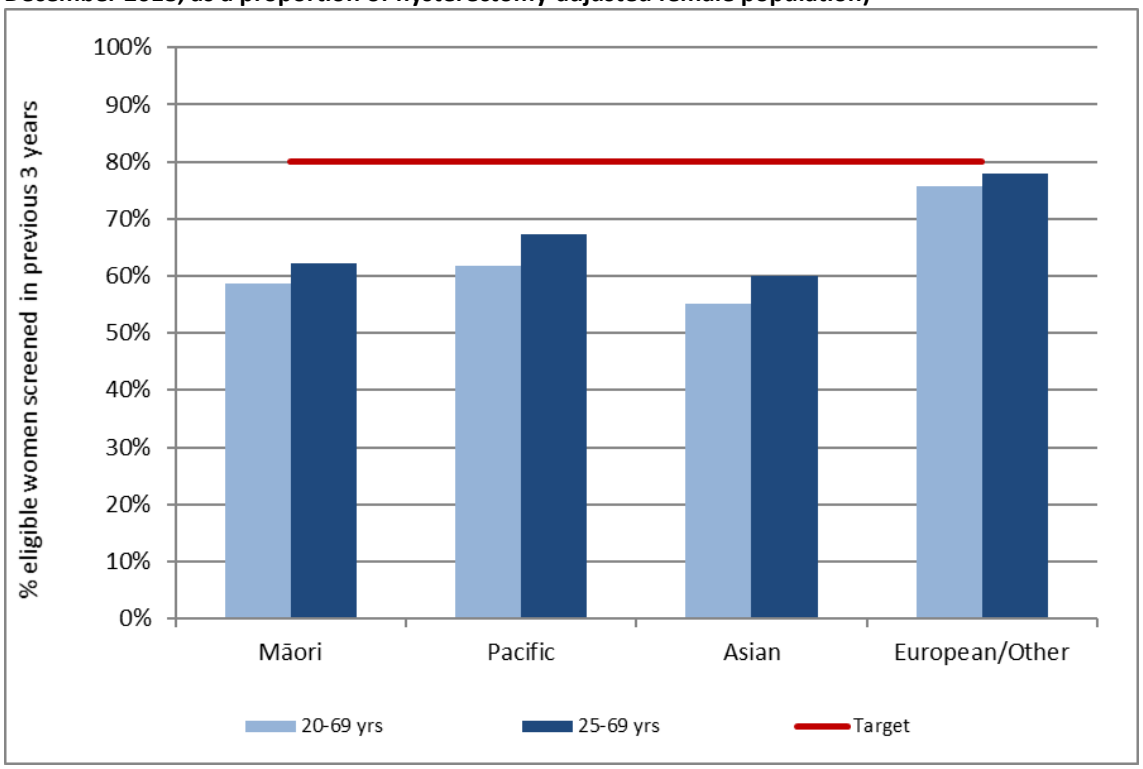
calculating coverage as a proportion of the total New Zealand female population (i.e. regardless of whether they have had a hysterectomy or not). Results for this analysis appear in Table 35.

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.

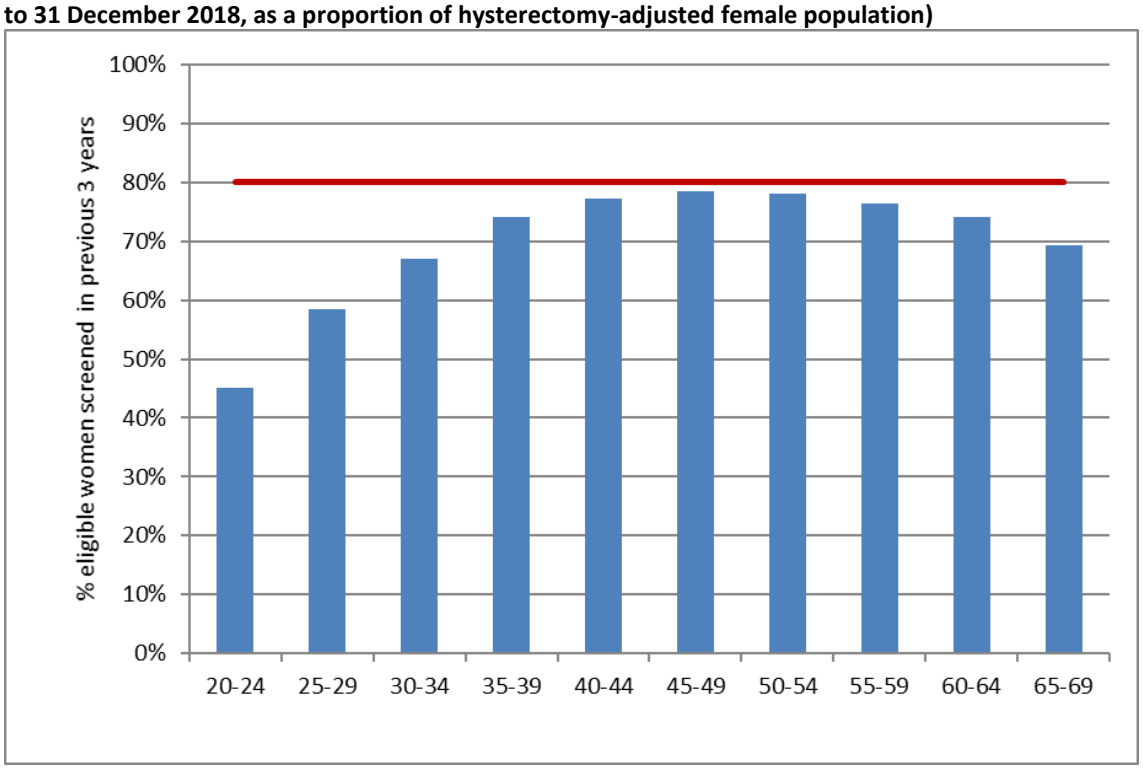
Coverage in women aged 20-24 years is likely to remain lower than for other ages and coverage in this age group should be interpreted with caution, as many women will have had a shorter period in which they were eligible for screening. In 2019, National Cervical Screening Programme will be changing the 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[5]. 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 31 December 2018, as a proportion of hysterectomy-adjusted female population)



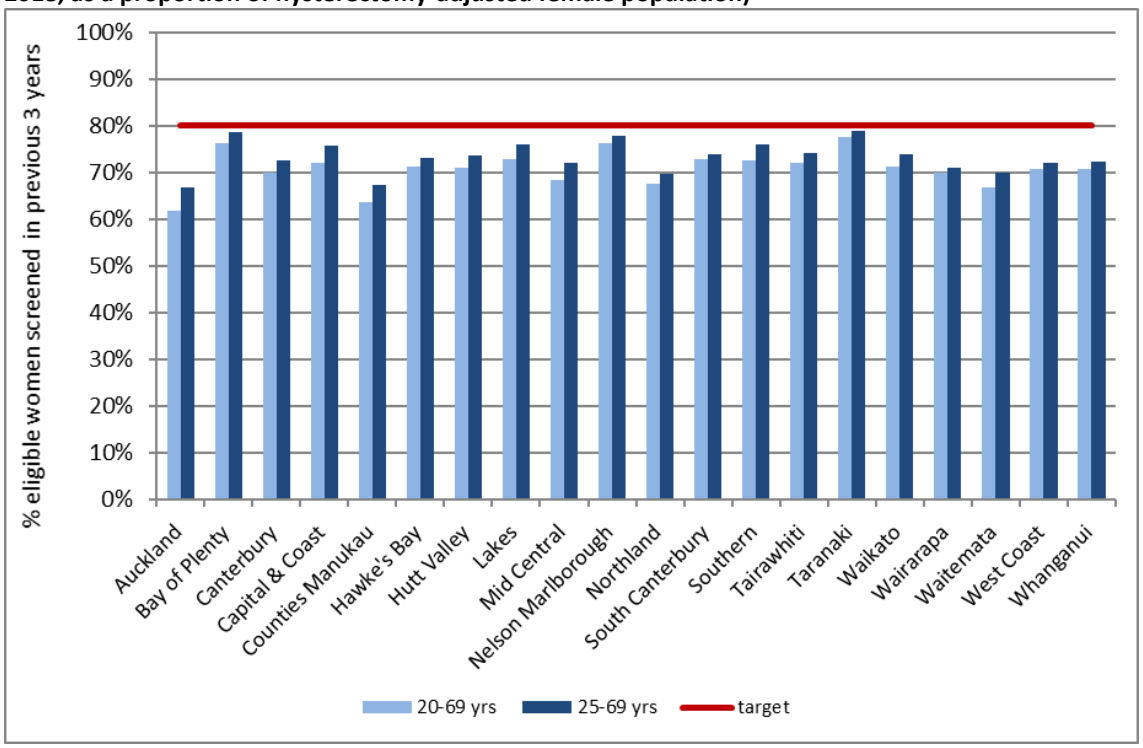
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target: 80% for ages 25-69 years, hysterectomy adjusted. See also Table 24.

Figure 2 - Three-year coverage by five-year age group (women 20-69 years screened in the three years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population)



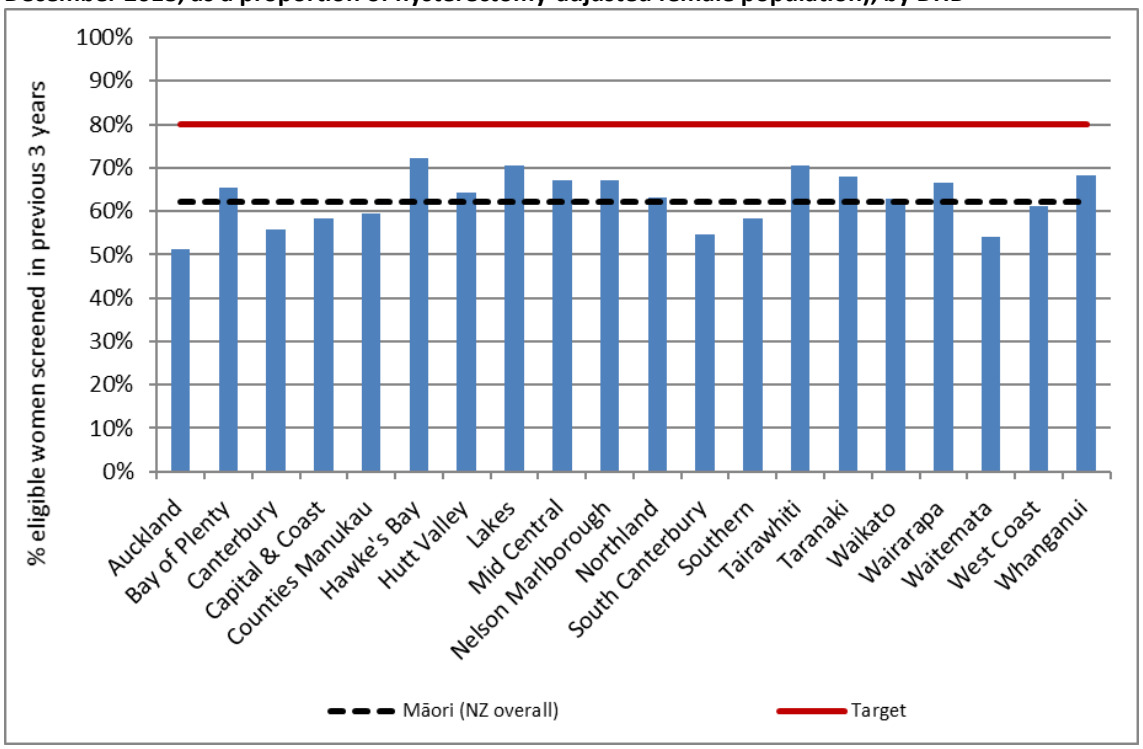
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target: 80% for ages 25-69 years, hysterectomy adjusted. See also Table 25.

Figure 3 - Three-year coverage by DHB (women 25-69 years screened in the three years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population)



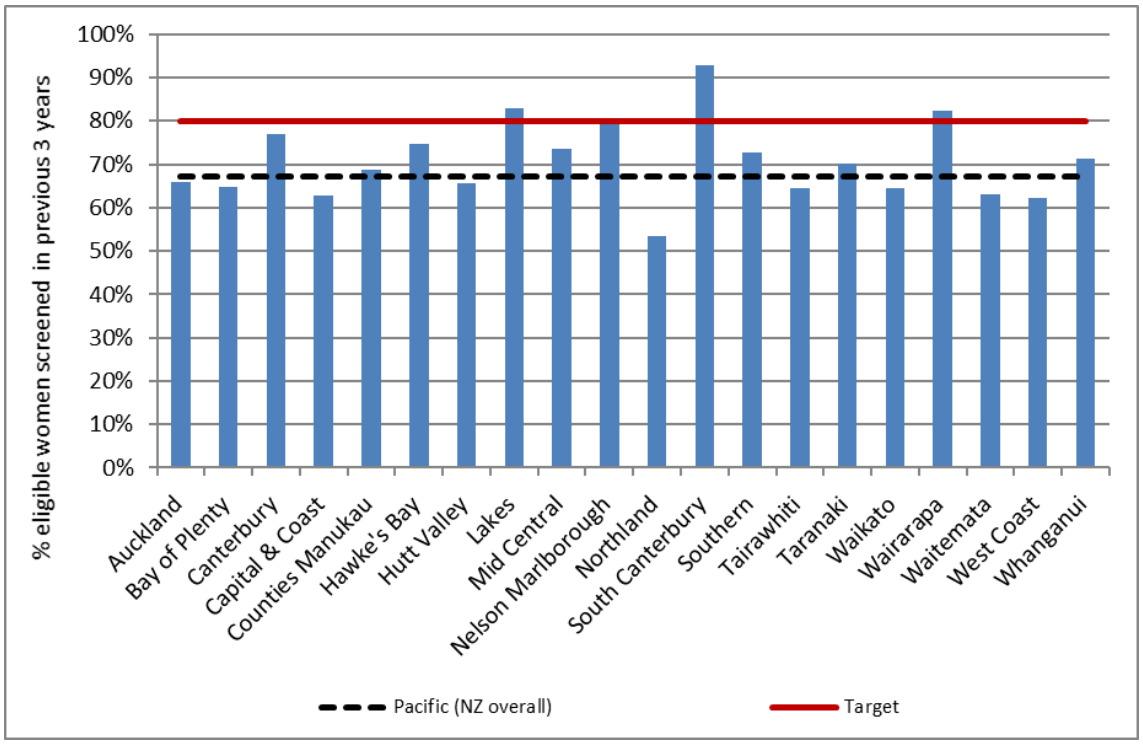
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted. See also Table 23.

Figure 4 - Three-year coverage in Māori women (women 25-69 years screened in the three years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



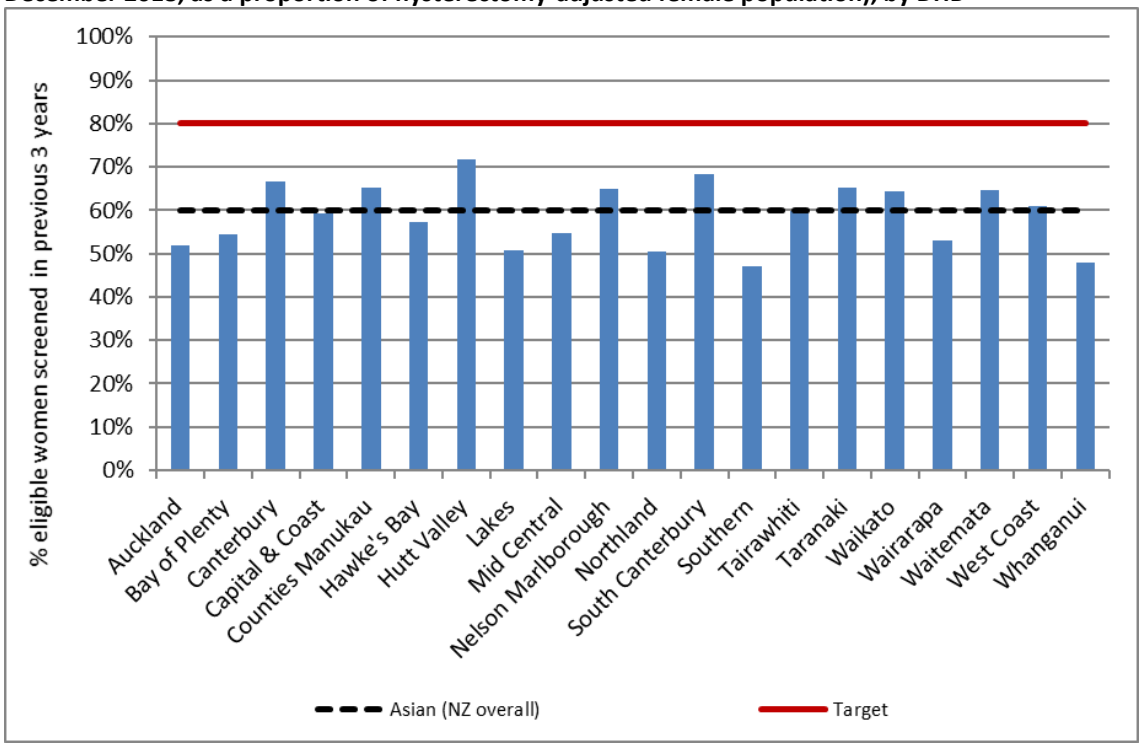
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 5 - Three-year coverage in Pacific women (women 25-69 years screened in the three years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



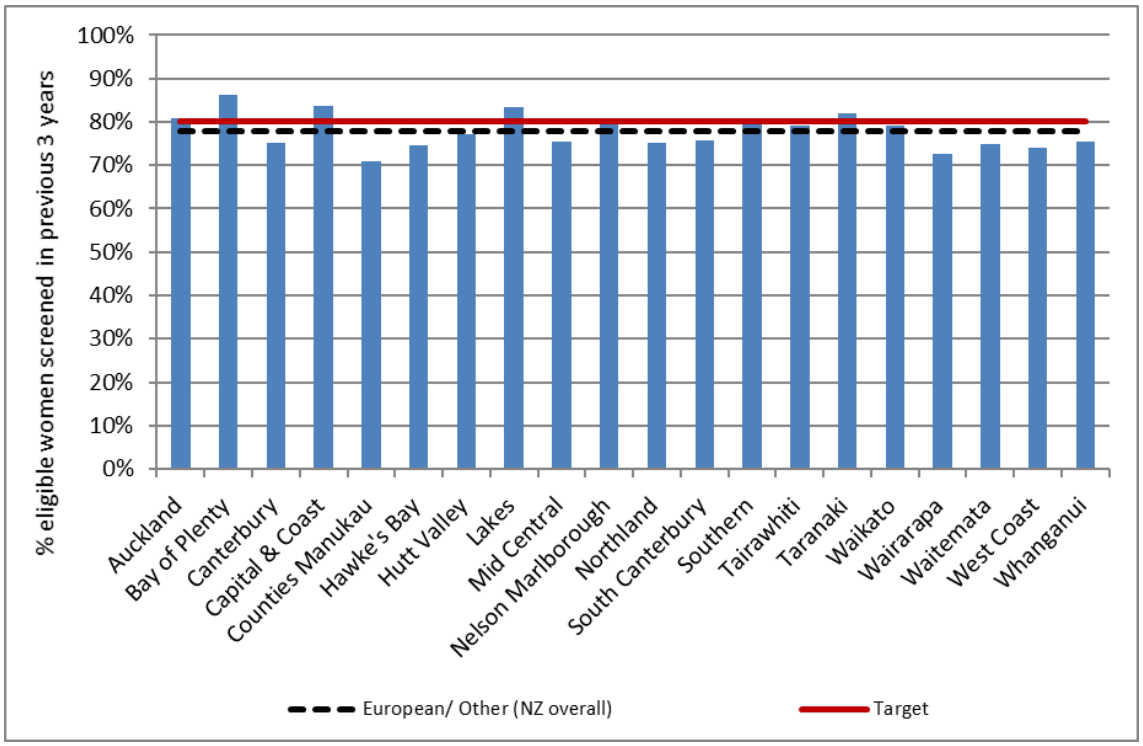
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 6 - Three-year coverage in Asian women (women 25-69 years screened in the three years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



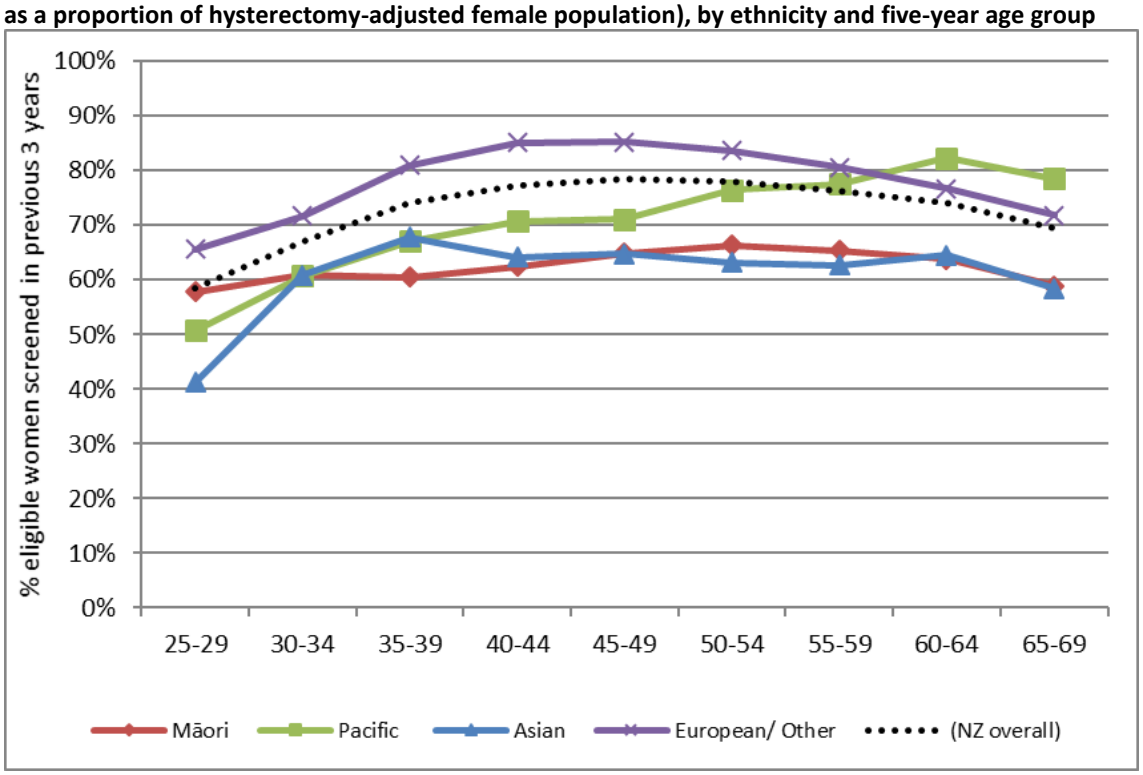
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 7 - Three-year coverage in European/ Other women (women 25-69 years screened in the three years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



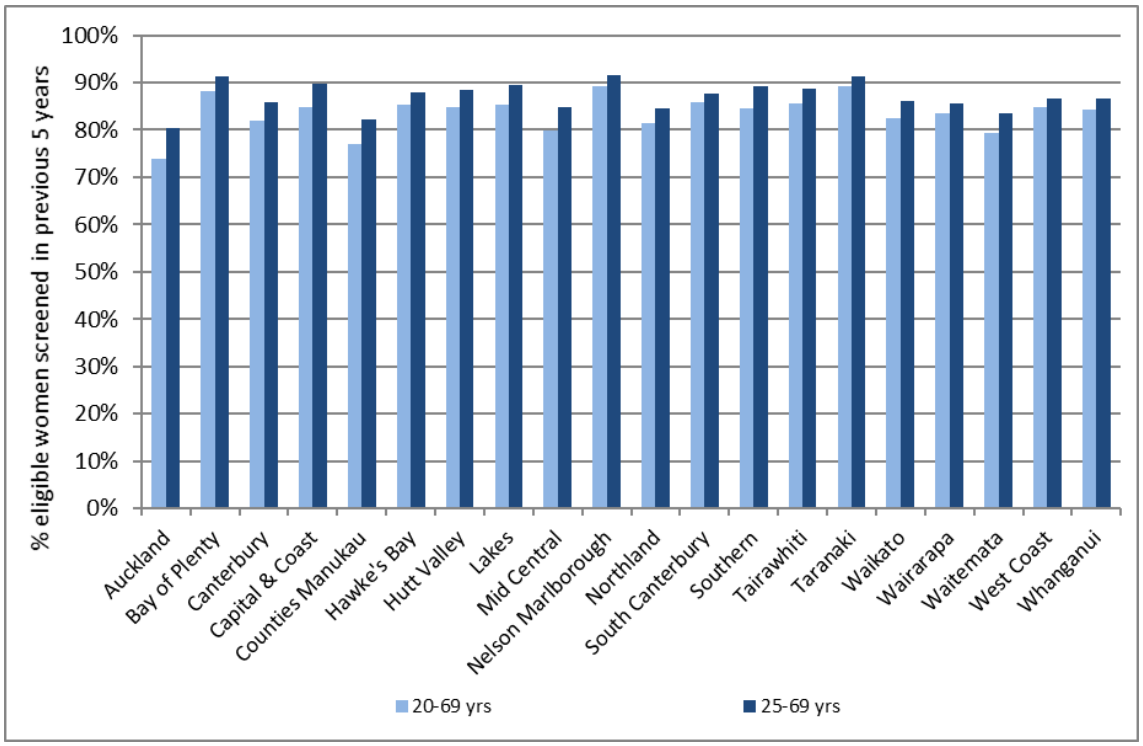
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 8 - Three-year coverage (women 25-69 years screened in the three years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by ethnicity and five-year age group



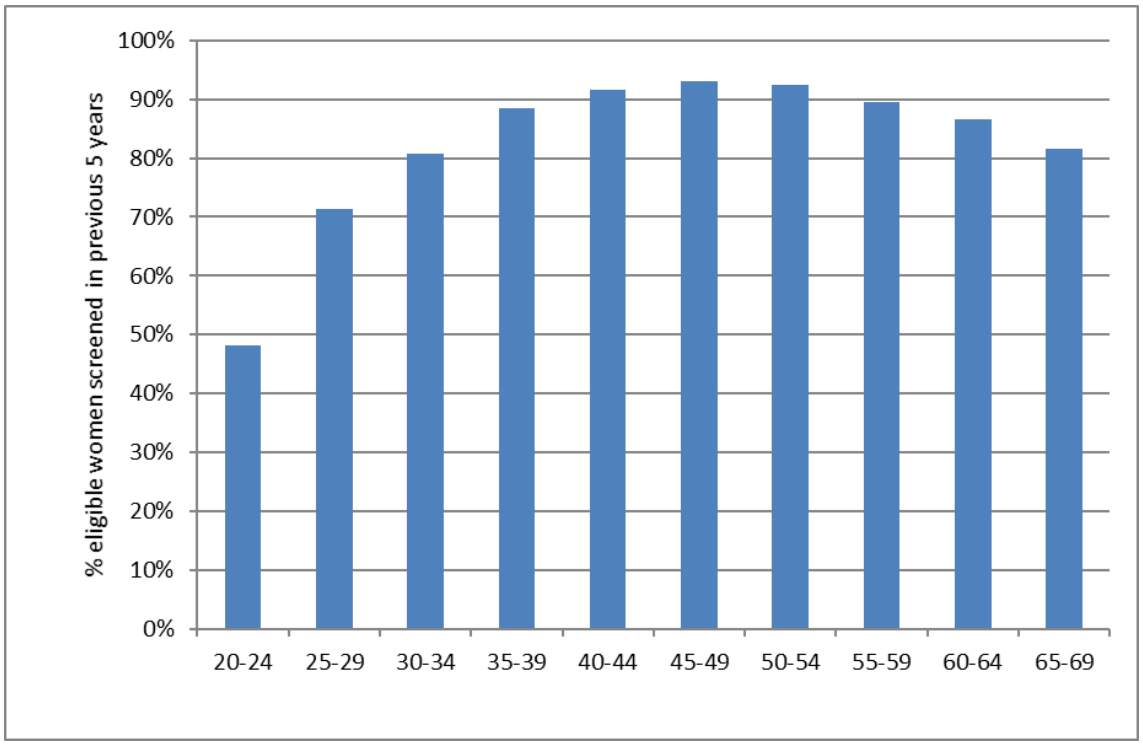
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 9 - Five-year coverage by DHB (women screened in the five years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population)



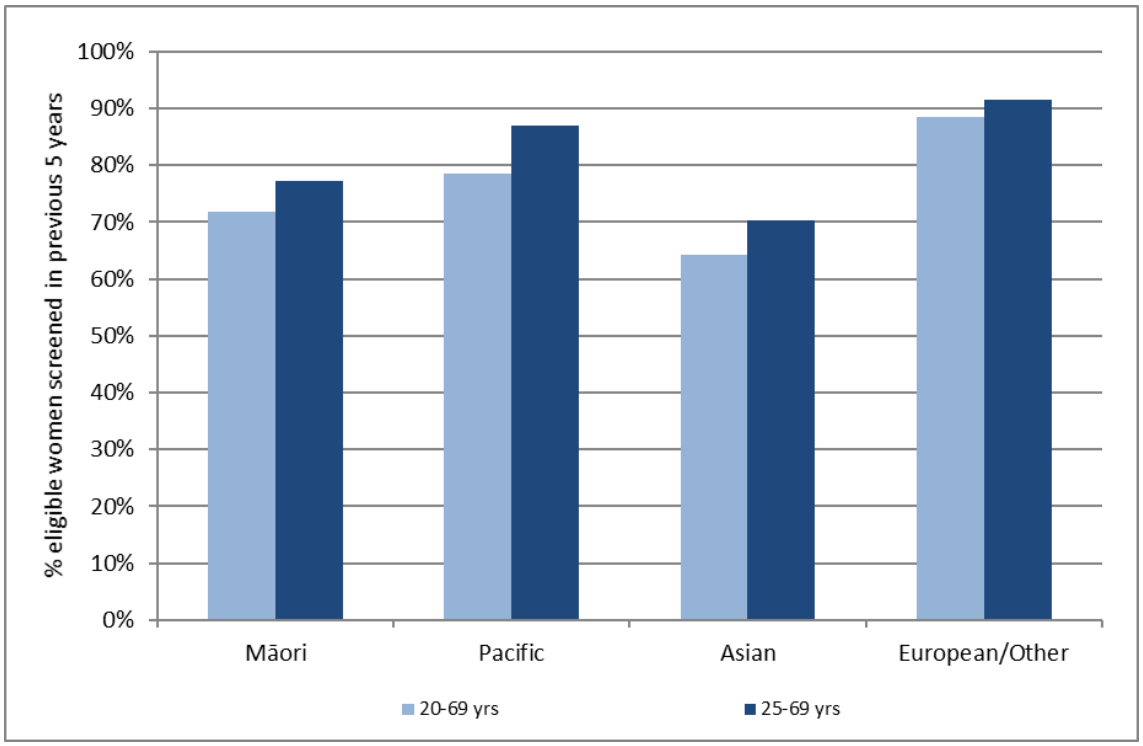
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. See also Table 26.

Figure 10 - Five-year coverage by five-year age-group (women screened in the five years prior to 31 December 2018, as proportion of hysterectomy-adjusted female population)



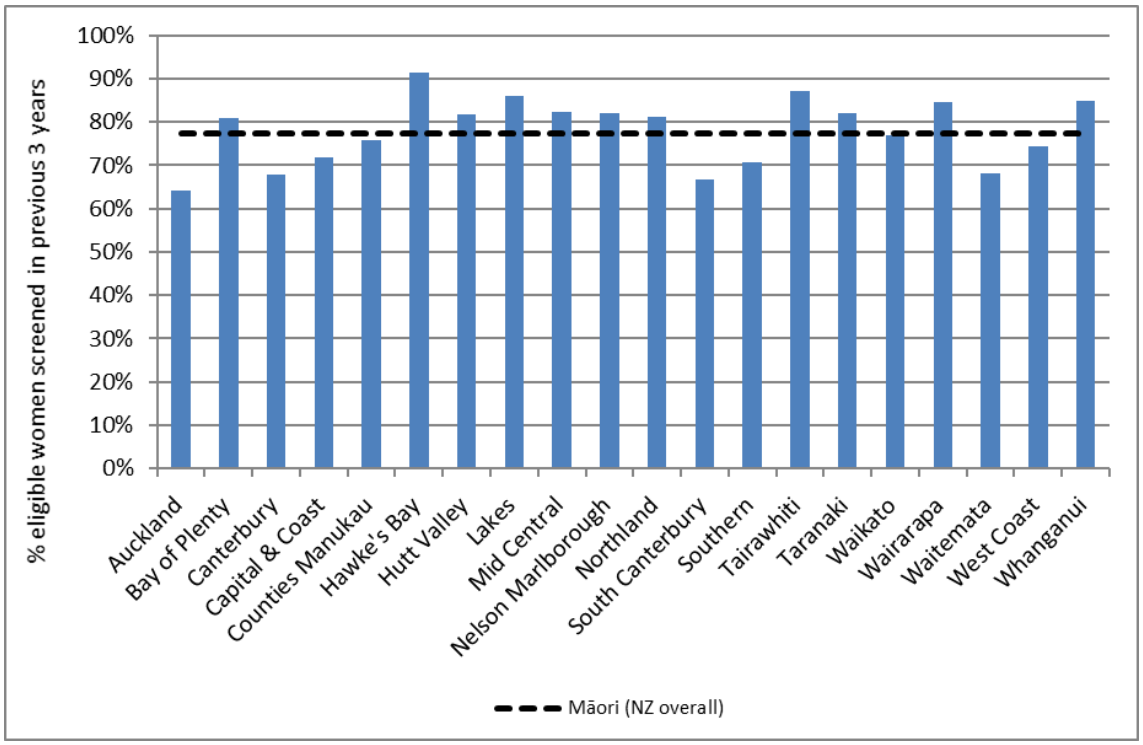
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data. See also Table 30.

Figure 11 - Five-year coverage by ethnicity (women screened in the five years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population)



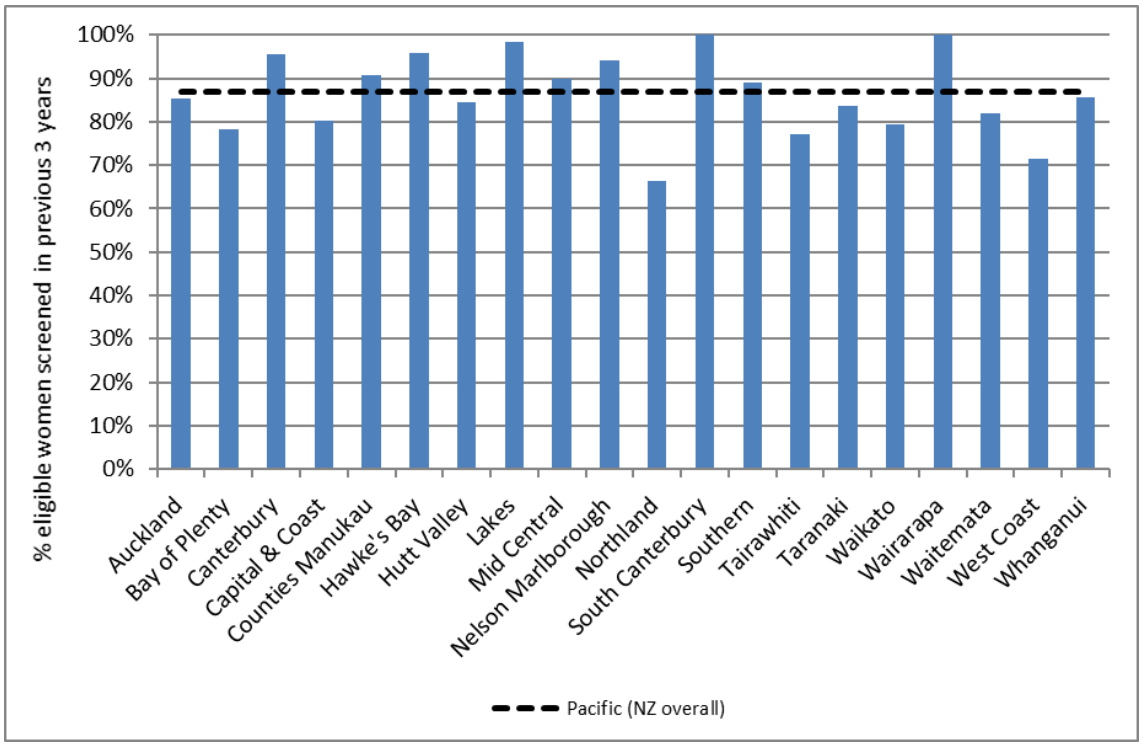
Note: Coverage calculated using population projection for based on 2013 Census data. See also Table 29.

Figure 12 - Five-year coverage in Māori women (women 25-69 years screened in the five years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



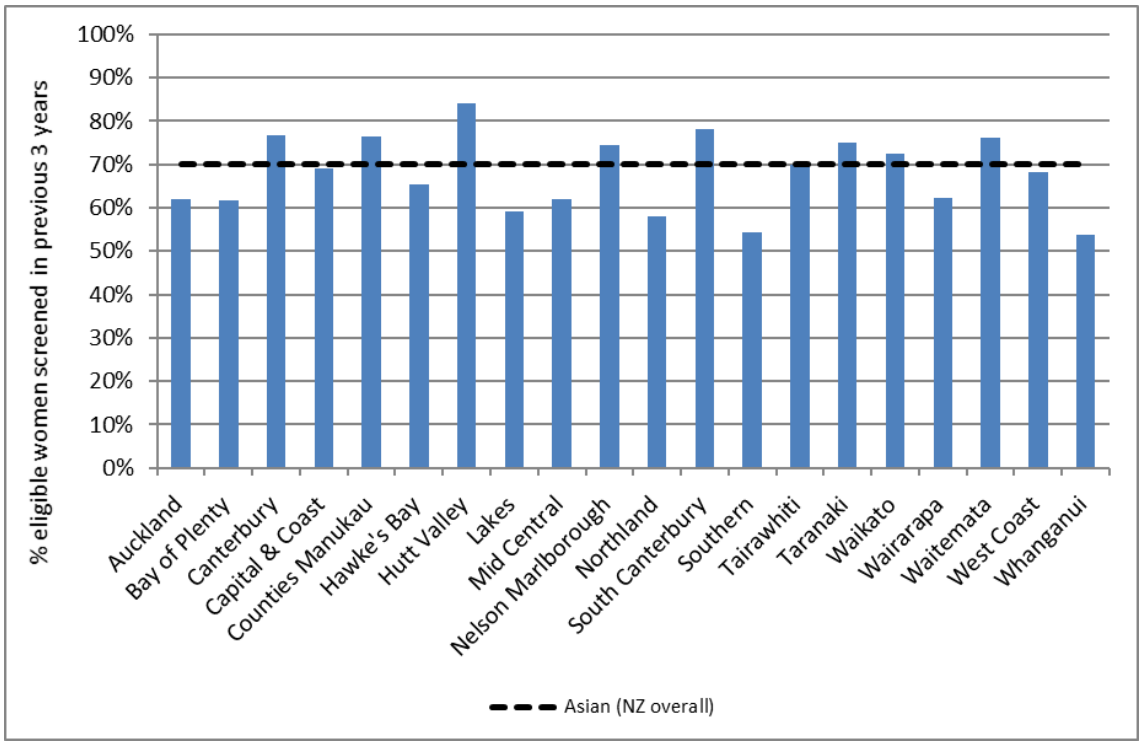
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data.

Figure 13 - Five-year coverage in Pacific women (women 25-69 years screened in the five years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



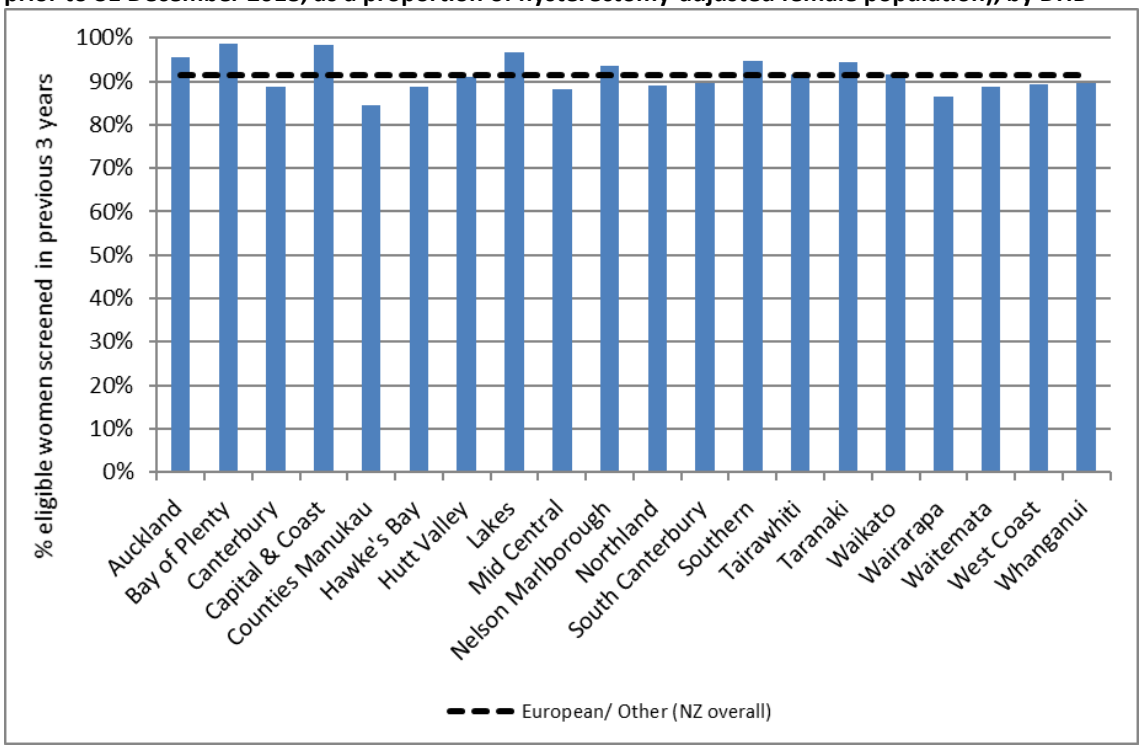
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data.

Figure 14 - Five-year coverage in Asian women (women 25-69 years screened in the five years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



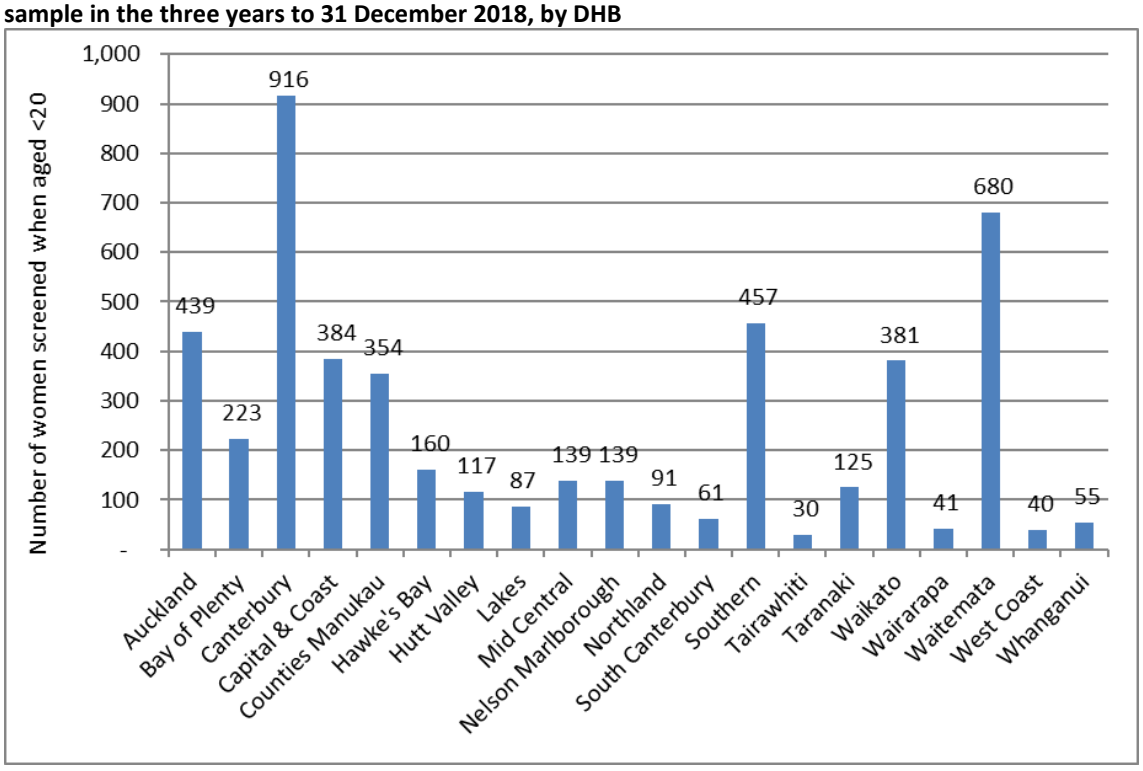
Note: Coverage calculated using population projection for 31 December 2018 based on 2013 Census data.

Figure 15 - Five-year coverage in European/ Other women (women 25-69 years screened in the five years prior to 31 December 2018, as a proportion of hysterectomy-adjusted female population), by DHB



Note: Coverage calculated using population projection for 31 December 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 31 December 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)*

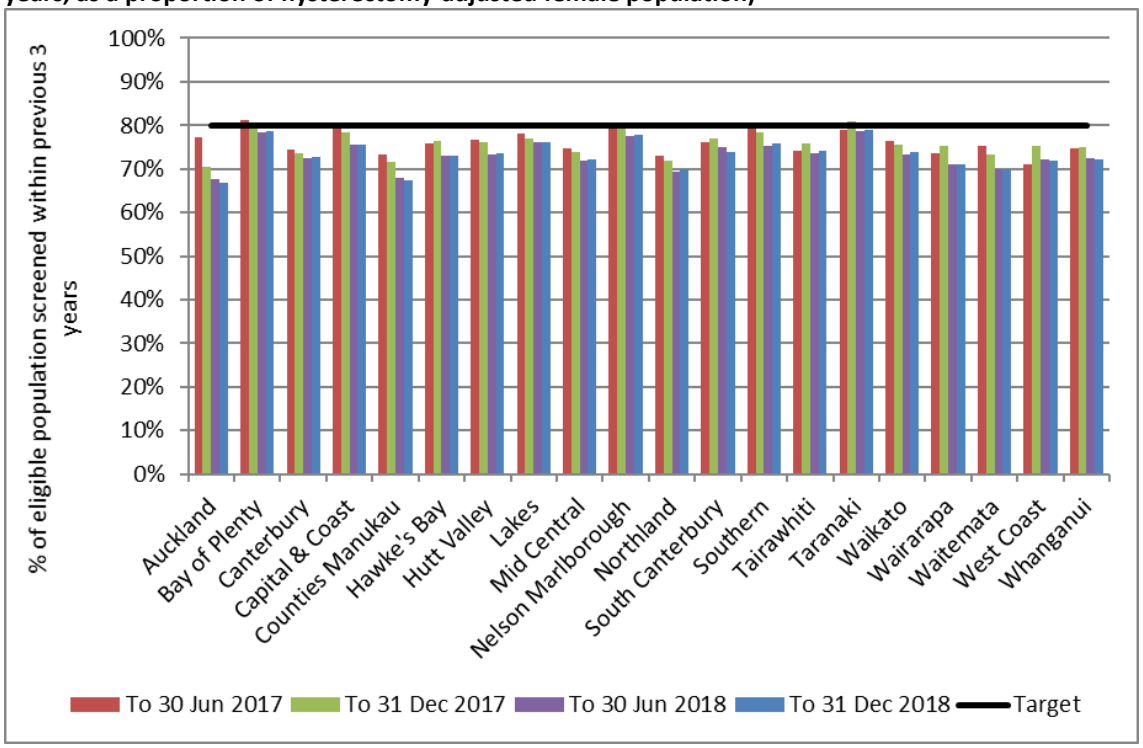


Figure 18 - Trends in three-year coverage by age (women screened in the previous three years, as a proportion of hysterectomy-adjusted female population)*

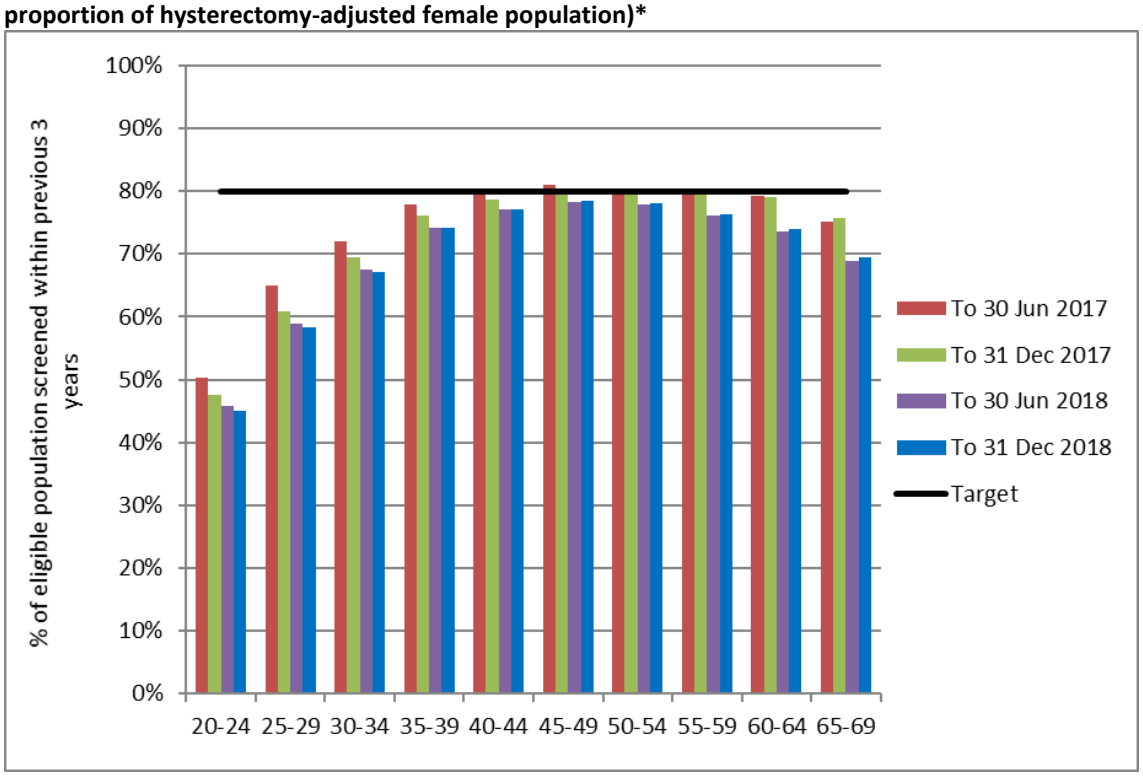
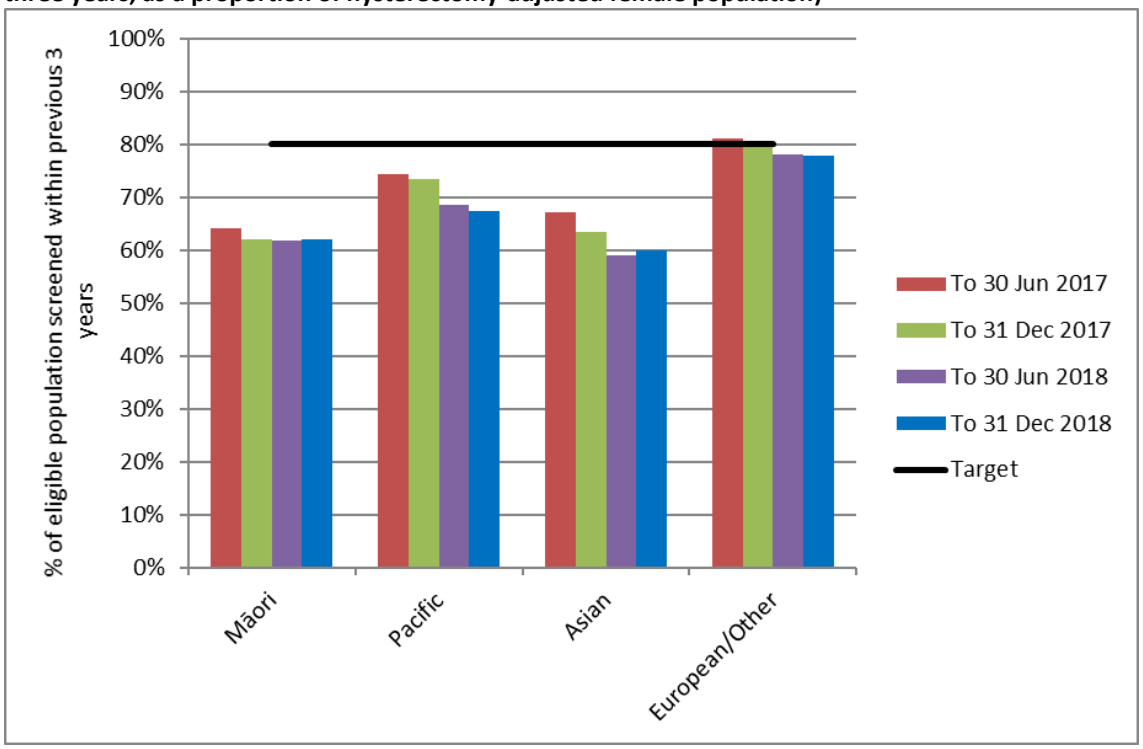
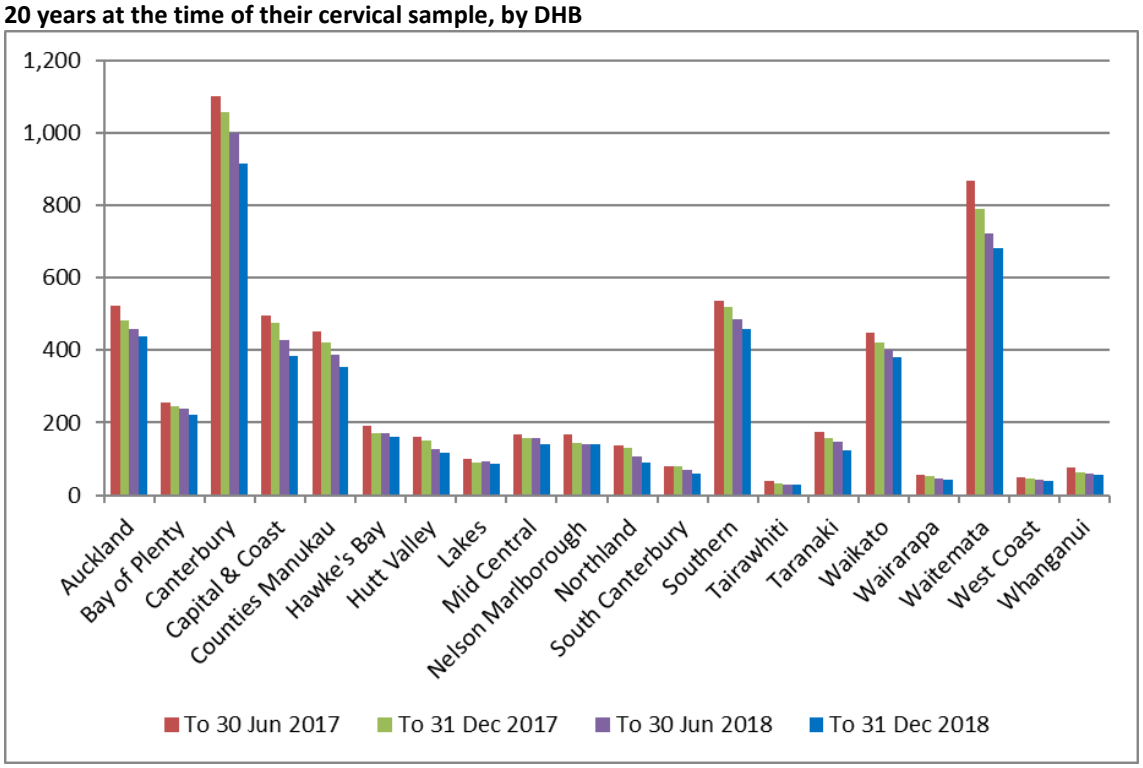


Figure 19 - Trends in three-year coverage by ethnicity (women aged 25-69 years screened in the previous three years, as a proportion of hysterectomy-adjusted female population)*



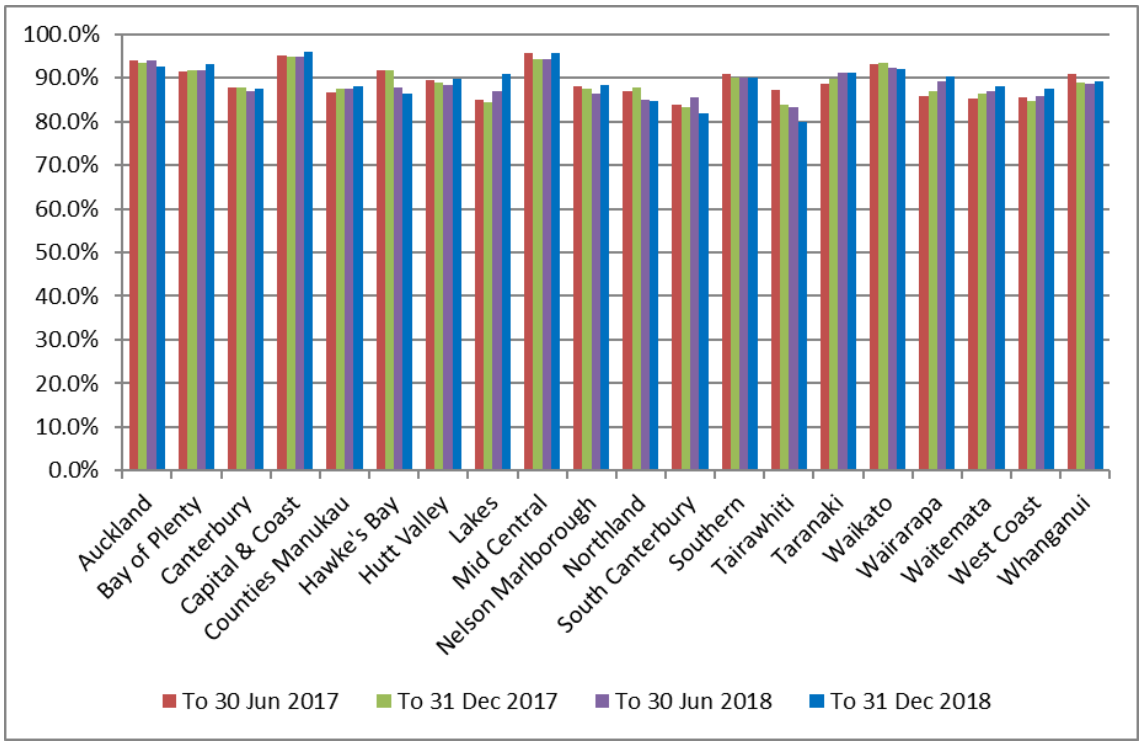
**Note: Coverage calculated using population projection at the date shown based on 2013 Census data. Updated population and hysterectomy 2013 Census population projection was used to calculate coverage for 31 December 2018. Original population projection estimates were used to calculate coverage for 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 9-15 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.

The measure is calculated by constructing a reference cohort consisting of satisfactory cytology samples ("reference samples") collected from women aged 20-69 years in the five years prior to the end of the current monitoring period (31 December 2018).

The most recent satisfactory cytology sample from these women prior to the reference sample was identified on the NCSP Register. The recommendation code of these prior samples was used to classify the reference samples as either early, on-time, or late. Only reference samples where the prior sample indicated an expected screening interval or either three years (recommendation code R1 or B2B0) or 12 months (recommendation code R6, R7, R8, B2B7, B2B7A, or B2B7H) were included. Reference samples where no prior satisfactory cytology sample was identified on the register with a collection date of 1 January 2000 or later, or where the prior sample had any other recommendation code, were excluded from the analysis. These women were either under specialist management, had an expected screening interval of less than 12 months, or there was insufficient information to infer an expected screening interval. Reference samples collected at colposcopy were also excluded as these may have arisen in relation to symptoms or other clinical indications.

Results are presented based on the quarter of the year the reference cytology sample was collected. Therefore, a result for the first quarter of 2018 reports the percentage of women who attended for screening within that quarter who were attending either early, on-time or late in relation to the recommendation associated with their prior cytology test (i.e. the total of these three categories in each quarter sums to 100%).

	For this measure age relates to the woman's age on the date of her reference cytology sample (i.e. the attendance which is classified as either early, on-time or late).
Target	Not yet defined, however aim to maximise on-time attendance.
Current Situation	In total over the period 2014-2018, satisfactory cytology samples were collected from 1,229,118 women aged 20-69 years (based on their age at the time of the sample). Of these, 1,099,005 women met all inclusion criteria and 1,708,661 cytology samples collected from these women are included as reference cytology samples for analysis in this report. This section will focus on the results for the 12 months prior to the end of the current monitoring period (31 December 2018), while trends over the past five years are described in the *Trends* section. ***Routine screening (3-year recall)*** Among women attending for screening in 2018 following a 3-year recall recommendation, 63.0% were attending on-time; 12.0% more than six months early; and 24.9% more than six months late (Figure 22). *By ethnicity* The proportion of women re-attending in 2018 who were on-time was highest for European/ Other (64.6%), and lowest in Pacific women (54.6%). The proportion of women returning for routine screening who were re-attending early was highest for Asian women (12.5%) and lowest for Pacific women (9.5%). The proportion of women screened who were re-attending later than recommended was highest for Pacific women (36.0%), and lowest for European/ Other women (23.1%; Figure 23). Details of the number of re-attendances in each category are shown in (Table 40). *By age* The proportion of women attending for screening in 2018 who were re-attending on-time was highest for women aged 60-69 years (72.1%) and lowest for women aged 30-39 years (56.2%). The proportion of women who were re-attending early, ranged from 7.8% (60-69 years) to 19.1% (20-29 years). The proportion of women screened who were re-attending later than recommended was highest for women aged 30-39 years (30.6%) and lowest for women aged 60-69 years (20.1%; Figure 24). Details of the number of re-attendances in each category are shown in (Table 41). ***12-month re-screening*** Among women attending for in 2018 following a 12-month repeat recommendation, 38.2% were attending on-time; 2.2% screening more than three months early; and 59.6% more than three months late (Figure 25). *By ethnicity* The proportion of women re-attending in 2018 who were on-time was highest for Asian (41.4%), and lowest in Pacific women (27.4%). The proportion of women returning for 12-month repeat screening who were re-attending early

was very small in all groups, but was highest for European/ Other women (2.5%) and lowest for Pacific women (1.6%). The proportion of women screened who were re-attending later than recommended was relatively high in all groups, but was highest for Pacific women (71.0%), and lowest for Asian women and European/ Other women (56.9% Figure 26). Details of the number of re-attendances in each category are shown in (Table 42).

By age

The proportion of women attending for screening in 2018 following a 12-month repeat recommendation who were re-attending on-time was highest for women aged 20-29 years (43.4%) and lowest for women aged 30-39 years (33.6%). Very few women were re-attending early; this ranged from 1.7% (50-59) to 2.6% (20-29 years). The proportion of women screened who were re-attending later than recommended was over 50% in all age groups, but was highest for women aged 30-39 years (64.4%) and lowest for women aged 20-29 years (54.0%; Figure 27). Details of the number of re-attendances in each category are shown in (Table 43).

Trends

Routine screening (3-year recall)

Over the period 2014 to 2018, the proportion of women who were screened on-time increased from 60.5% to 63.0%. This predominantly reflected a reduction in the proportion of women who were being screened early (fell from 17.7% to 12.0%). There was an increase in the proportion of women who were returning late (from 21.8% to 24.9%; Figure 28).

By ethnicity

Over the period 2014 to 2018, the proportion of women who were screened on-time increased in three of the four ethnic groups, with the increase being largest in Asian women and a slight decrease, from 54.7% in 2014 to 54.6% in 2018, in Pacific women. In all groups, this predominantly reflected a reduction in the proportion of women who were being screened early, as this fell in all groups. There were also increases in the proportion of women who were returning late in every group (Table 44). The proportion returning late was consistently higher in Māori and Pacific women than in Asian and Euroepan/Other women (Figure 29).

By age

Over the period 2013 to 2017, the proportion of women who were screened on-time increased in all age groups, with the increase being largest in women aged 20-29 years. In all groups, there was a substantial reduction in the proportion of women who were being screened early, however there was also a small increase in the proportion of women who were returning late (Table 45). The proportion of women returning late was consistently highest for women aged 30-39 years, and consistently lowest for women aged 60-69 years. On-time screening tended to increase with increasing age, and was consistently highest in women aged 60-69 years. On-time screening was consistently lower for women aged 20-29 years at the beginning of the 5-year period and by the

end of the observation period the proportion of women that attended screening on-time is similar to the 30-39 age group (Figure 30).

12-month re-screening

Over the period 2014 to 2018, the proportion of women who were re-attending on-time for 12-month follow-up decreased somewhat, from 43.2% in 2014 to 38.2% in 2018, as did the proportion who were re-attending more than three months early, which decreased from 3.3% to 2.2%. There was a corresponding increase in the proportion of women who were re-attending more than 15 months after a recommendation to return in 12 months, which increased from 53.5% in 2014 to 59.6%. This means that over the entire period 2014-2018, the majority of women who were re-attending after a recommendation to return in 12 months were re-attending more than three months later than recommended (Figure 31).

By ethnicity

Over the period 2014 to 2018, the proportion of women who were re-attending on-time for 12-month follow-up decreased in all ethnic groups, as did the proportion who were re-attending early. The proportion of women who were re-attending at more than 15 months after a recommendation to return at 12 months increased in all ethnic groups, with a minimum increase of 4.9% in Pacific women (66.0% in 2014 to 71.0% in 2018) and a maximum increase of 6.1% in Māori and European/ Other women (62.9% and 50.8% in 2014 to 69.0% and 56.9% in 2018, respectively). The proportion of women returning less than nine months after a recommendation to return in 12 months was generally small and similar in all groups, however the proportion returning on-time was consistently higher in Asian and European/ Other women than in Māori and Pacific women. Conversely, the proportion who were re-attending more than 15 months after a recommendation to return in 12 months was consistently higher in Māori and Pacific women than in Asian and European/ Other women. By 2018, and in all ethnic groups, the majority of women who were re-attending after a recommendation to return in 12 months were re-attending more than three months later than recommended (Figure 32).

By age

Over the period 2014 to 2018, the proportion of women who were re-attending on-time and early for 12-month follow-up decreased in all age groups. The proportion of women who were re-attending at more than 15 months after a recommendation to return at 12 months increased in all age groups, but the increase was comparatively small in women aged 20-29 years (2.8% increase between 2014 and 2018), whereas it ranged from 5.1% (30-39 years) to 10.7% (60-69 years) in women in older age groups. The proportion of women returning less than nine months after a recommendation to return in 12 months was very small and broadly similar in all age groups, however the proportion returning on-time was highest in women aged 60-69 years in 2014 but highest in women aged 20-29 in 2018. The proportion re-attending on-time was consistently lowest in women age 30-39 years, although in 2018 the proportion was comparably low in women aged 40-49 years. The proportion who were re-attending more than 15 months after a recommendation to

return in 12 months was generally highest in women aged 30-39 years and 40-49 years. The proportion returning late was initially lowest in women 60-69 years, but this proportion increased in this age group over the time period, and so by 2018 the proportion returning at least 3 months late was lowest in women aged 20-29 years. By 2018, and in all age groups, the majority of women who were re-attending after a recommendation to return in 12 months were re-attending more than three months later than recommended (Figure 33).

Comments

This indicator is reported in every second monitoring period to allow for the full year to be examined. It has been included in the biannual monitoring report since Report 44 (July – December 2015). Earlier versions of regularity of screening were included in the NCSP Annual Reports for 2012 and 2013, however this indicator has been moved to the biannual reports for easier comparison with other screening-related indicators. The NCSP Annual Reports now contain cancer (incidence and mortality) data only, and all screening-related indicators are in biannual reports.

This indicator reports on regularity of screening among women who have attended for screening; however, it does not capture women who have not attended for screening at all. Indicator 1.1, Coverage, is able to provide some insight into the overall proportion of women who have not attended (for example, those not screened in the previous five years).

Indicators 1.2 and 4 both examine women recommended to return at the routine interval of three years who return early. The difference between these indicators are the women observed (cohorts) and how proportions are calculated. Indicator 4 identifies women with a cytology test taken in a specific earlier time period (between 1 February – 31 March 2016 in the current report) with a recommendation that the next test should be taken at the usual screening interval of three years ("routine screening"). Women with a subsequent cytology test taken within 30 months (i.e. at least six months early) are then identified – that is, this is a prospective investigation of all women within an historical cohort, including those who have re-attended, and those who have not. As described above, Indicator 1.2 identifies cytology tests within specific time periods (e.g. October - December 2018), then identifies the recommendation associated with the immediately preceding cytology test in each woman (whenever that occurred), and assesses whether the woman was returning early, on-time, or late. The proportion reported is women attending in the given time period who are attending for routine screening at least six months early, as a proportion of all women re-attending for routine screening in the same time period. That is, Indicator 1.2 is a proportion of women attending in the relevant time period (and does not take into account women not attending for screening), and it 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?*". Indicator 4 takes into account all women who were given the recommendation to return at the routine interval, regardless of whether they return or not. It addresses the question – "*What*

proportion of women recommended to return in three years for routine screening return at least six months early?"

Figure 22 - Timeliness of re-attendance in 2018 following a routine (3-year) repeat screening recommendation

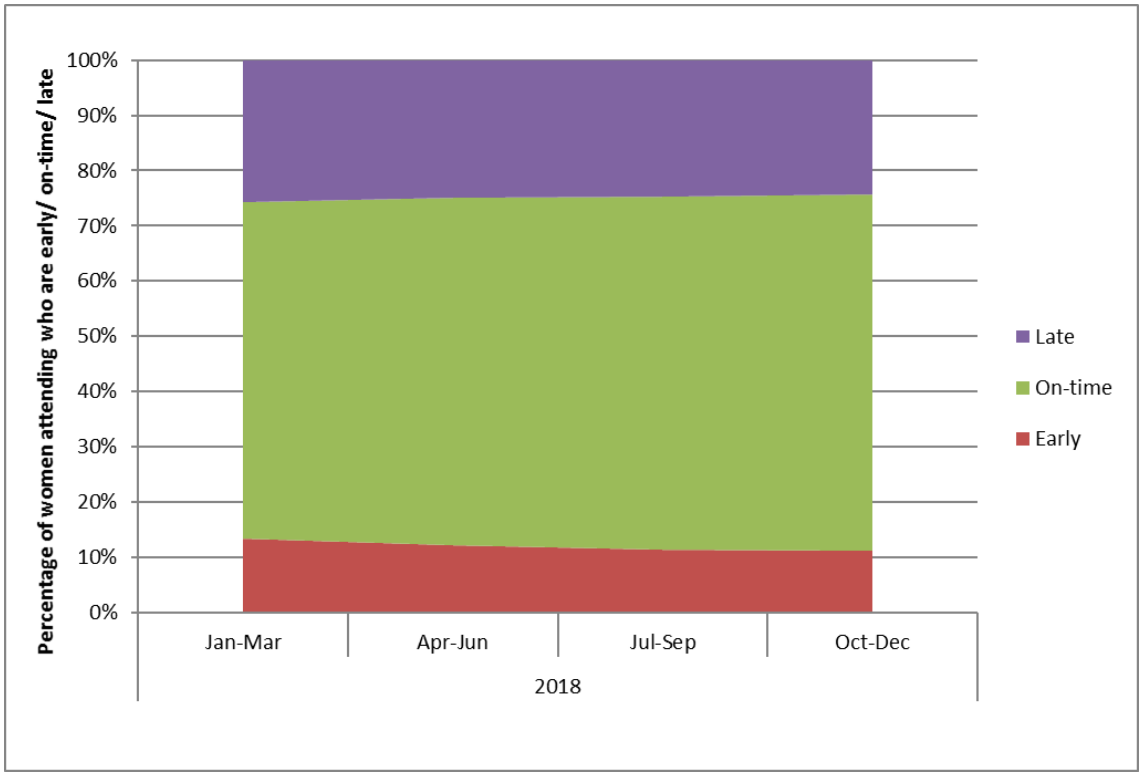


Figure 23 - Timeliness of re-attendance following a routine (3-year) repeat screening recommendation among women re-attending for screening in 2018, by ethnicity

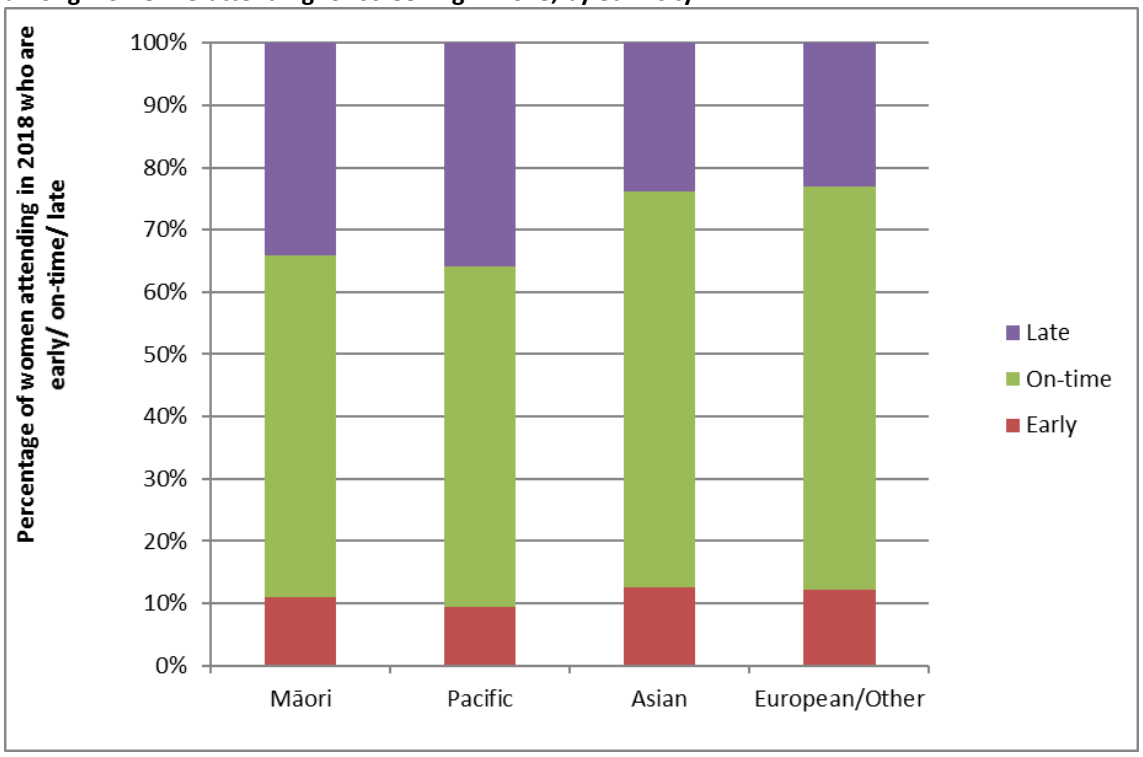


Figure 24 - Timeliness of re-attendance in 2018 following a routine (3-year) repeat screening recommendation among women re-attending for screening in 2018, by age

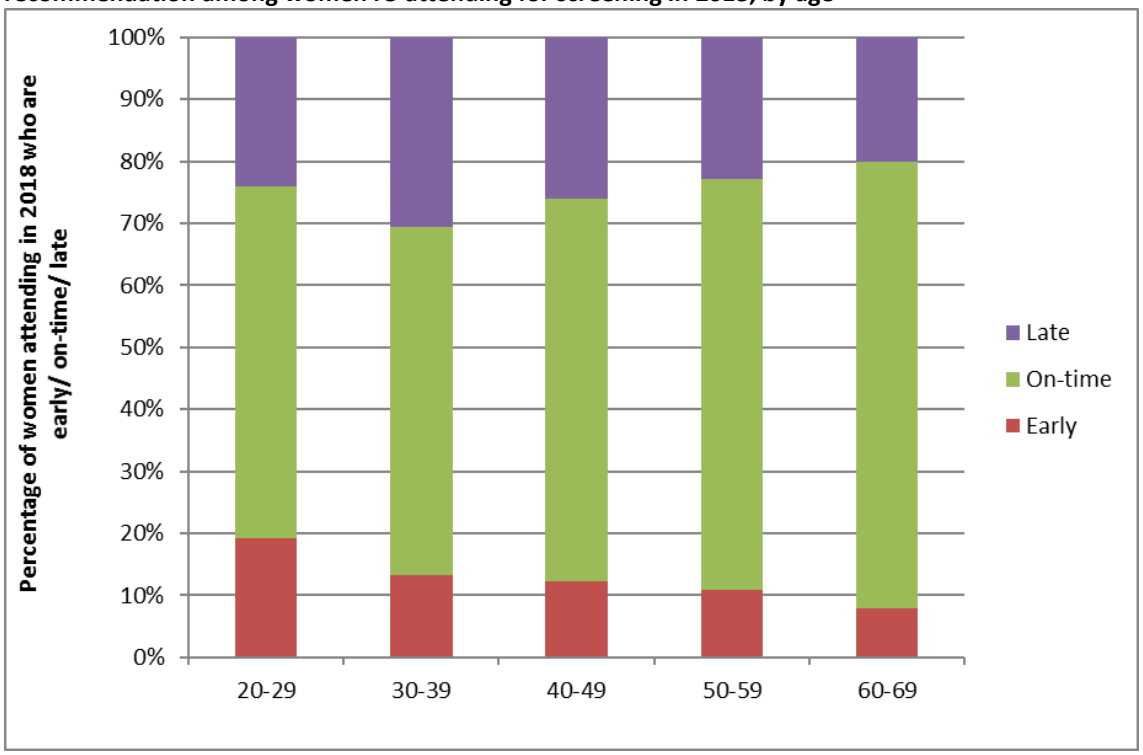


Figure 25 - Timeliness of re-attendance among women re-attending for screening in 2018 following a 12-month repeat screening recommendation

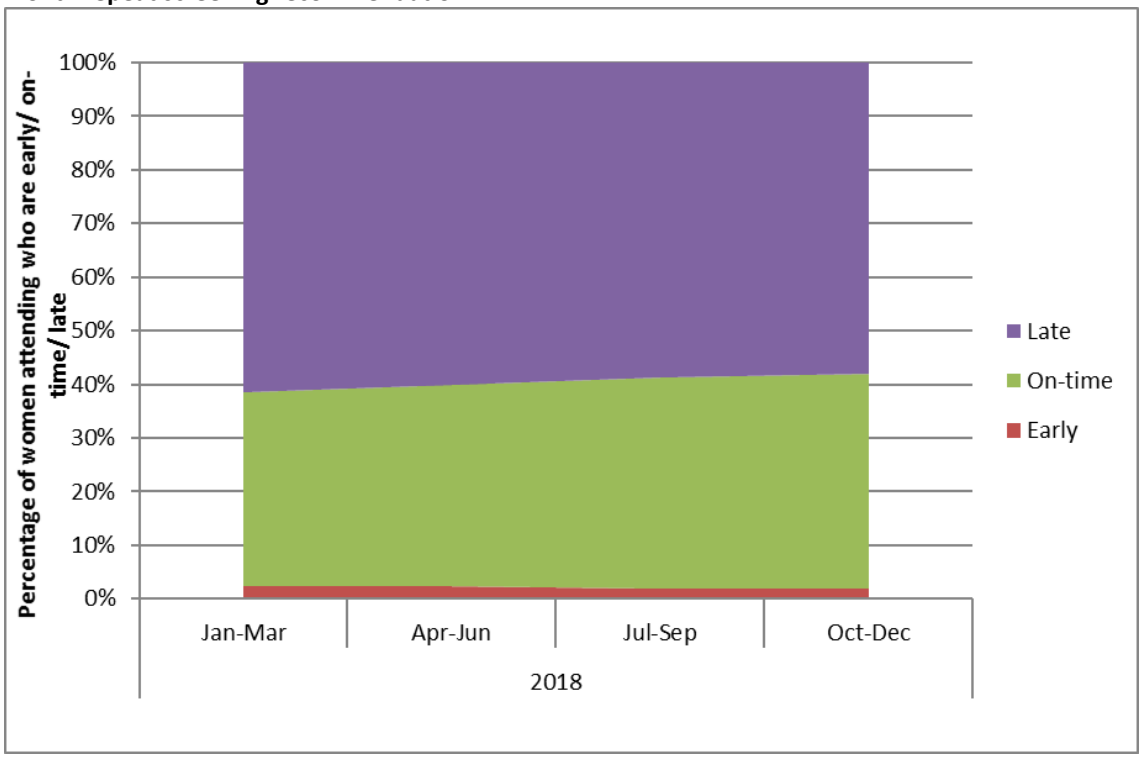


Figure 26 - Timeliness of re-attendance among women re-attending for screening in 2018 following a 12-month repeat screening recommendation, by ethnicity

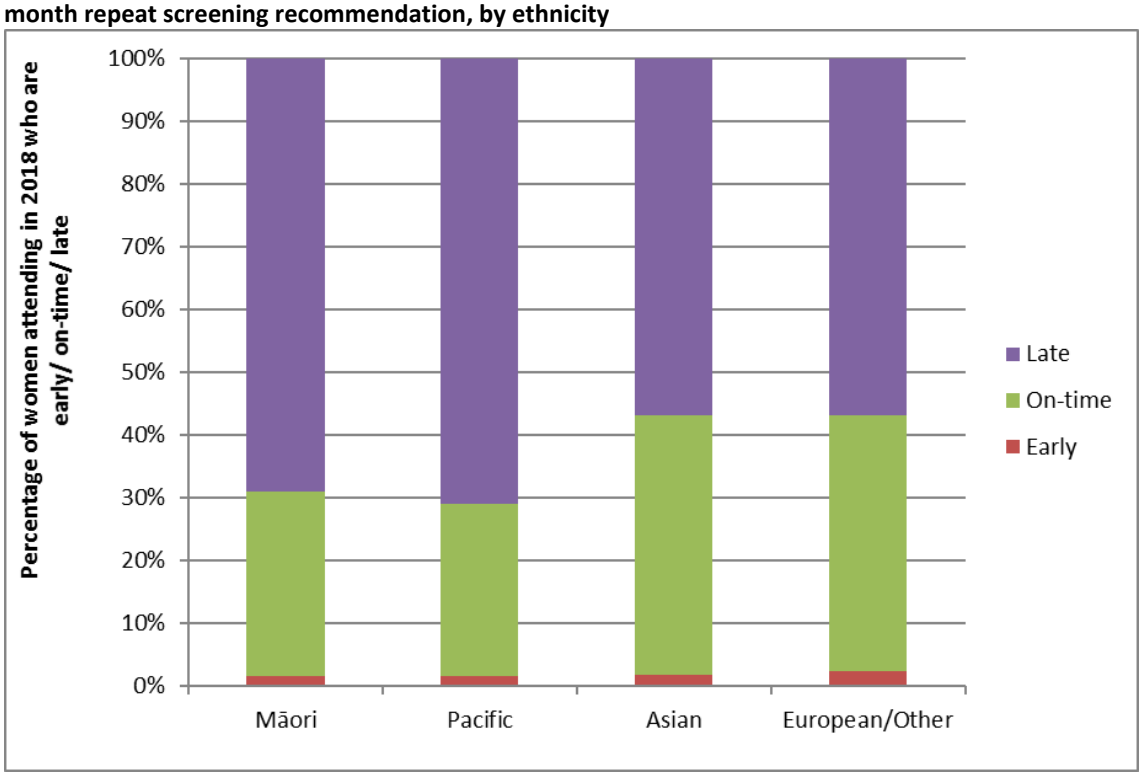


Figure 27 - Timeliness of re-attendance among women re-attending for screening in 2018 following a 12-month repeat screening recommendation, by age

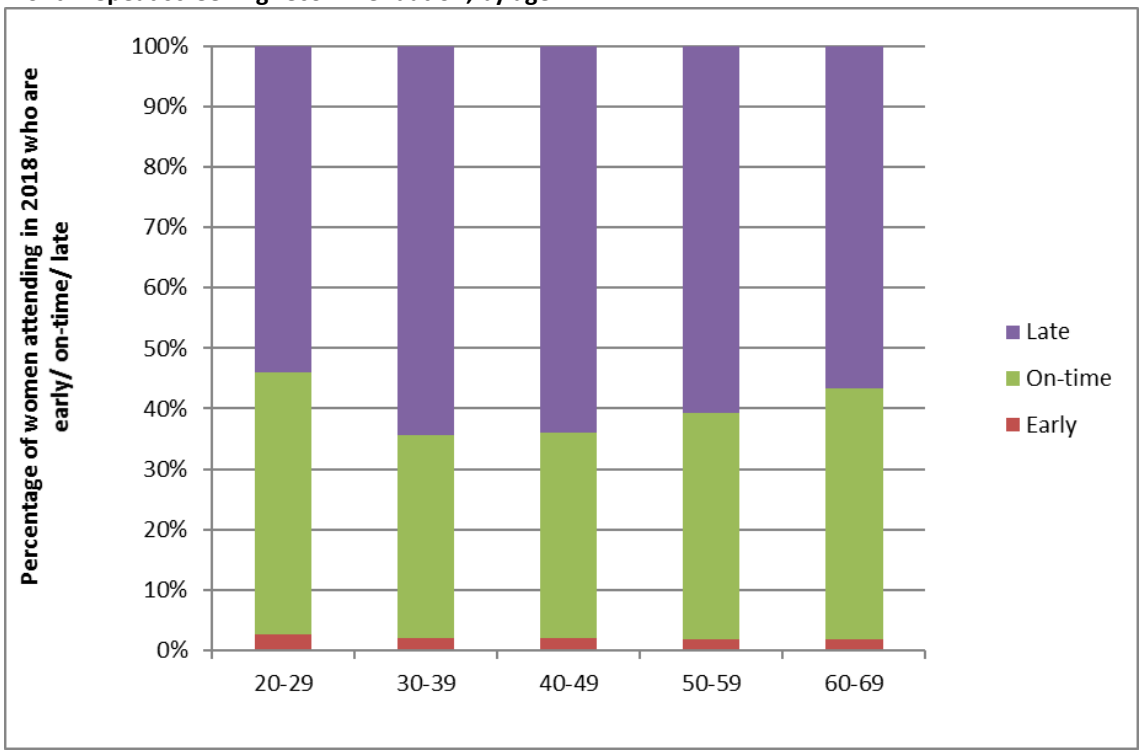


Figure 28 - Trends in the timeliness of re-attendance following a routine (3-year) repeat screening recommendation

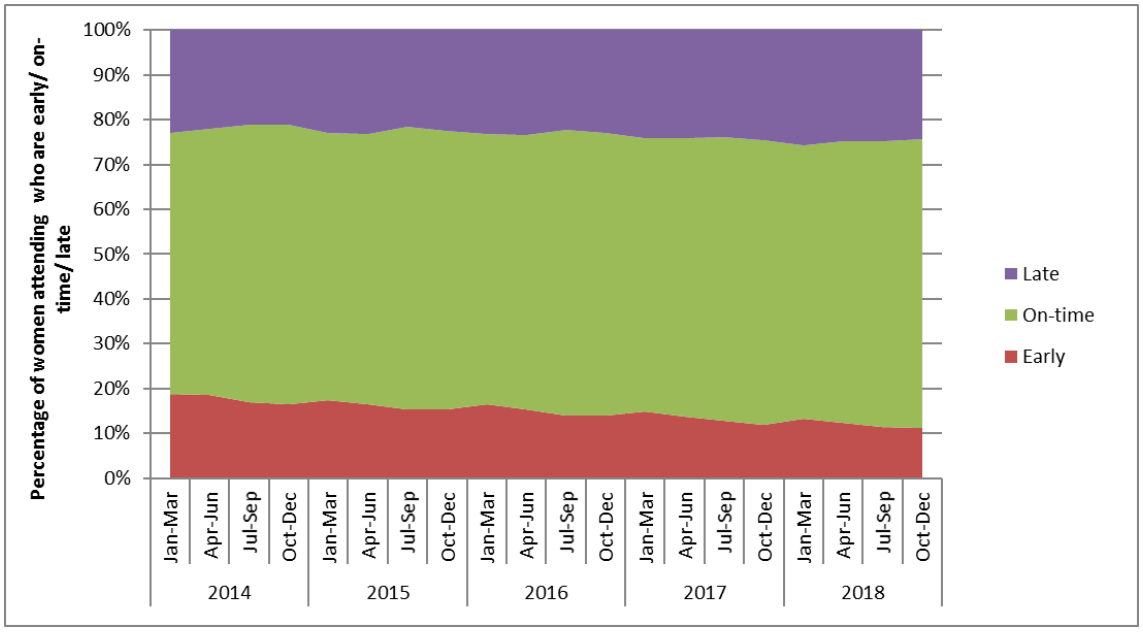


Figure 29 - Timeliness of re-attendance following a routine (3-year) repeat screening recommendation (percent), 2014-2018, by ethnicity

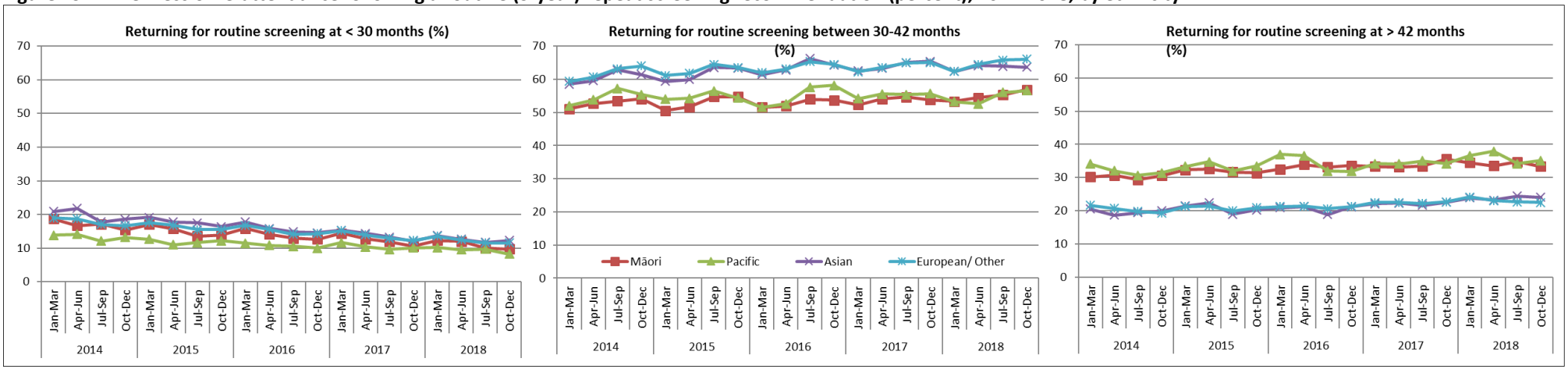


Figure 30 - Timeliness of re-attendance following a routine (3-year) repeat screening recommendation (percent), 2014-2018, by age

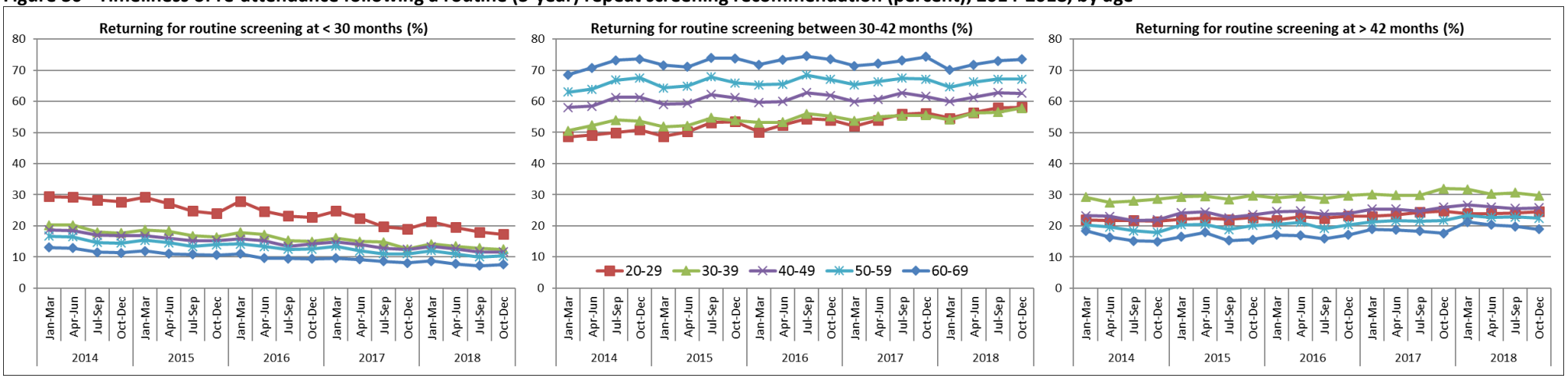


Figure 31 - Trends in the timeliness of re-attendance following a 12-month repeat screening recommendation

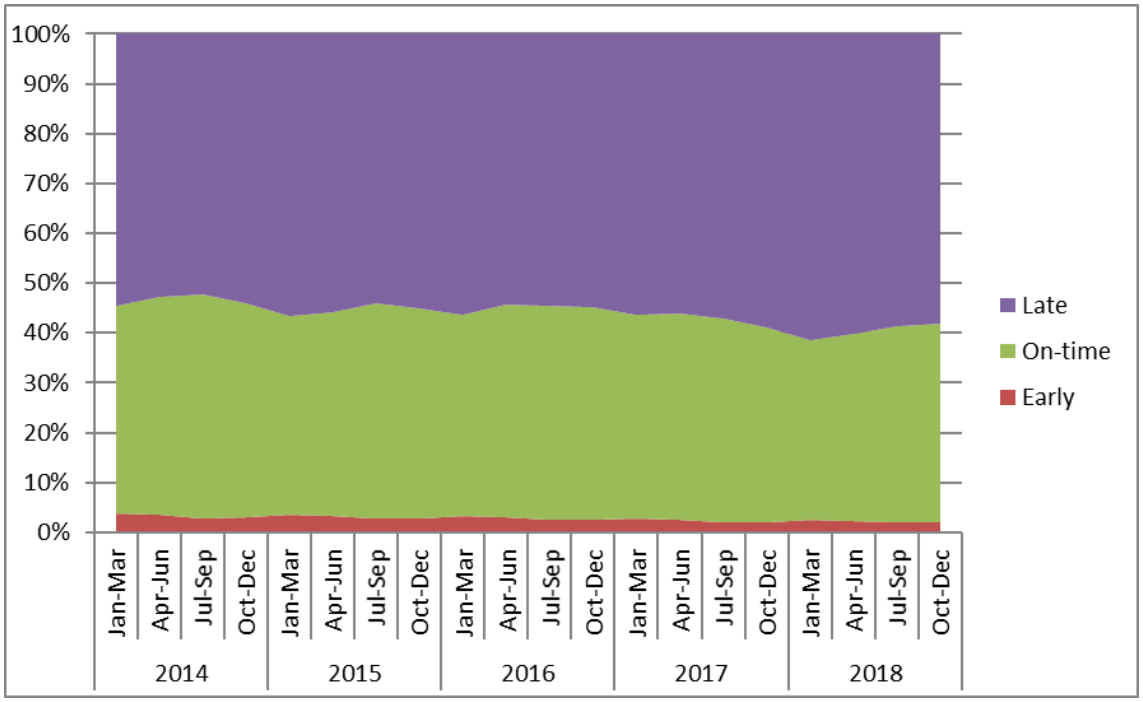


Figure 32 - Timeliness of re-attendance following a 12-month repeat screening recommendation (percent), 2014-2018, by ethnicity

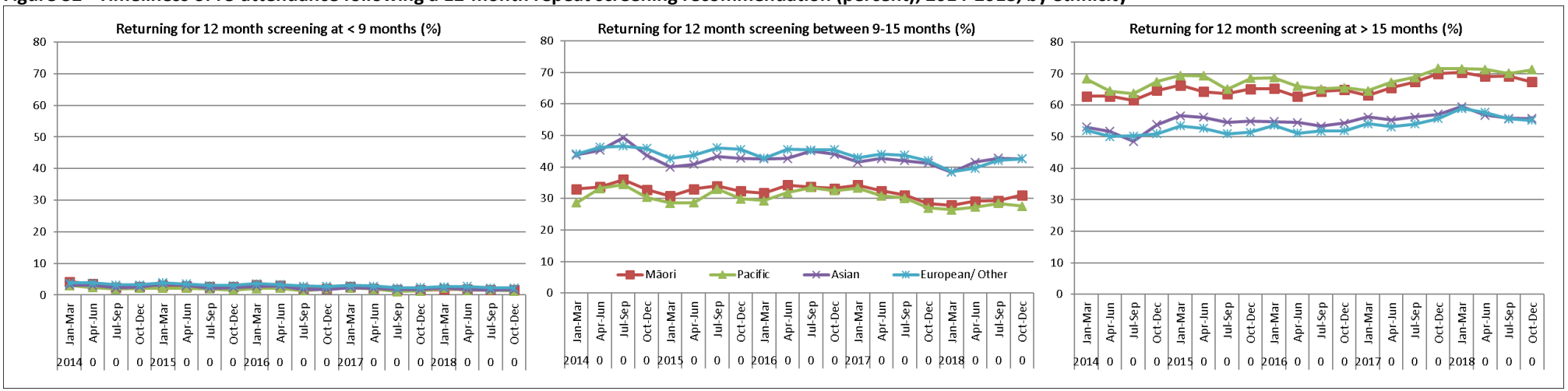
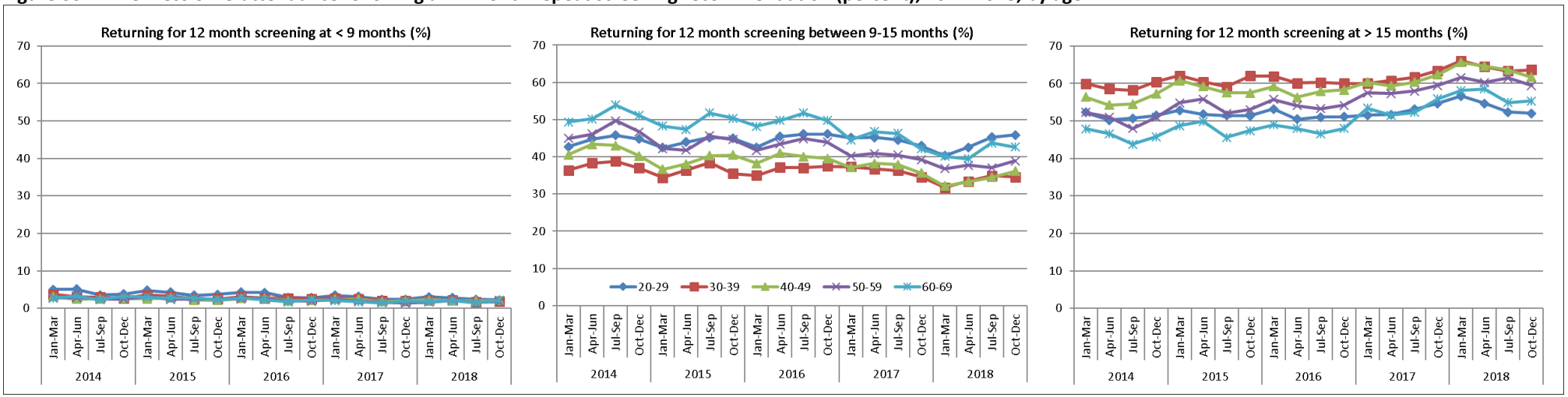


Figure 33 - Timeliness of re-attendance following a 12-month repeat screening recommendation (percent), 2014-2018, by age



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 31 December 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 23,919 women aged 20-69 years at the end of the period who had their first screening event in the period 1 July - 31 December 2018. This constituted 11.2% of the 212,668 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 (25% (Q1) and 75% (Q3): 21-34 years) for all women; 22 (20 to 25) years for Māori women; 25 (22 to 33) years for Pacific women; 31 (27 to 38) years for Asian women; and 24 (21 to 32) years European/ Other women.

The age group with the highest number of first screening events was women aged 20-24 years. There were 10,163 women aged 20-24 who had their first screening event recorded on the register during this monitoring period, accounting for 42.5% of all women aged 20-69 years with first screening events (Figure 34, Table 46). 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 (45.6%; Figure 35, Table 47) and the highest proportion of the eligible population at that age with a first screening event recorded in the current monitoring period (6.0%; Figure 124).

The DHBs with the highest number of women aged 20-69 years with first screening events were Auckland (3,567) and Waitemata (3,257). The DHBs where women with first screening events, as a proportion of all women with screening events, were the highest in Auckland (14.8%) followed by Counties Manukau (14.0%) and Capital & Coast (13.3%). The DHBs where this proportion was lowest were West Coast (6.3%), Wairarapa (7.0%) and Taranaki (7.2%; Figure 36, Table 48).

The ethnic group with the highest number of women with first screening events was European/ Other (12,370 women; Figure 37, Table 49). The group with the highest proportion of their eligible population being screened for the first time was Asian (2.9%), and the lowest was Māori women (1.2%; Table 49). The proportion of women

screened who were being screened for the first time was highest for Asian women (23.3%; Figure 37, Table 49). 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 50).

Trends

The number of women with a first screening event recorded on the NCSP Register is higher; from 22,911 women in the previous period to 23,919 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 the same in this period (1.6%) as 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 decrease in the number of first screens was seen in women aged 20-29 years. The number of women with first screening events increased in Asian and Pacific 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 31 December 2018 are shown in Figure 38 (by age), Figure 39 (by DHB), and Figure 40 (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 34 - Women with first screening events during the monitoring period, by five-year age group (women aged 20-69 years at 31 December 2018)

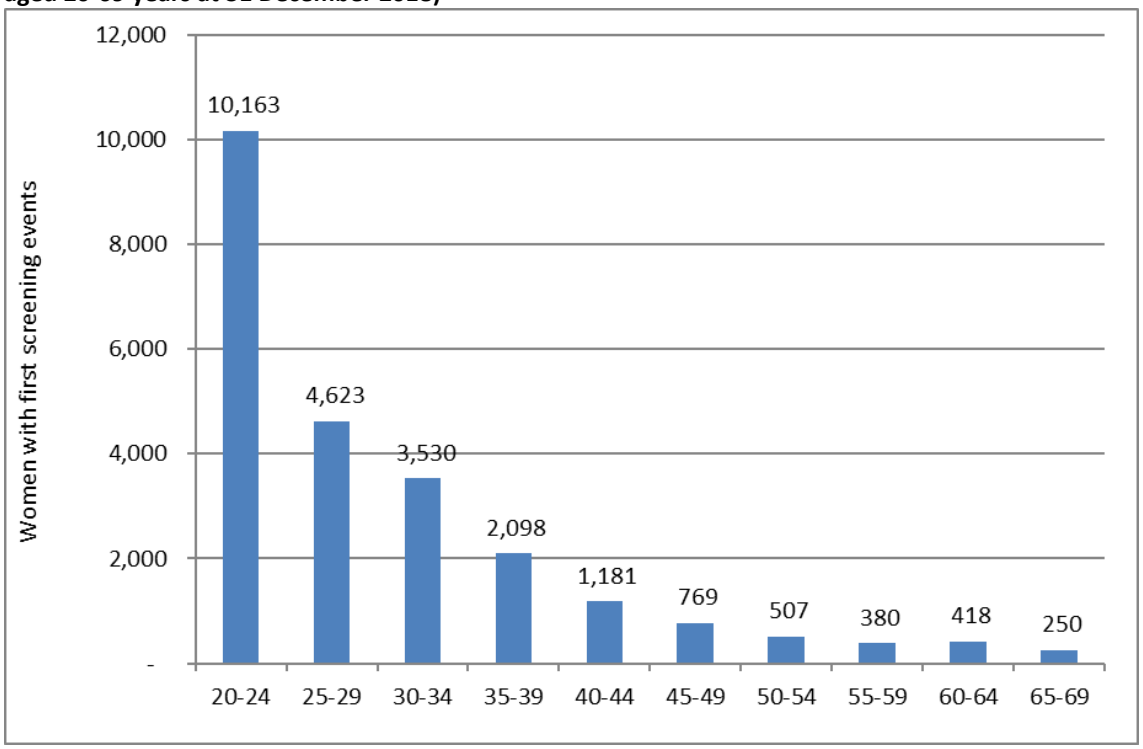


Figure 35 - Women with first screening events as a proportion of all women screened in that age group during the monitoring period, by five-year age group (women aged 20-69 years at 31 December 2018)

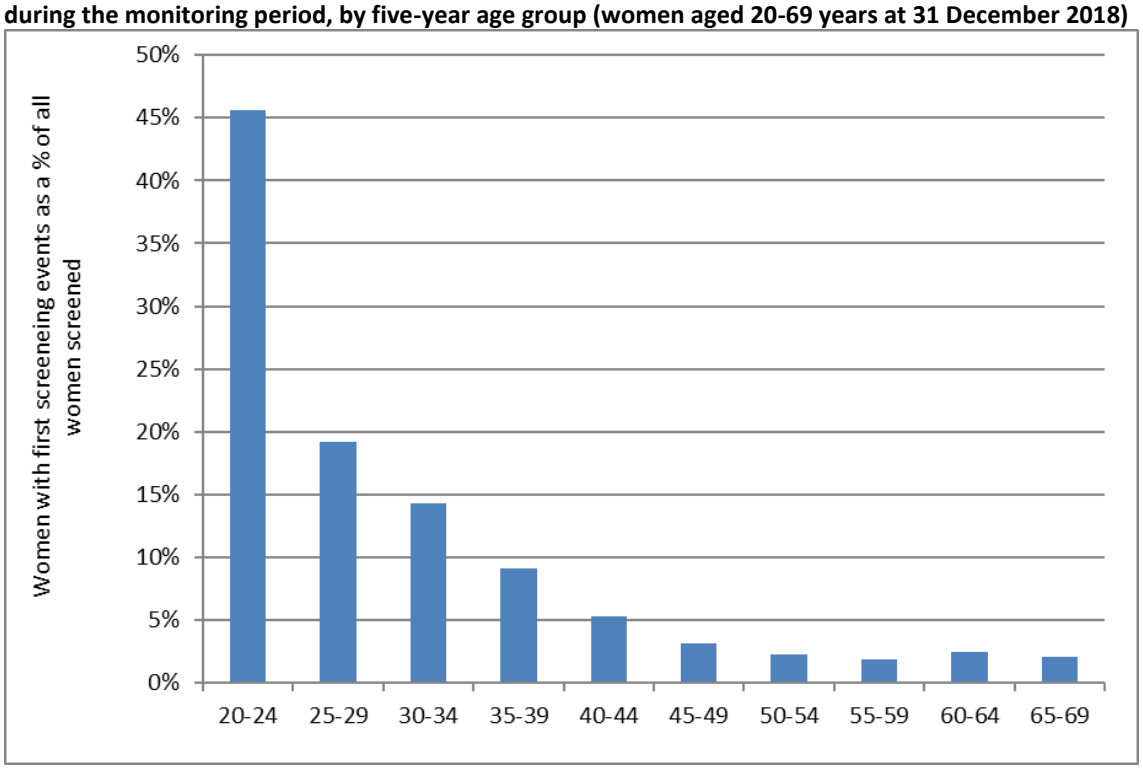


Figure 36 - Women with first screening events as a proportion of all women screened during the monitoring period, by DHB (women aged 20-69 years at 31 December 2018)

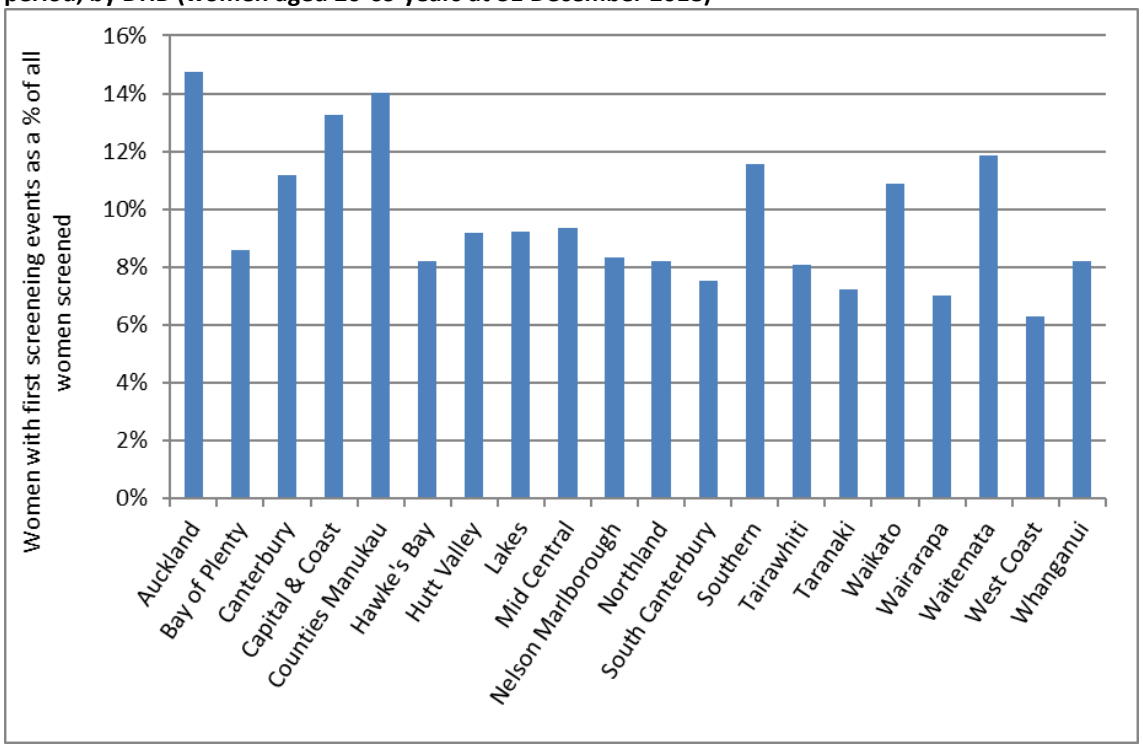


Figure 37 - Women with first screening events as a proportion of all women screened during the monitoring period, by ethnicity (women aged 20-69 years at 31 December 2019)

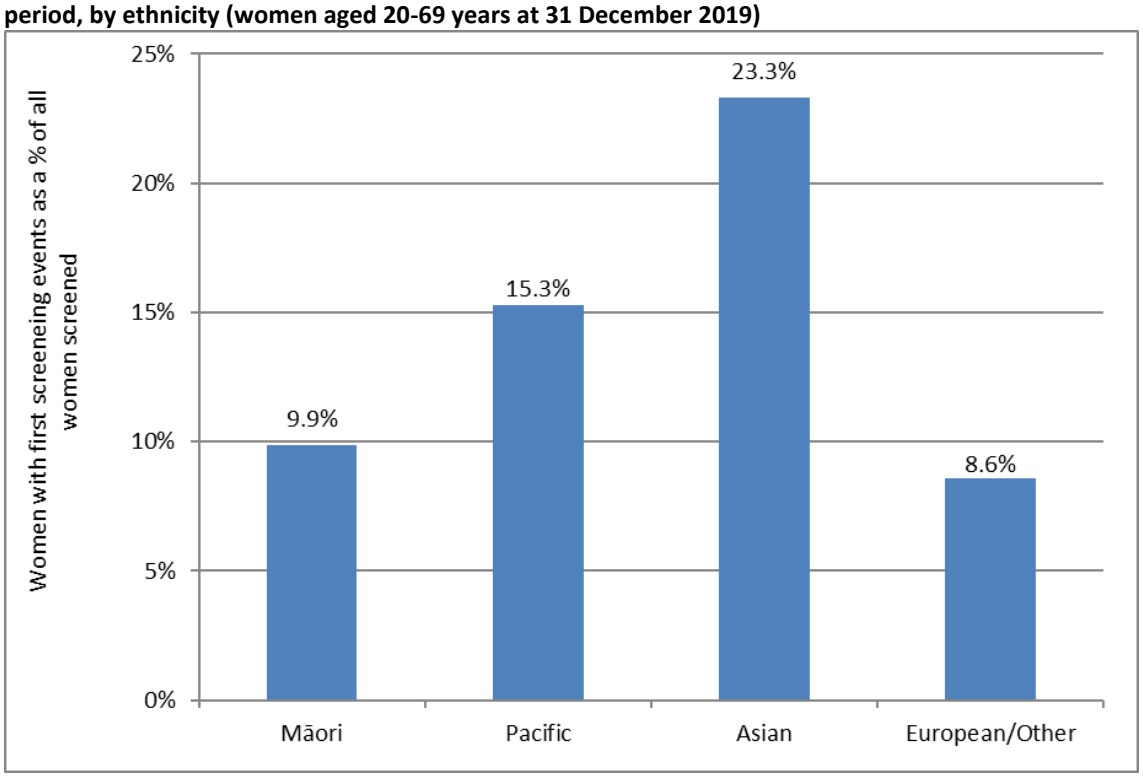


Figure 38 - Trends in the number of women with a first screening event, by age

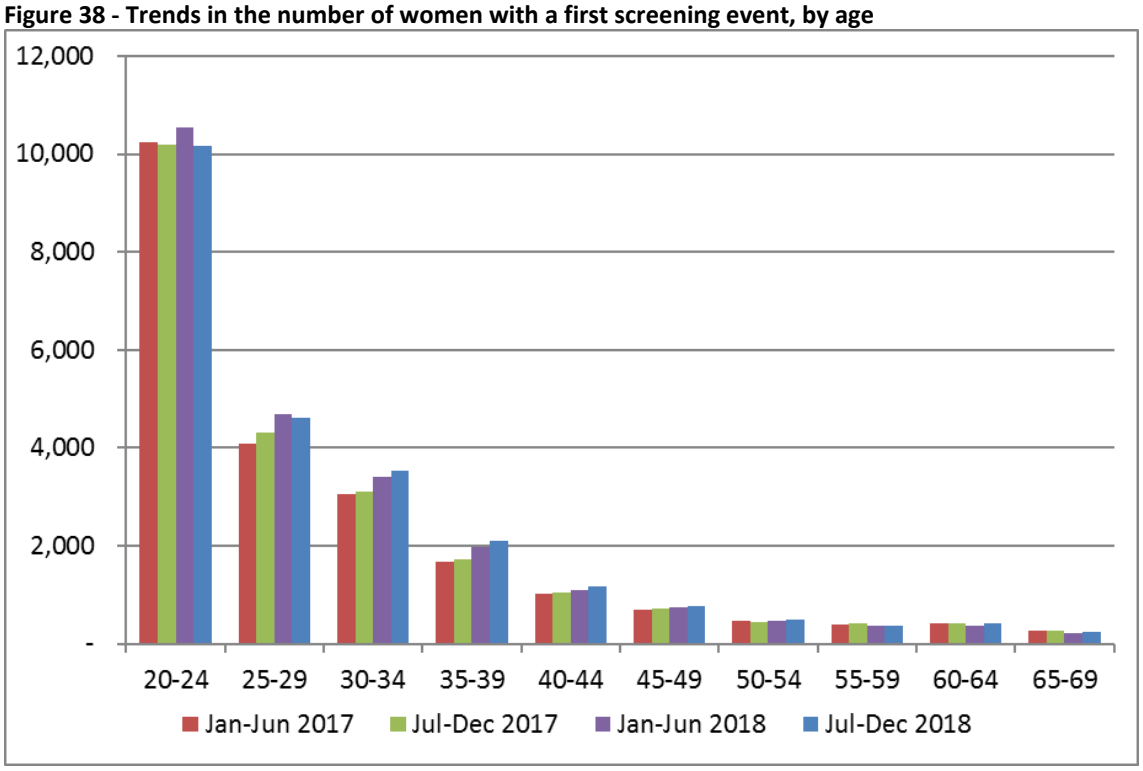


Figure 39 - Trends in the number of women with a first screening event, by DHB

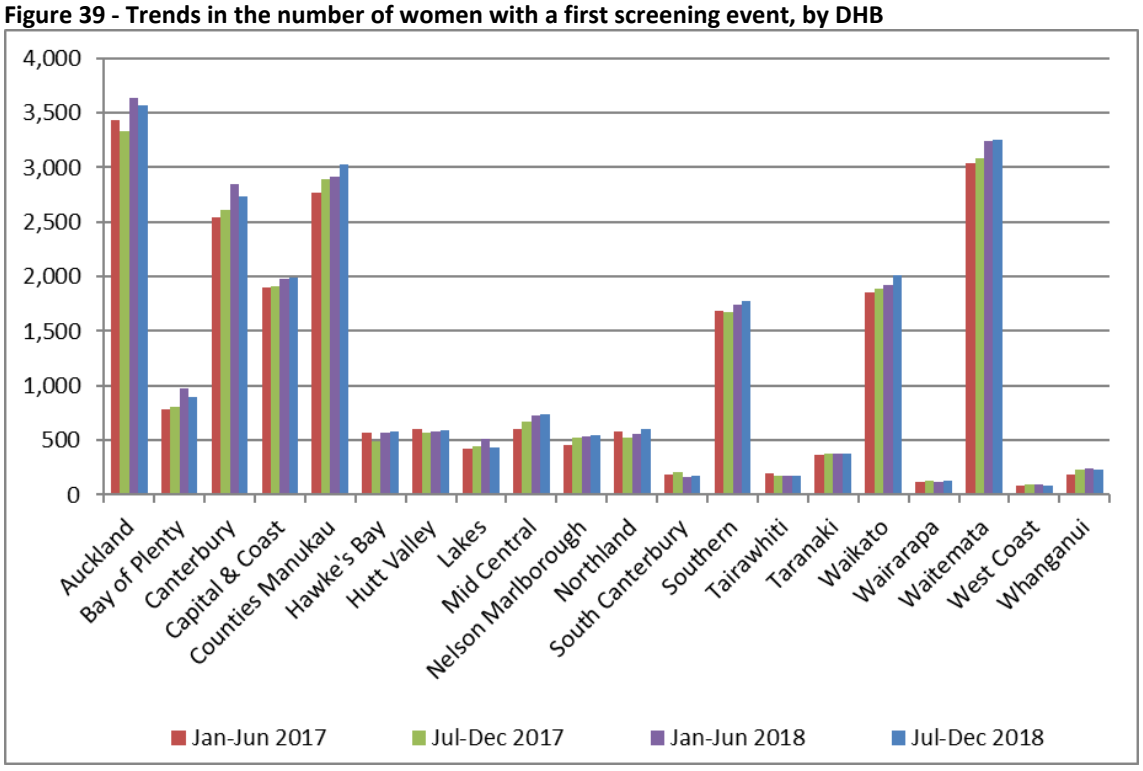
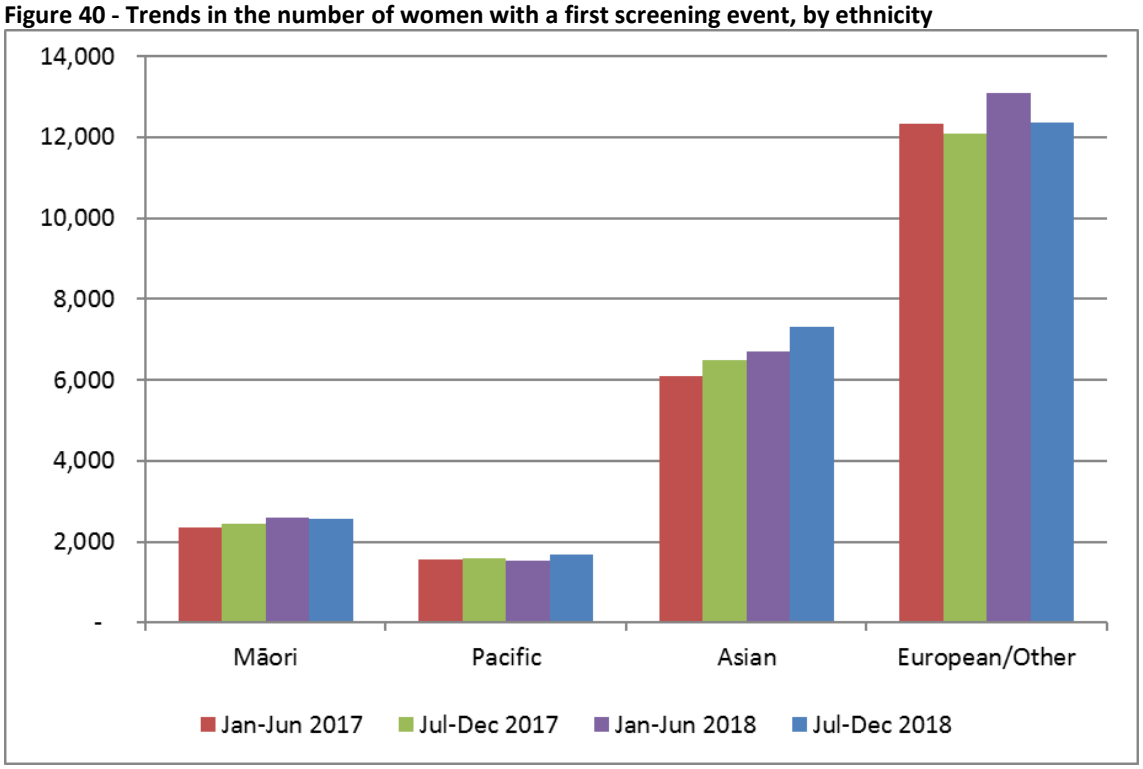


Figure 40 - Trends in the number of women with a first screening event, by ethnicity

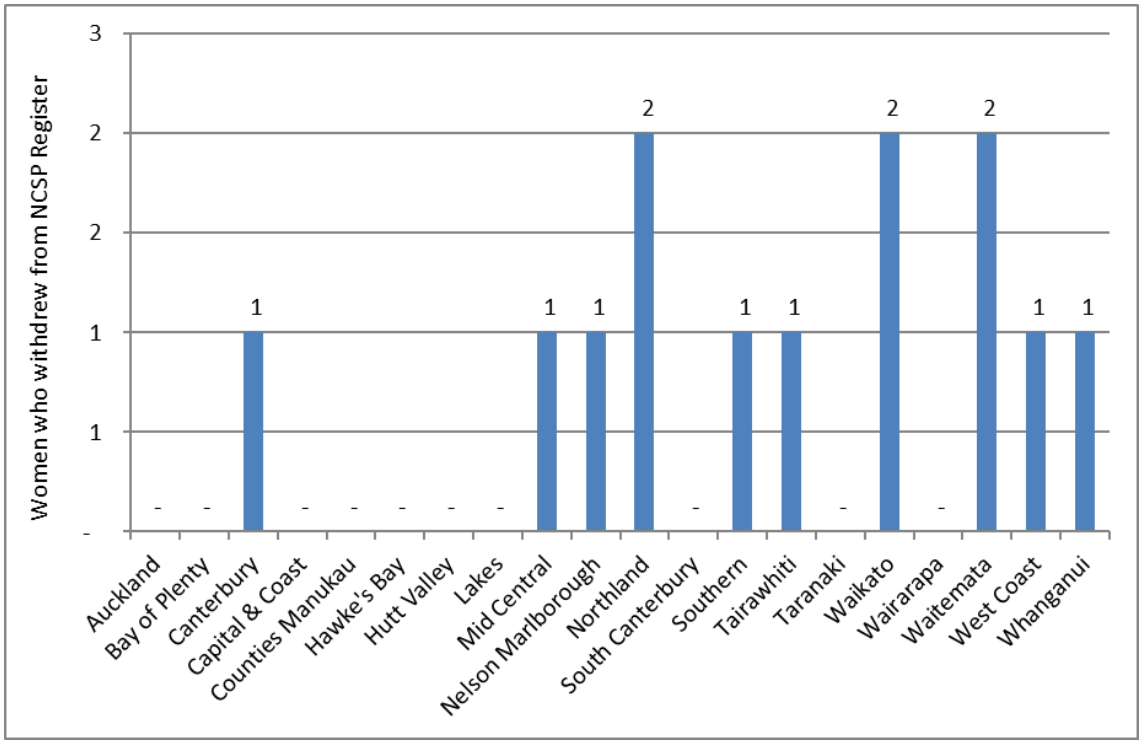


Indicator 3 – Withdrawal rates

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 2018 (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 31 December 2018).
Target	Zero for ages 20-69 years.
Current Situation	At the end of the previous monitoring period, 1,615,813 women aged 20-69 years were enrolled on the NCSP Register. During the current monitoring period, 15 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 two women in the Northland, Waikato and Waitemata). No women withdrew in ten of the twenty DHB regions (Figure 41). The number and proportion of women withdrawing was extremely small for all ethnic groups. No Pacific women withdrew in the current monitoring period), while 11 European/ Other women (0.001%), three Māori women (0.001%) and one Asian woman (<0.001%) withdrew during the current monitoring period (Figure 43, Table 51). The number and proportion of women withdrawing was extremely small for all age groups, but were largest among women aged 65-69 years (three women, 0.002% of those enrolled at the end of the previous monitoring period), 60-64 years (three withdrawals, 0.002%) and 55-59 years (two withdrawals, 0.001%; Figure 42, Table 52).
Trends	The number of women who withdrew in the current monitoring period (15 women) is lower than in the previous monitoring period (22 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 41 - Number of women (aged 20-69 years) who withdrew from the NCSP Register by DHB, 1 July – 31 December 2018



Excludes 2 women who withdrew whose DHB was not recorded.

Figure 42 - Number of women who withdrew from the NCSP Register by age, 1 July – 31 December 2018

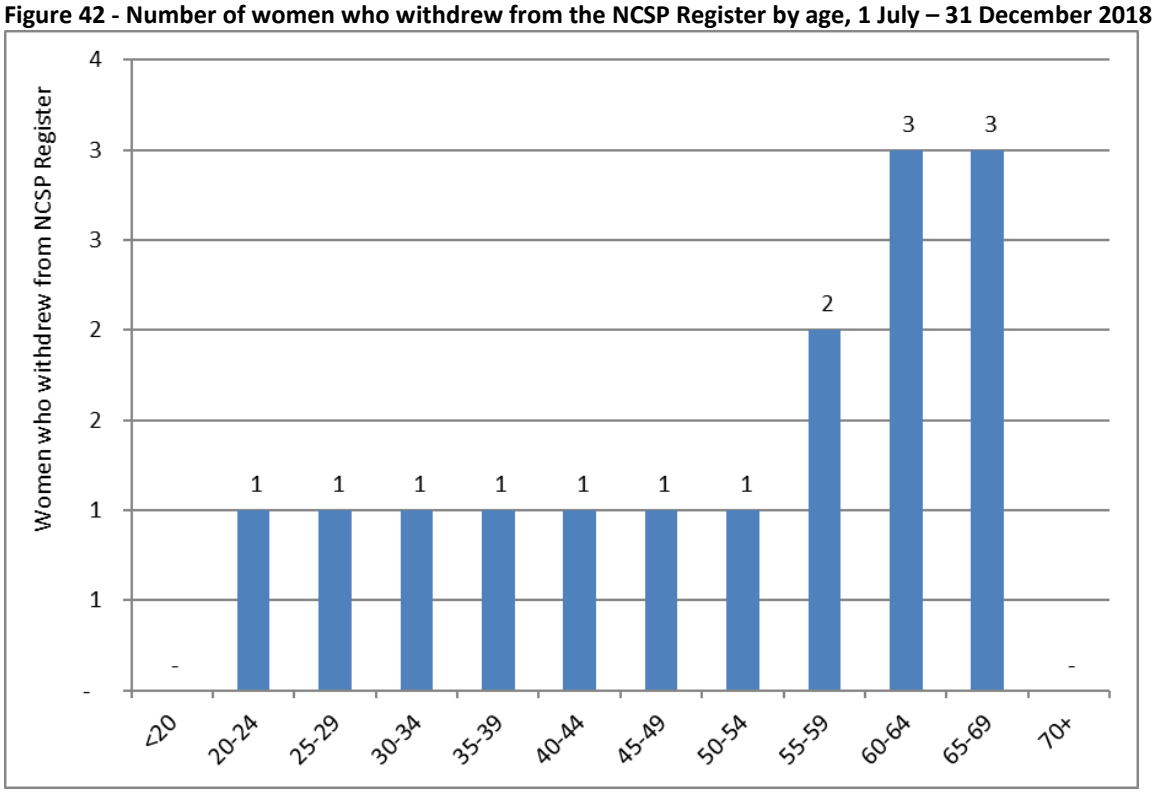
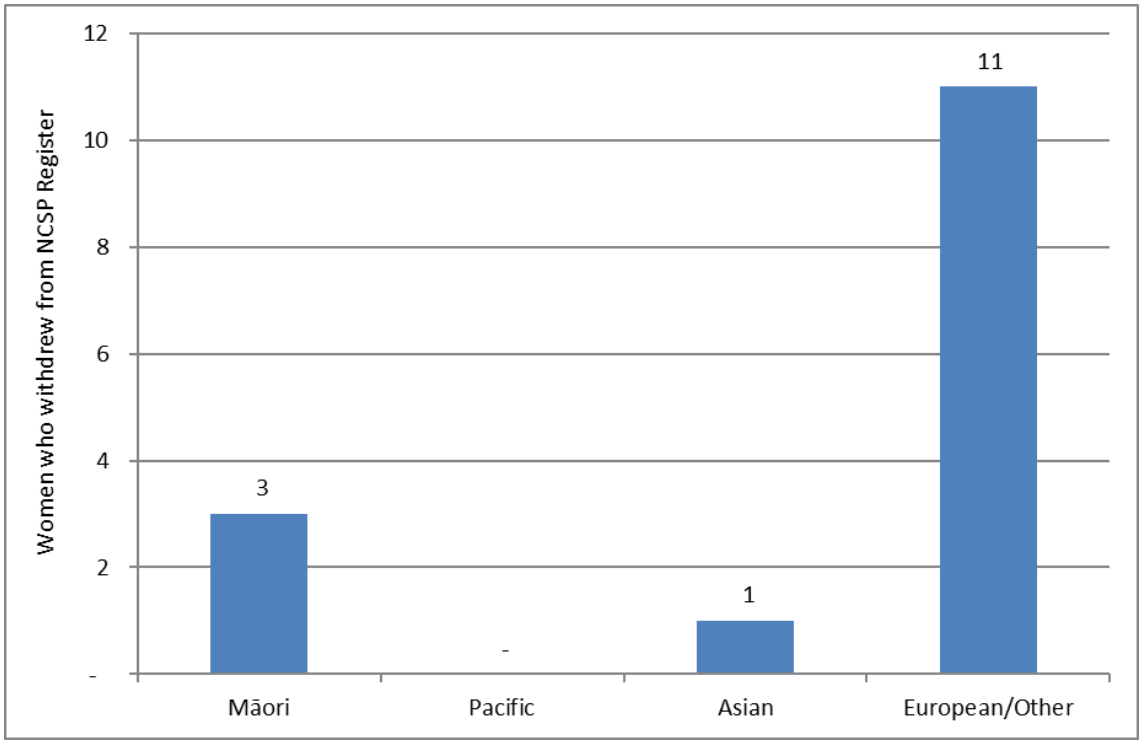


Figure 43 - Number of women (aged 20-69 years) who withdrew from the NCSP Register by ethnicity, 1 July – 31 December 2018



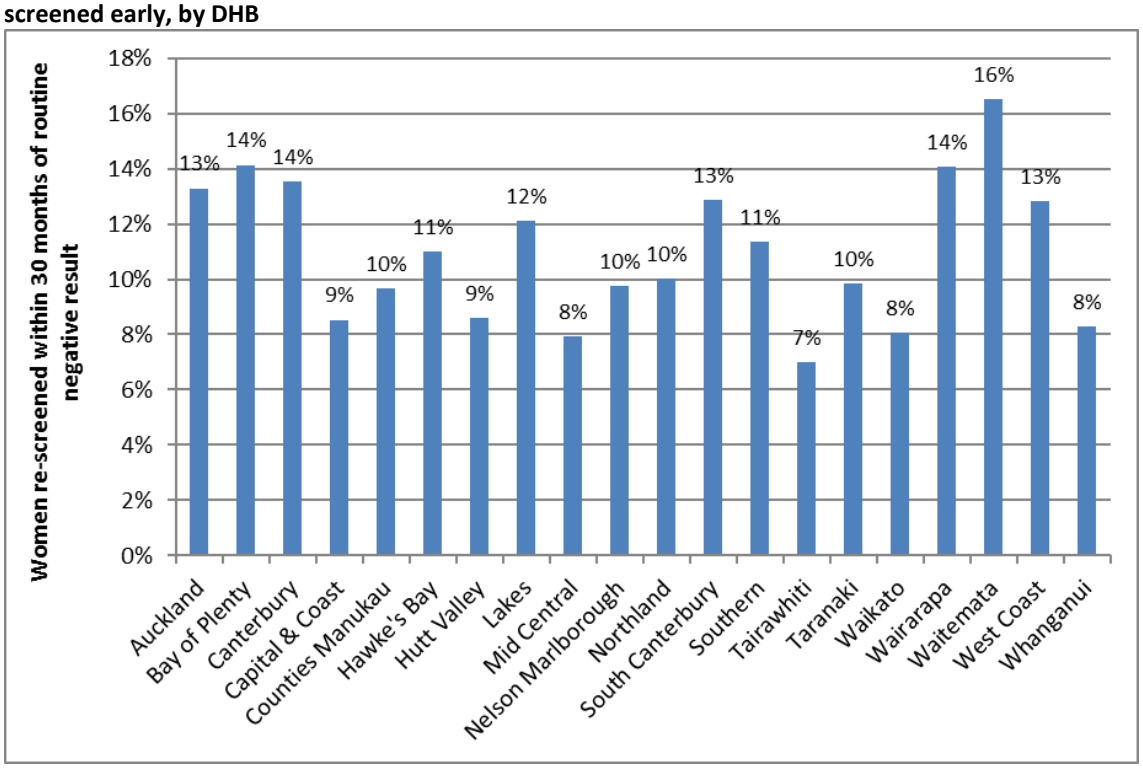
Indicator 4 – Early re-screening

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 February – 31 March 2016 (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 2016 (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 31 December 2018).
Target	A target has not been set for this cohort-based calculation method.
Current Situation	There were 47,255 women who had a smear taken in 1 February – 31 March 2016, 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, 5,493 (11.6%) 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 Waitemata (16.5%), and was least common in Tairawhiti (7.0%; Figure 44, Table 53). 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 (15.6%) and older women (aged 65-69 years) were the least likely to be re-screened early (7.6%; Figure 45, Table 54). Rates of early re-screening tended to decrease with increasing age but were quite similar across five-year age groups from 25 to 54 years (between 11.7% and 13.4%).

	Among the ethnic groups considered, European/ Other were the most likely to be re-screened early (12.2%), while early re-screening was least common among Pacific women (7.6%; Figure 46, Table 55).
Trends	The level of early re-screening (11.6%) is slightly lower to what was reported in the previous monitoring period (12.1%) and has been declining over a number of reporting periods. The DHB with the highest level of early rescreening in this report was Waitemata (16.5%) followed by Bay of Plenty and Wairarapa (14.1%). In eleven of the twenty DHBs, early rescreening decreased but increased in nine DHBs (Bay of Plenty, Hawke's Bay, Hutt Valley, Lakes, Northland, South Canterbury, Waitemata, West Coast and Whanganui) with the greatest increases occurring in West Coast (from 6.5% to 12.8% in the current report) followed by South Canterbury (from 6.7% to 8.3% in the current report). Trends over the two years ending 31 December 2018 by DHB are shown in Figure 47. A reduction in the level of early re-screening was seen for seven of the ten five-year age groups between 20 and 69 years since the previous report. A small increase was seen in two age groups however: in women aged 30-34 years (from 13.2% to 13.4%) and women aged 60-64 years (from 8.1% to 9.3%). Women 45-49 remained at a similar percent between the two monitoring periods (12.4%). Trends over the two years ending 31 December 2018 by five-year age group are shown in Figure 48. Small decreases in early re-screening were also seen in all four ethnic groups. The greatest drop was seen in Asian women (from 11.9% to 10.7%) since the last monitoring period. Decreases to a lesser extent were seen for Pacific, European/ Other and Māori women.
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.

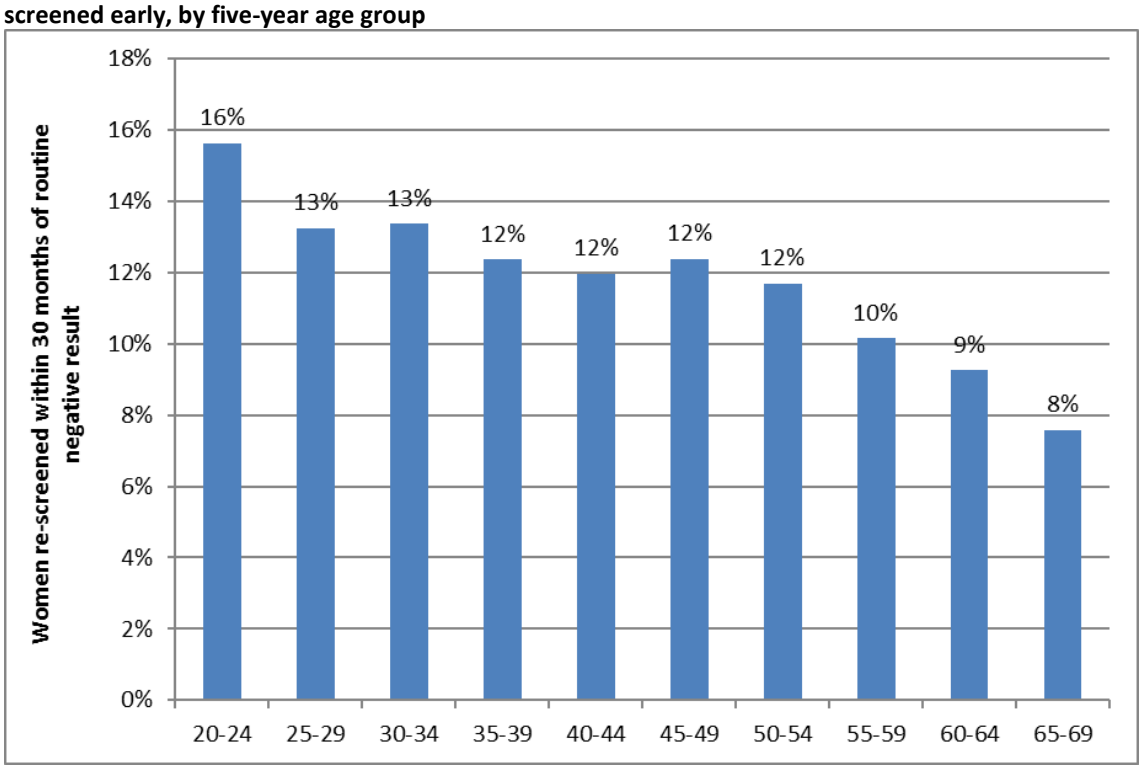
There are some similarities between Indicator 4 and Indicator 1.2, although they examine different groups of women and the proportions reported answer somewhat different questions (as is described in more detail in the *Definition* and Comments section of Indicator 1.2). Indicator 1.2 addresses the question – "*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 44 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB



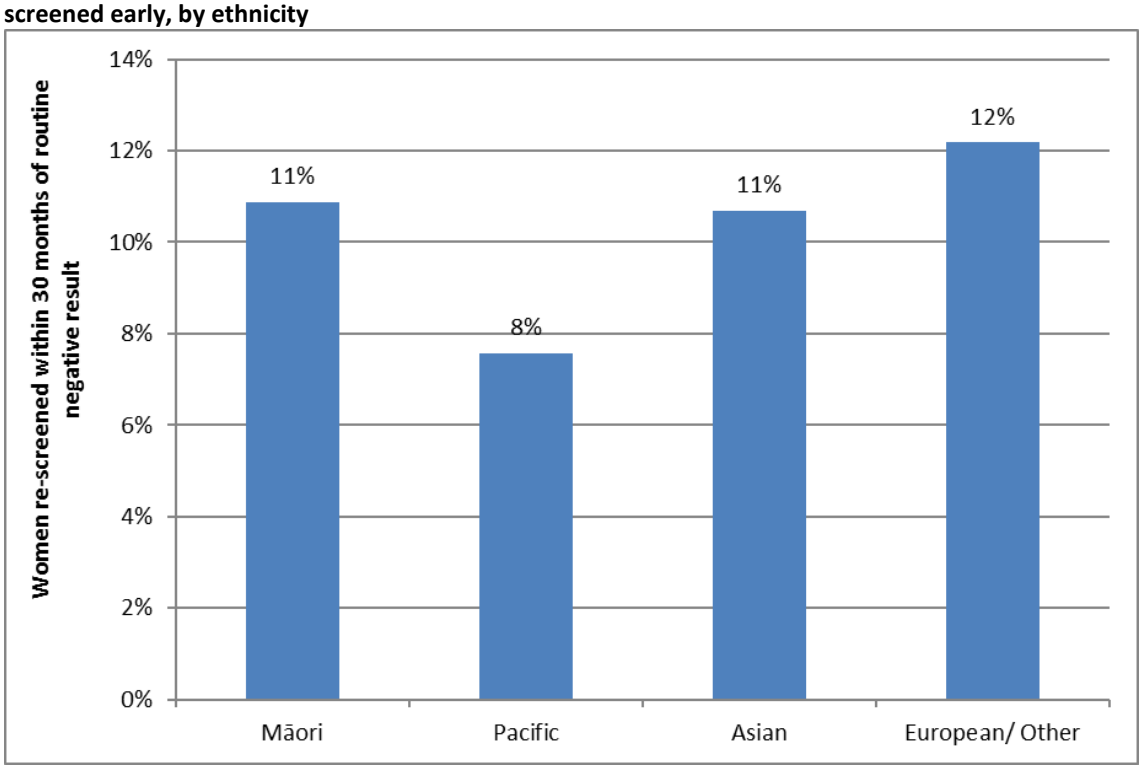
See also Table 53.

Figure 45 - 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 54.

Figure 46 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity



See also Table 55 .

Figure 47 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB

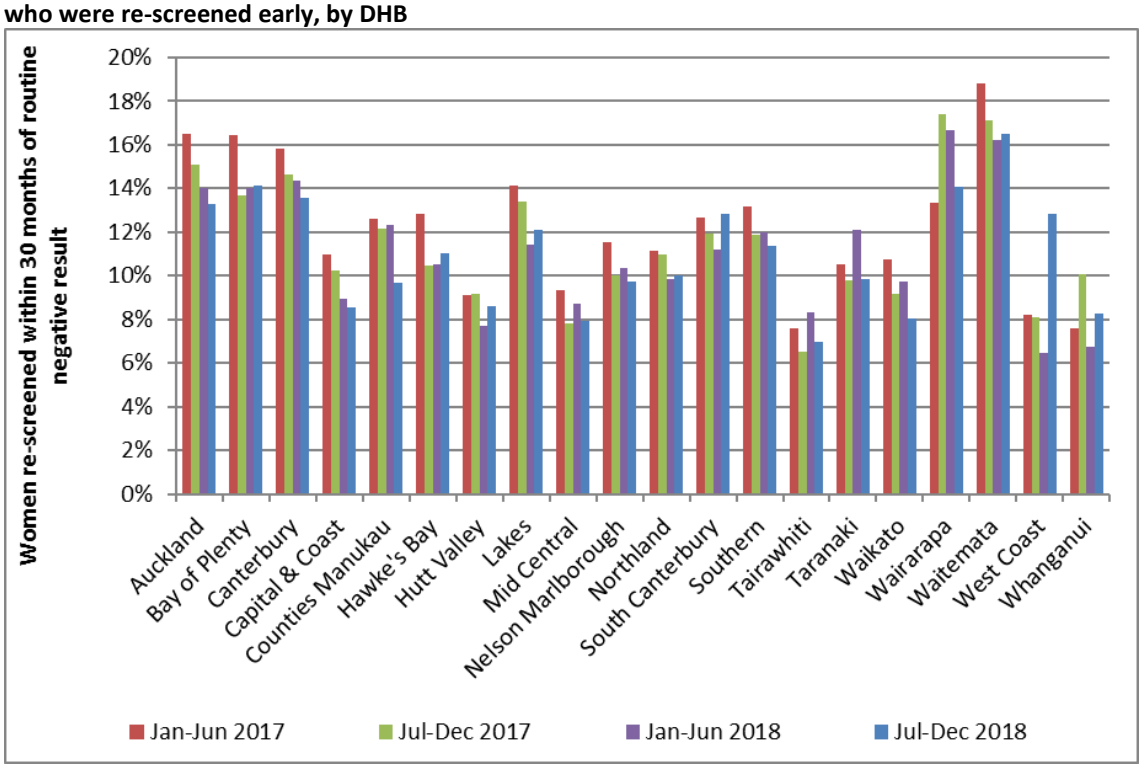


Figure 48 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by age

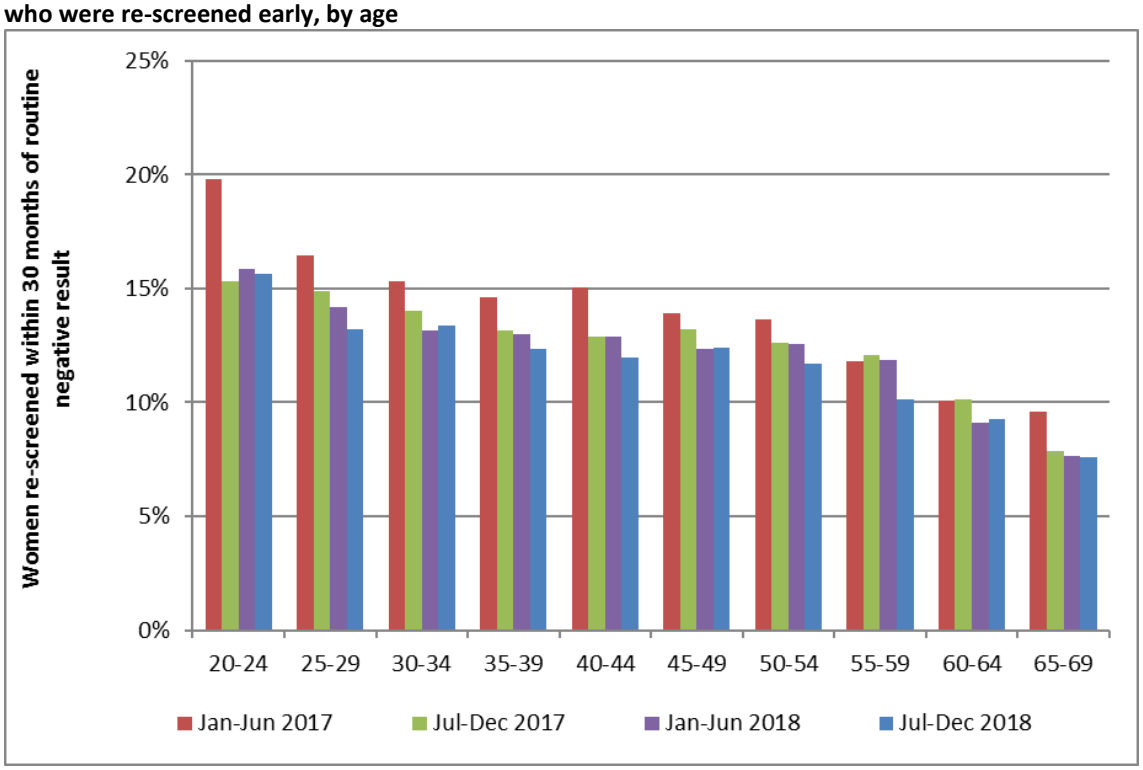
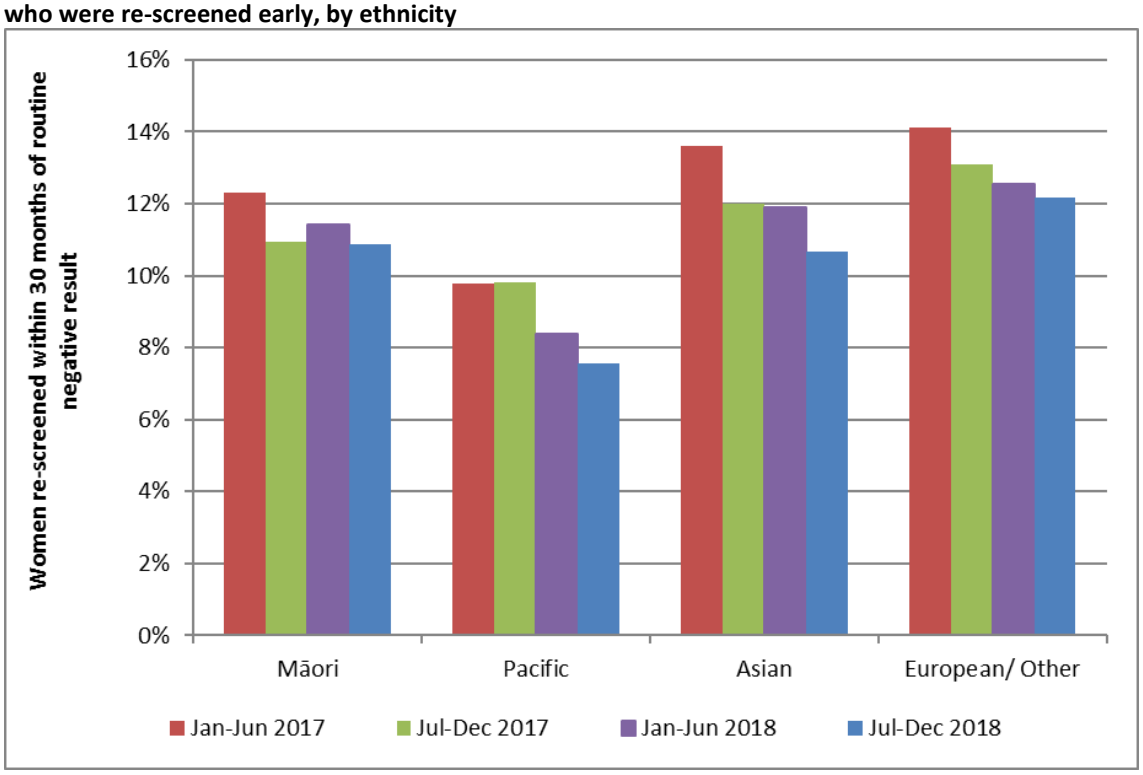


Figure 49 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity



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, including conventional, LBC, and combined samples. 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 213,822 cytology samples were taken, almost all of which (>99.99%) were coded as liquid-based cytology (LBC) samples. ***Unsatisfactory cytology*** 2,324 cytology samples (1.1%) were unsatisfactory. The unsatisfactory rate for LBC is 1.1%, which 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%

(Medlab Central Ltd; 3.1%). Pathlab had the lowest unsatisfactory percentage of 0.4% (Figure 50, Table 1). Unsatisfactory samples are reported in more detail in Table 1 and Figure 50. The remaining satisfactory samples are reported on below and in more detail in Table 2 to Table 6.

Negative cytology reports

93.3% of satisfactory cytology results were negative (Table 2), consistent with the target of no more than 96%. The proportion of samples which were negative varied by laboratory from 76.5% (LabPLUS) to 95.5% (Southern Community Labs; Figure 51, Table 2). 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%) was consistent with the target of no more than 10% (Figure 52, Table 2). This varied by laboratory, from 4.5% (Southern Community Labs) to 23.5% (LabPLUS; Figure 52). Two laboratories (LabPLUS and Medlab Central Ltd) exceeded the target (23.5% and 10.2%, 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 0.4% (Pathlab) to 2.3% (LabPLUS). Five of the six laboratories met the HSIL target (Table 4, Figure 53). 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 56). Therefore a difference in the age-mix of the women that different laboratories reported cytology for did not alter whether or not laboratories met the 0.5% target, or shift the percentage of satisfactory cytology reported as HSIL closer to the target in the laboratory where rates were less than 0.5%.

Trends

Unsatisfactory cytology

Overall, the percentage of unsatisfactory LBC samples for the current monitoring period (1.1% is slightly lower than that seen in the previous monitoring period (1.3%).

Negative vs abnormal cytology reports

The proportion of satisfactory cytology samples which are negative for intraepithelial lesion or malignancy (93.3%) is the same as the previous monitoring period, and correspondingly the proportion of cytology samples reported as abnormal (6.7%) is also the same as in the previous monitoring

period. All six laboratories continued to meet the target for negative cytology. One laboratory changed for abnormal cytology rates above the target of 10% (Canterbury Health Laboratories and LabPLUS were above the target in the previous monitoring report whilst Medlab Central Ltd and LabPLUS were above the target this current reporting period).

HSIL cytology reports

The proportion of satisfactory cytology samples reported as HSIL (0.8%) is similar to that reported in the previous monitoring report (0.8%). Five of the six laboratories met the target, one less than in the previous report.

Longer term trends in the proportion of satisfactory cytology samples reported as HSIL are shown in Figure 54, Figure 55 (trends by age) and Figure 56 (trends by laboratory). Figure 54 and Figure 56 show trends over the last four monitoring report periods (two years), consistent with other trends presented in this report. Figure 55 shows longer term trends (1 July 2009 to 31 Dec 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. However, 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). There has been a plateau or small decline in HSIL rates observed over the last four monitoring reports up to December 2018, with rates being below or very similar to 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 40-44 (increase from 0.6% to 0.7%) and 50-54 (an increase from 0.2% to 0.3%).

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.

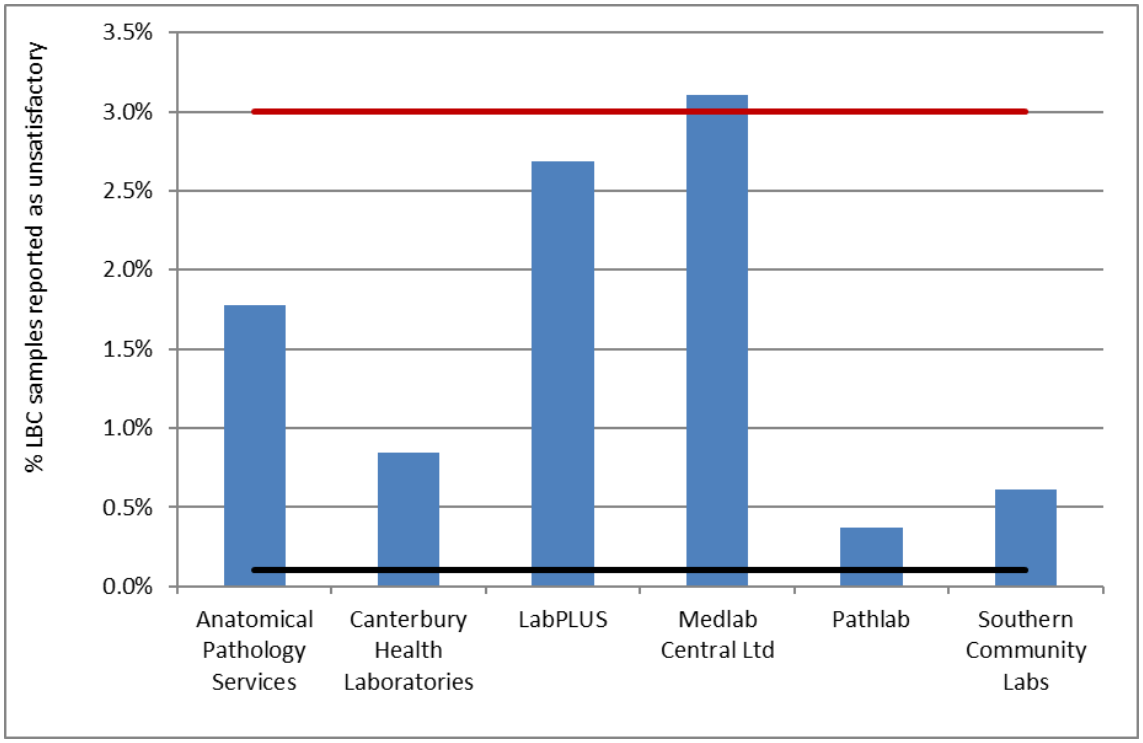
Workload catchments for laboratories may be regional or nationwide and may change because of laboratory service restructuring. As a result, it is not always straightforward to determine the catchment population for a laboratory. Rates of negative and abnormal results for individual laboratories therefore 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),[6-9] and that this is particularly true for younger women.[6,10-12] 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 is 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.

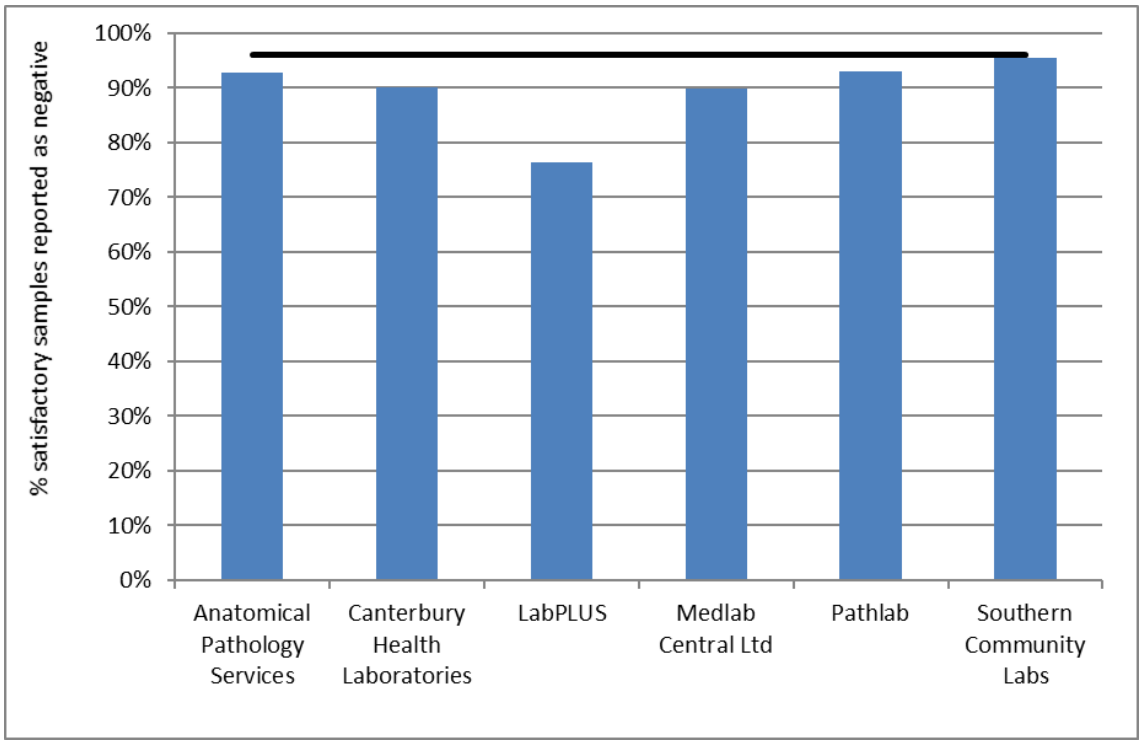
In the current report we additionally examined age-standardised rates of HSIL cytology reports, in order to partially account for differences in the age of the population whose cytology tests each laboratory processes. This could be an additional factor in some laboratories having higher or lower HSIL 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 50 - Proportion of total LBC samples reported as unsatisfactory by laboratory, 1 July – 31 December 2018



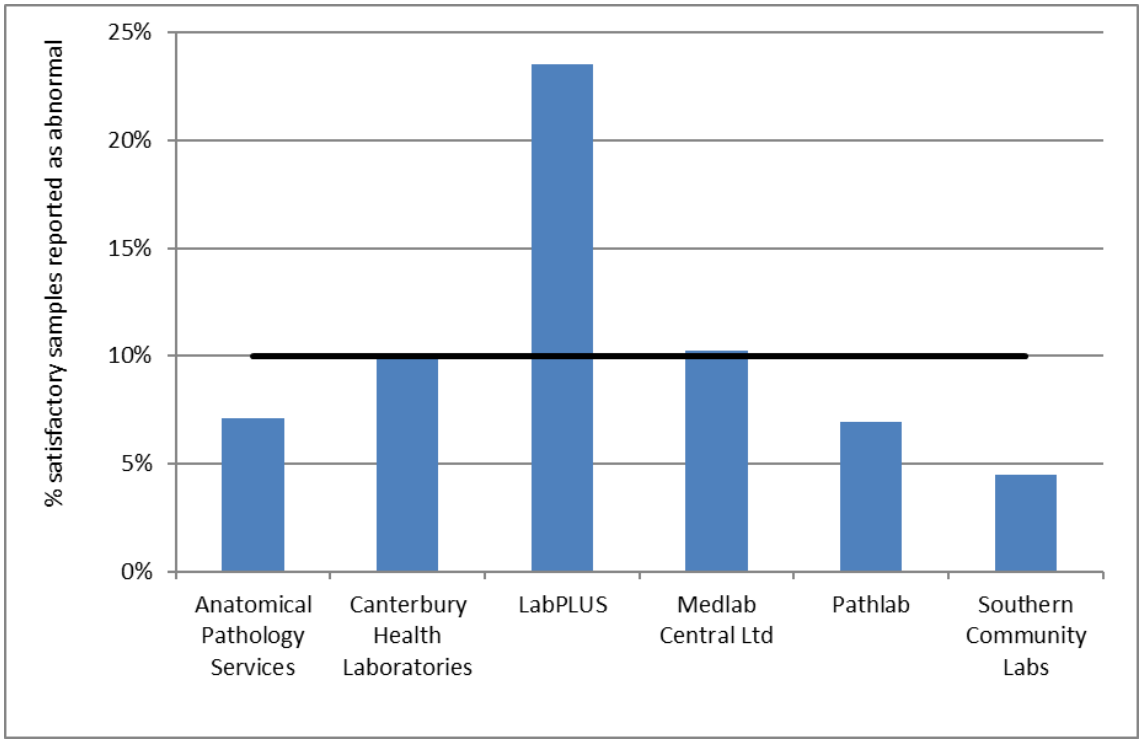
Target for LBC: 0.1-3.0% (Red line-upper target limit; black line=lower target limit).

Figure 51 - Proportion of total satisfactory samples reported as negative by laboratory, 1 July – 31 December 2018



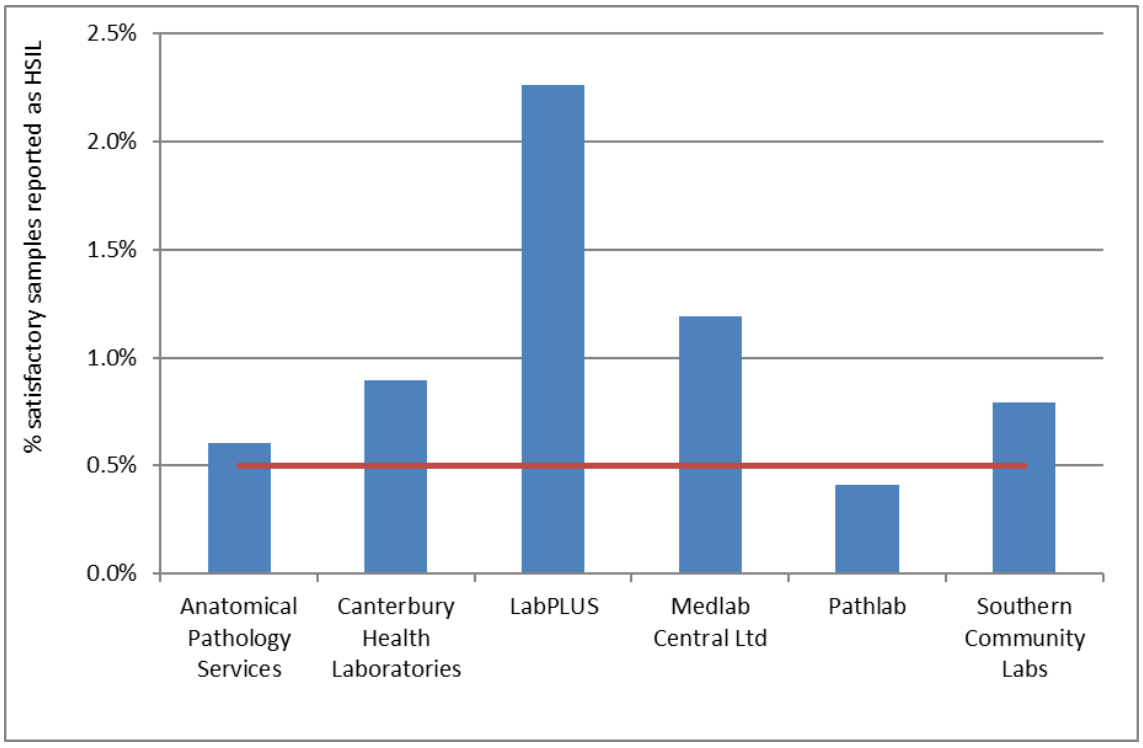
Note: Line shows negative target of no more than 96%.

Figure 52 - Proportion of total satisfactory samples reported as abnormalities by laboratory, 1 July – 31 December 2018



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

Figure 53 - Proportion of total satisfactory samples reported as HSIL by laboratory, 1 July – 31 December 2018



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

Table 1 - Satisfactory and unsatisfactory cytology reporting by laboratory (1 July – 31 December 2018)

Laboratory	All samples	Satisfactory		Unsatisfactory	
	N	N	%	N	%
Anatomical Pathology Services	43,855	43,074	98.2	781	1.8
Canterbury Health Laboratories	9,930	9,846	99.2	84	0.8
LabPLUS	7,777	7,568	97.3	209	2.7
Medlab Central Ltd	15,452	14,972	96.9	480	3.1
Pathlab	27,263	27,162	99.6	101	0.4
Southern Community Labs	109,545	108,876	99.4	669	0.6
Total	**213,822**	**211,498**	**98.9**	**2,324**	**1.1**

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

Table 2 - Laboratory cytology reporting by general result (1 July – 31 December 2018) – percentage of satisfactory samples

Laboratory	Negative		Abnormal	
	N	%	N	%
Anatomical Pathology Services	40,005	92.9	3,069	7.1
Canterbury Health Laboratories	8,876	90.1	970	9.9
LabPLUS	5,789	76.5	1,779	23.5
Medlab Central Ltd	13,442	89.8	1,530	10.2
Pathlab	25,283	93.1	1,879	6.9
Southern Community Labs	103,987	95.5	4,889	4.5
Total	**197,382**	**93.3**	**14,116**	**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 July – 31 December 2018) – counts of all satisfactory samples

Laboratory	Result									
	Negative	ASC-US	LSIL	ASC-H	HSIL	SC	AGC/AIS	Adeno-carcinoma	Malignant Neoplasm	Total
Anatomical Pathology Services	40,005	980	1,567	180	261	5	67	7	2	43,074
Canterbury Health Laboratories	8,876	338	403	123	88	3	11	3	1	9,846
LabPLUS	5,789	586	723	266	171	1	27	4	1	7,568
Medlab Central Ltd	13,442	627	581	123	178	2	15	4	-	14,972
Pathlab	25,283	645	971	122	111	4	25	1	-	27,162
Southern Community Labs	103,987	847	2,821	228	861	5	113	14	-	108,876
Total	**197,382**	**4,023**	**7,066**	**1,042**	**1,670**	**20**	**258**	**33**	**4**	**211,498**

Table 4 - Laboratory cytology reporting by cytological category (1 July – 31 December 2018) – percentage of all satisfactory samples

Laboratory	Result								
	Negative	ASC-US	LSIL	ASC-H	HSIL	SC	AGC/AIS	Adeno-carcinoma	Malignant Neoplasm
Anatomical Pathology Services	92.9	2.3	3.6	0.4	0.6	0.01	0.16	0.02	<0.005
Canterbury Health Laboratories	90.1	3.4	4.1	1.2	0.9	0.03	0.11	0.03	0.01
LabPLUS	76.5	7.7	9.6	3.5	2.3	0.01	0.36	0.05	0.01
Medlab Central Ltd	89.8	4.2	3.9	0.8	1.2	0.01	0.10	0.03	-
Pathlab	93.1	2.4	3.6	0.4	0.4	0.01	0.09	<0.005	-
Southern Community Labs	95.5	0.8	2.6	0.2	0.8	<0.005	0.10	0.01	-
Total	**93.3**	**1.9**	**3.3**	**0.5**	**0.8**	**0.01**	**0.12**	**0.02**	**<0.005**

Target: HSIL ≥ 0.5% reported as HSIL.

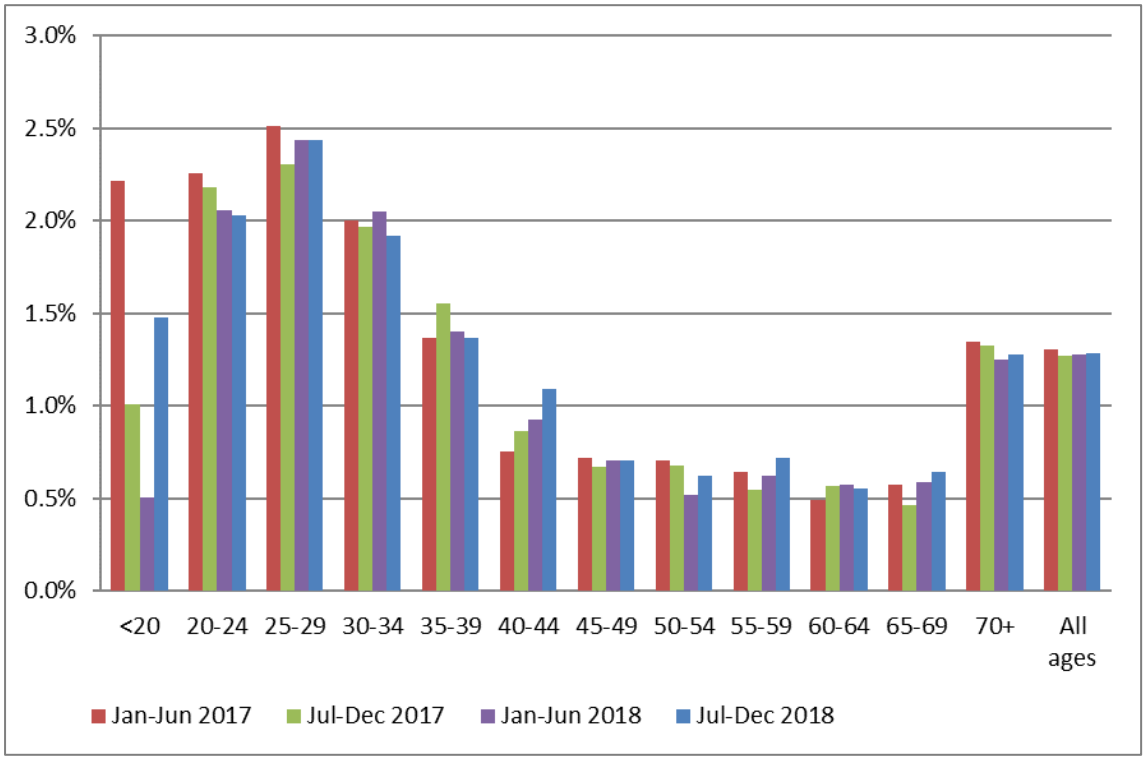
Table 5 - Laboratory reporting of cytological category by five-year age group (1 July – 31 December 2018) – counts of all satisfactory samples

Age Group	Cytology Result									Total
	Negative	ASC-US	LSIL	ASC-H	HSIL	SC	AGC/AIS	Adeno-carcinoma	Malignant Neoplasm	
<20	572	27	68	6	4	-	-	-	-	677
20-24	19,758	732	2,277	193	279	-	3	-	-	23,242
25-29	21,464	582	1,219	200	382	-	18	-	-	23,865
30-34	22,542	446	755	151	314	1	40	1	-	24,250
35-39	21,237	413	594	112	197	1	16	2	1	22,573
40-44	20,519	401	471	79	157	2	21	2	-	21,652
45-49	22,389	391	497	62	104	2	28	2	-	23,475
50-54	20,590	358	361	59	75	3	41	3	2	21,492
55-59	19,293	295	351	79	66	3	33	6	1	20,127
60-64	15,601	199	237	51	39	1	33	3	-	16,164
65-69	11,483	137	155	35	41	2	12	4	-	11,869
70+	1,934	42	81	15	12	5	13	10	-	2,112
Total	**197,382**	**4,023**	**7,066**	**1,042**	**1,670**	**20**	**258**	**33**	**4**	**211,498**

Table 6 - Laboratory reporting of cytological category by five-year age group (1 July – 31 December 2018) – percentage of all satisfactory samples in women of that age group

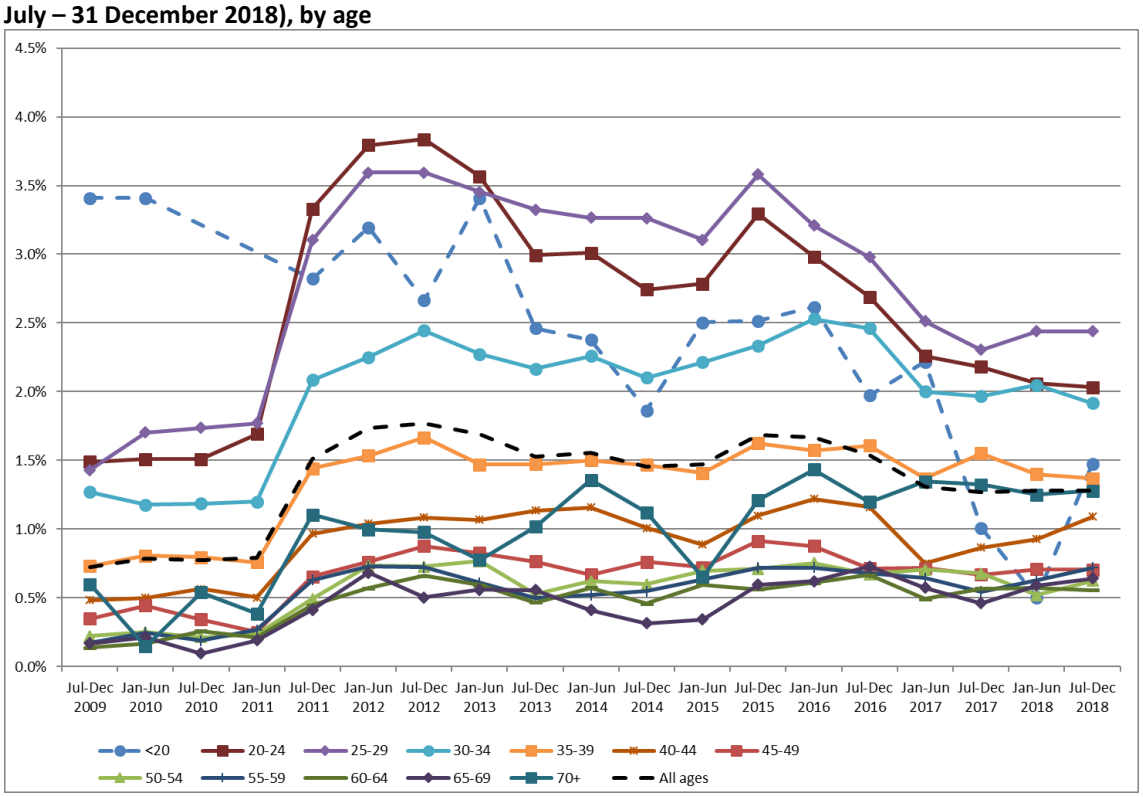
Age Group	Cytology Result								
	Negative	ASC-US	LSIL	ASC-H	HSIL	SC	AGC/AIS	Adeno-carcinoma	Malignant Neoplasm
<20	84.5	4.0	10.0	0.9	0.6	-	-	-	-
20-24	85.0	3.1	9.8	0.8	1.2	-	0.01	-	-
25-29	89.9	2.4	5.1	0.8	1.6	-	0.08	-	-
30-34	93.0	1.8	3.1	0.6	1.3	<0.005	0.16	<0.005	-
35-39	94.1	1.8	2.6	0.5	0.9	<0.005	0.07	0.01	<0.005
40-44	94.8	1.9	2.2	0.4	0.7	0.01	0.10	0.01	-
45-49	95.4	1.7	2.1	0.3	0.4	0.01	0.12	0.01	-
50-54	95.8	1.7	1.7	0.3	0.3	0.01	0.19	0.01	0.01
55-59	95.9	1.5	1.7	0.4	0.3	0.01	0.16	0.03	<0.005
60-64	96.5	1.2	1.5	0.3	0.2	0.01	0.20	0.02	-
65-69	96.7	1.2	1.3	0.3	0.3	0.02	0.10	0.03	-
70+	91.6	2.0	3.8	0.7	0.6	0.24	0.62	0.47	-
Total	**93.3**	**1.9**	**3.3**	**0.5**	**0.8**	**0.01**	**0.12**	**0.02**	**<0.005**

Figure 54 - Trends in the proportion of total satisfactory samples reported as HSIL (last four monitoring periods), by age



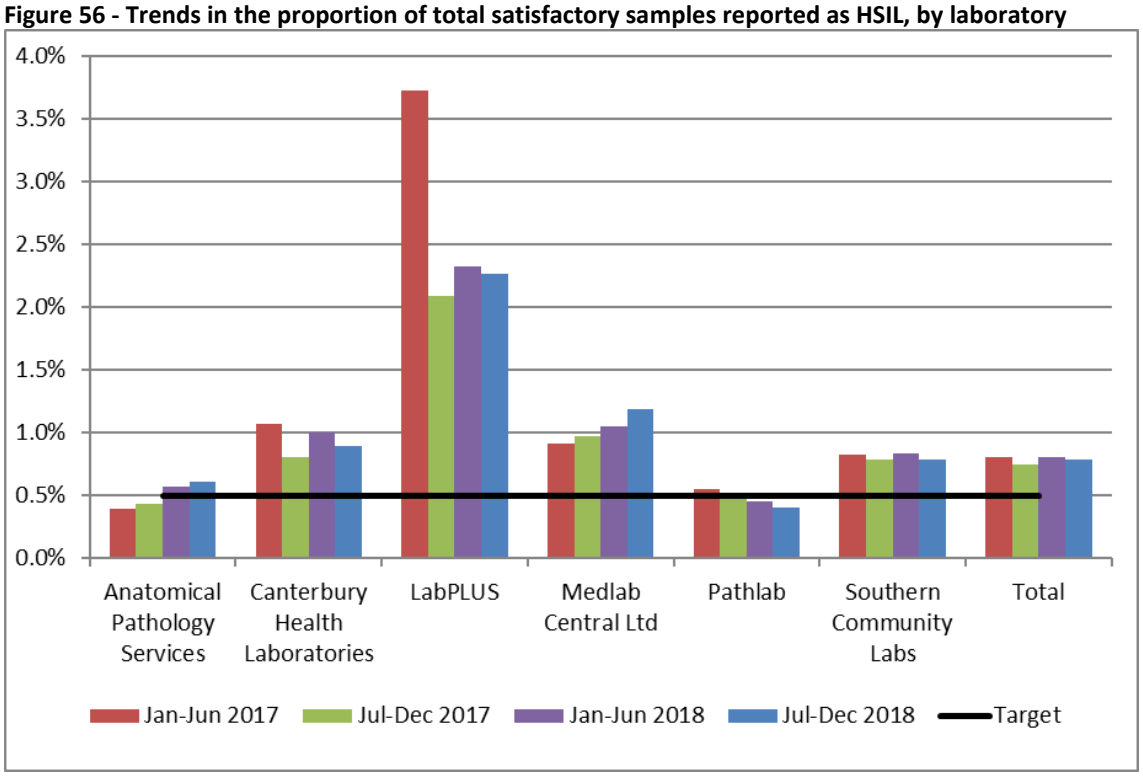
Note: women aged less than 20 years are not routinely screened.

Figure 55 - Longer term trends in the proportion of total satisfactory samples reported as ASC-H or HSIL (to 1 July – 31 December 2018), by age



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

Figure 56 - 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 January – 30 June 2018 inclusive) were identified. In the previous and current reports, 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 prior reports, this restriction had not been applied ("original method"). Where a woman had multiple samples, or a 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. From the previous 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, 1,119 women with HSIL or SC cytology reports were identified. 89 of these women (8.0%) had no histology taken in the six months after the cytology sample was taken. Among the remaining 1,030 for whom there was histology, 820 (79.6%) had their HSIL or SC cytology report confirmed as high -grade by histology (Figure 57, Table 57). By laboratory, the proportion of HSIL + SC being confirmed as high -grade by histology ranged from 68.2% for LabPLUS to 86.5% 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; Figure 57, Table 57). ***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

606 women with a cytology report of ASC-H were identified. 96 (15.8%) had no histology taken in the six months after the cytology sample. Among the remaining 510 women, 266 (52.2%) were histologically confirmed as high -grade. This proportion varied by laboratory, from 40.0% (LabPLUS) to 60.8% (Medlab Central Ltd; Figure 58, Table 58).

ASC-H + HSIL + SC

A total of 1,725 women had a cytology report of ASC-H, HSIL or SC. 185 (10.7%) had no histology taken in the six months after the cytology sample. Among the remaining 1,540 women, 1,086 (70.5%) were histologically confirmed as high -grade. This proportion varied by laboratory, from 50.0% (LabPLUS) to 75.8% (Medlab Central Ltd; Figure 58, Table 59).

Glandular abnormalities

There were 213 women with a glandular abnormality (AG1-AG5, AIS, AC1-AC4) identified. 71 women (33.3%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 142 women, 63 (44.4%) 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.

Trends

As the method for defining the dataset changed in the previous monitoring period the trend analysis will be between the results of the last two monitoring reports only.

HSIL + SC

Positive predictive value for HSIL and SC cytology is lower when compared to the previous monitoring report (80.2% in the previous period; 79.6% 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% remained as one, Medlab Central only. The proportion of cytology reports with histology available following HSIL or SC results is lower (92.0% in the current report; 93.3% in the previous report). Trends in the positive predictive value for HSIL and SC cytology by laboratory are shown in Figure 59. Increases in the positive predictive value for HSIL and SC cytology were evident for Medlab Central Ltd, Pathlab and Southern Community Labs Dunedin but decreases were observed at Diagnostic Medlab Ltd, Canterbury Health Laboratories and LabPLUS.

ASC-H

Positive predictive value for ASC-H cytology is lower, from 55.4% to 52.2%, however there is no target for this measure. The proportion of ASC-H cytology reports with histology available is higher in the current report compare to the previous monitoring report (84.2% in current report; 83.4% in previous report; Figure 60). Increases in the positive predictive value for ASC-H cytology were evident in two laboratories of the six.

ASC-H + HSIL + SC

The positive predictive value for the combined group ASC-H, HSIL and SC has remained similar in the current report (70.5%). 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 61. Decreases in the positive predictive value for the combined group of ASC-H, HSIL and SC cytology were evident for two of six laboratories.

Glandular abnormalities

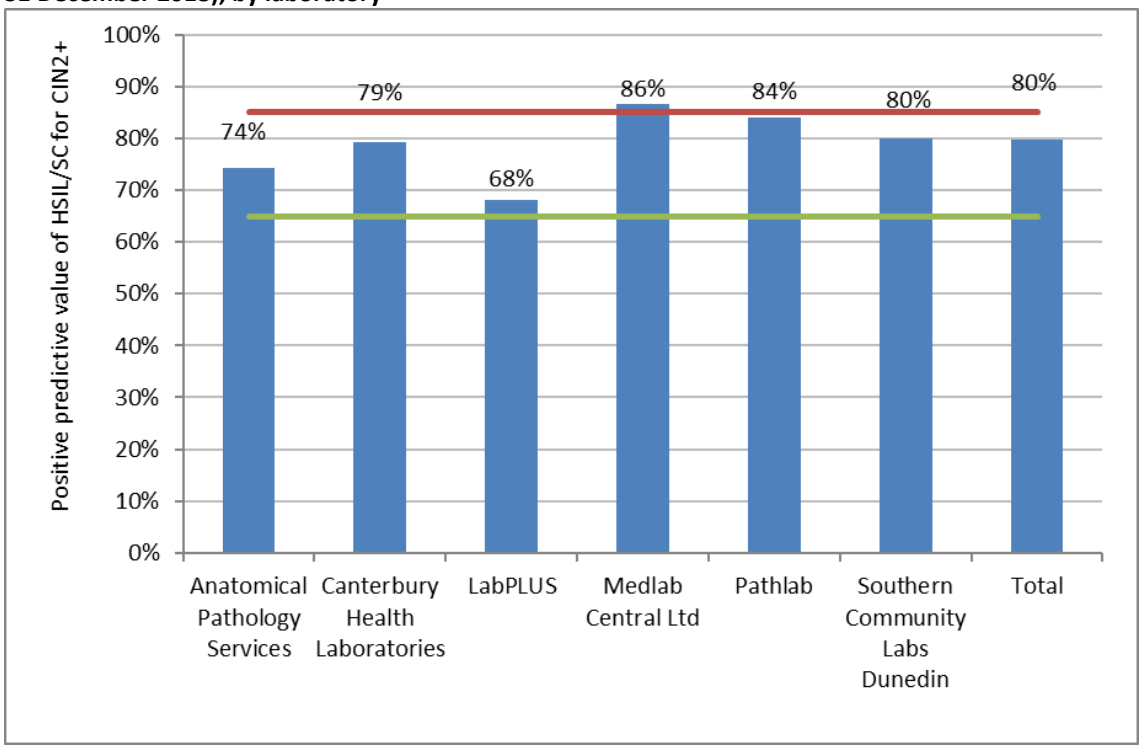
The positive predictive value of glandular abnormalities decreased (from 50.0% in the previous report to 44.4% in the current report). Compared to both ASC-H cytology, and the combined group of HSIL and SC cytology, there are far fewer glandular abnormalities, and an even smaller number with histology available. The proportion of glandular abnormalities with histology available (66.7%) is lower in this report than the previous monitoring period (70.5%), and remains less than ASC-H (84.2%) and HSIL + SC (92.0%). 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. 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 103 and compared with those for women with low-grade cytology results with a positive HPV triage test.

The calculations also do 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. Analysis restricted to screening or community-derived cytology samples would provide a clearer picture of positive predictive value (and other reporting categories) in a screening setting, however this is not possible within the current data set, as the NCSP Register does not record whether samples are screening versus diagnostic.

Figure 57 - Positive predictive value for CIN 2+ in women with HSIL or SC cytology reports (cytology in 1 July – 31 December 2018), by laboratory



Target: 65% - 85%.

Figure 58 - Positive predictive value for CIN 2+ in women with other high -grade cytology results (cytology in 1 July – 31 December 2018),, by laboratory

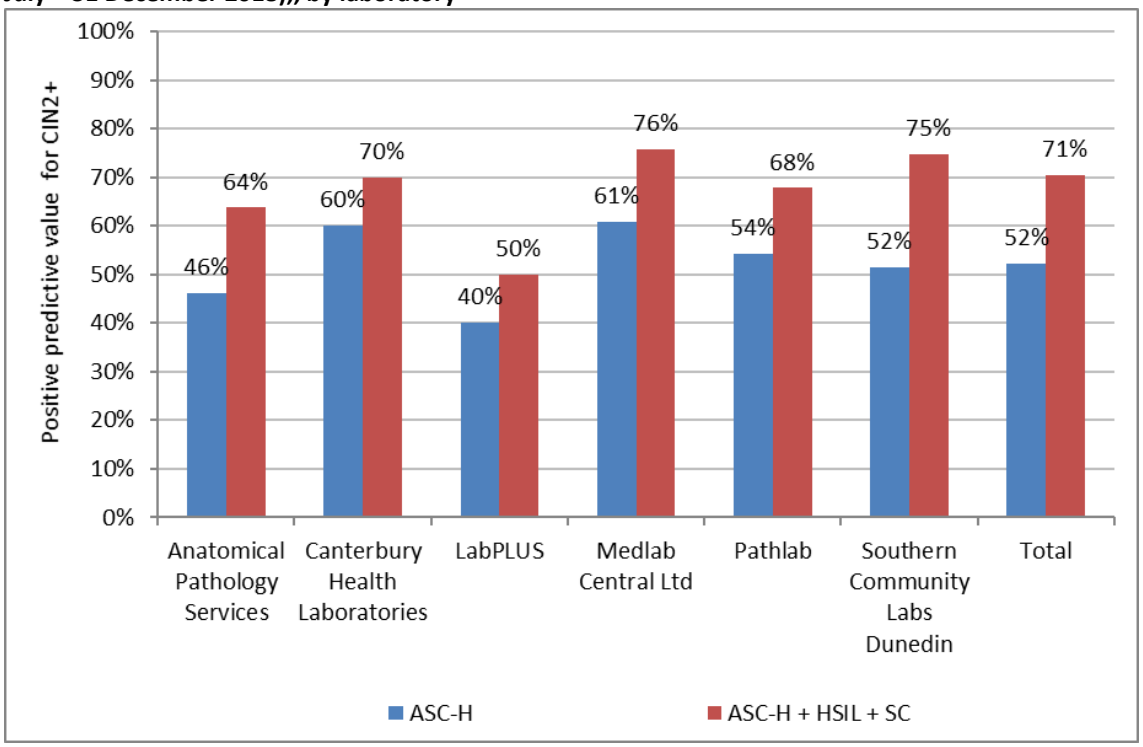
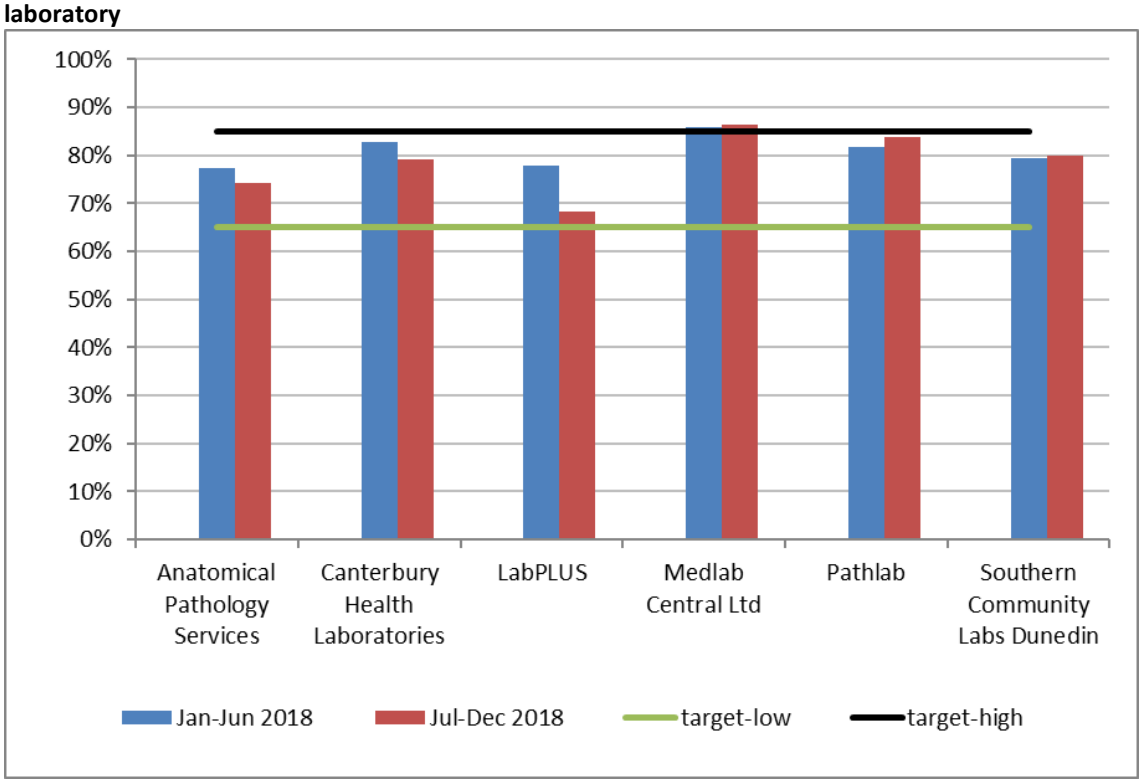
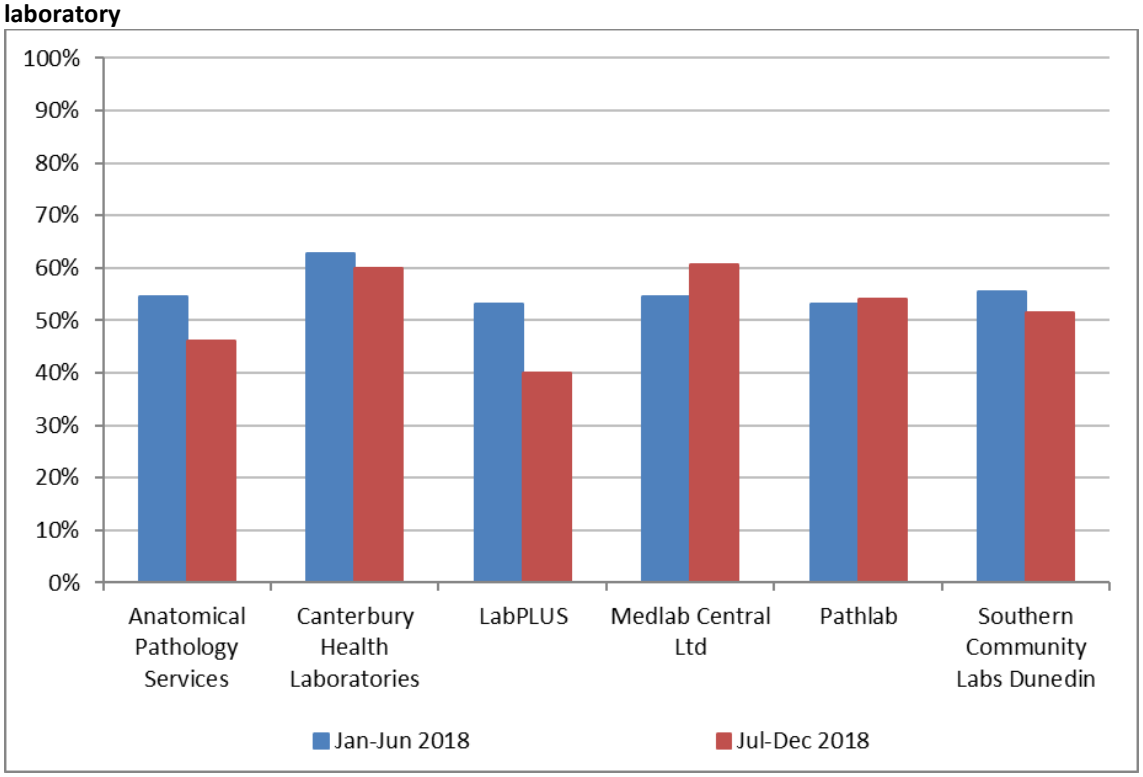


Figure 59 - Trends in the positive predictive value for CIN 2+ in women with HSIL or SC cytology results, by laboratory



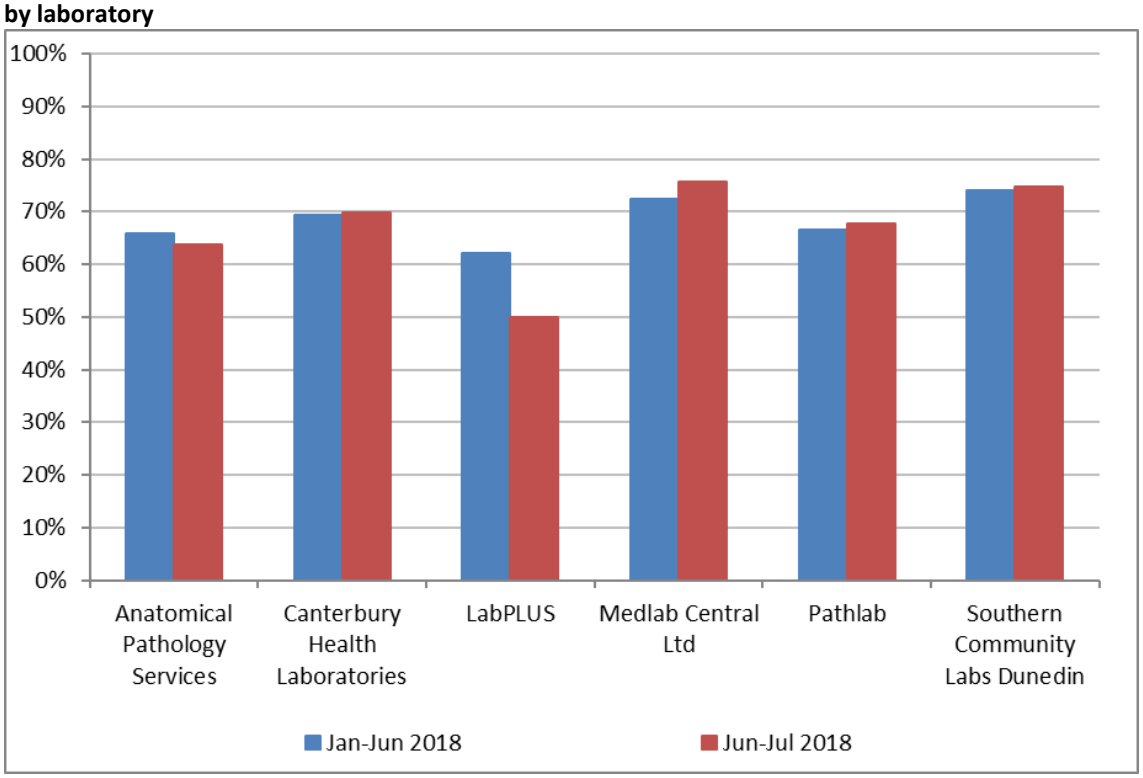
Time period relates to monitoring report period; cytology samples were collected in the period six months prior.

Figure 60 - Trends in the positive predictive value for CIN 2+ in women with ASC-H cytology results, by laboratory



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

Figure 61 - Trends in the positive predictive value for CIN 2+ in women with ASC-H, HSIL or SC cytology results, by laboratory



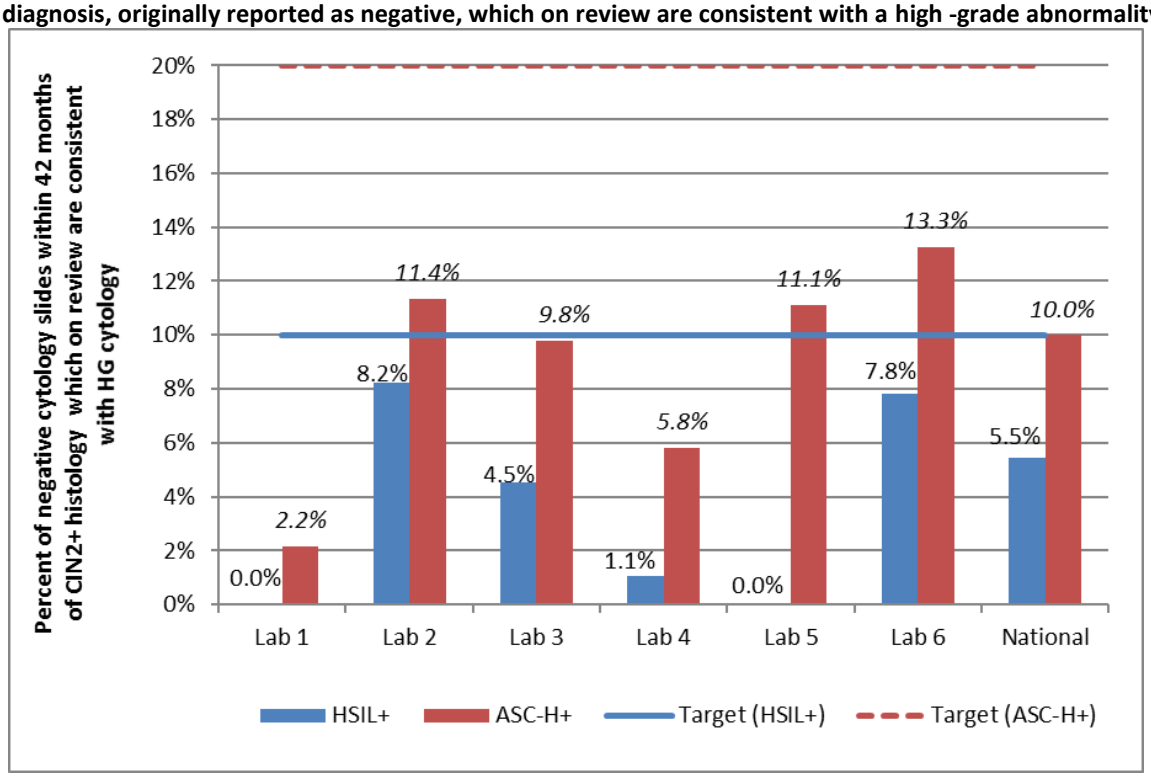
Time period relates to monitoring report period; cytology samples were collected in the period six months prior.

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	Data required for this measure were not available directly from the NCSP Register for the current reporting period, but were provided by the National Screening Unit ina way that did not identify laboratories. Data were provided for women with a histological diagnosis of high -grade/ invasive disease in the period 1 January – 31 December 2018, for whom the previous cervical smear, within the 42 months prior, was negative. Nationally, 5.5% of these previous negative smears were consistent with HSIL+ on review, and 10.0% were consistent with ASC-H+ on review (Figure 62). These results varied by laboratory, from 0.0% to 8.2% for HSIL+ and from 2.2% to 13.2% for ASC-H+ (Figure 62). No laboratory exceeded the targets, and all achieved the additional aim of less than 15% for ASC-H+.
Trends	Overall the proportion of slides that were consistent with a high -grade or worse abnormality is higher in 2018 compared to 2017. Between this report and monitoring report 48, the proportion of negative slides which on review were consistent with HSIL+ increased from 2.6% to 5.5%, and from 5.5% to

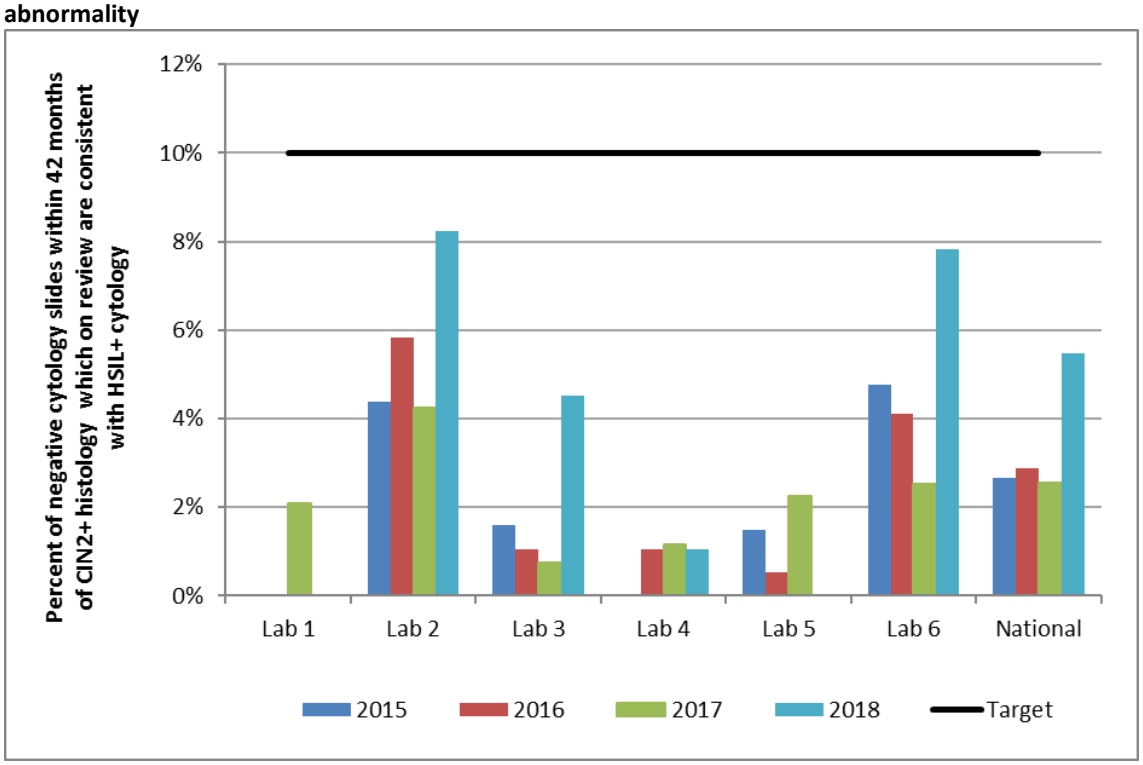
	10.0% for ASC-H+. Trends by laboratory are shown in Figure 63 (HSIL+) and Figure 64 (ASC-H+).
Comments	Laboratories are not identified for this indicator.

Figure 62 - Proportion of cytology slides within the 42 months preceding a high -grade/ invasive histological diagnosis, originally reported as negative, which on review are consistent with a high -grade abnormality



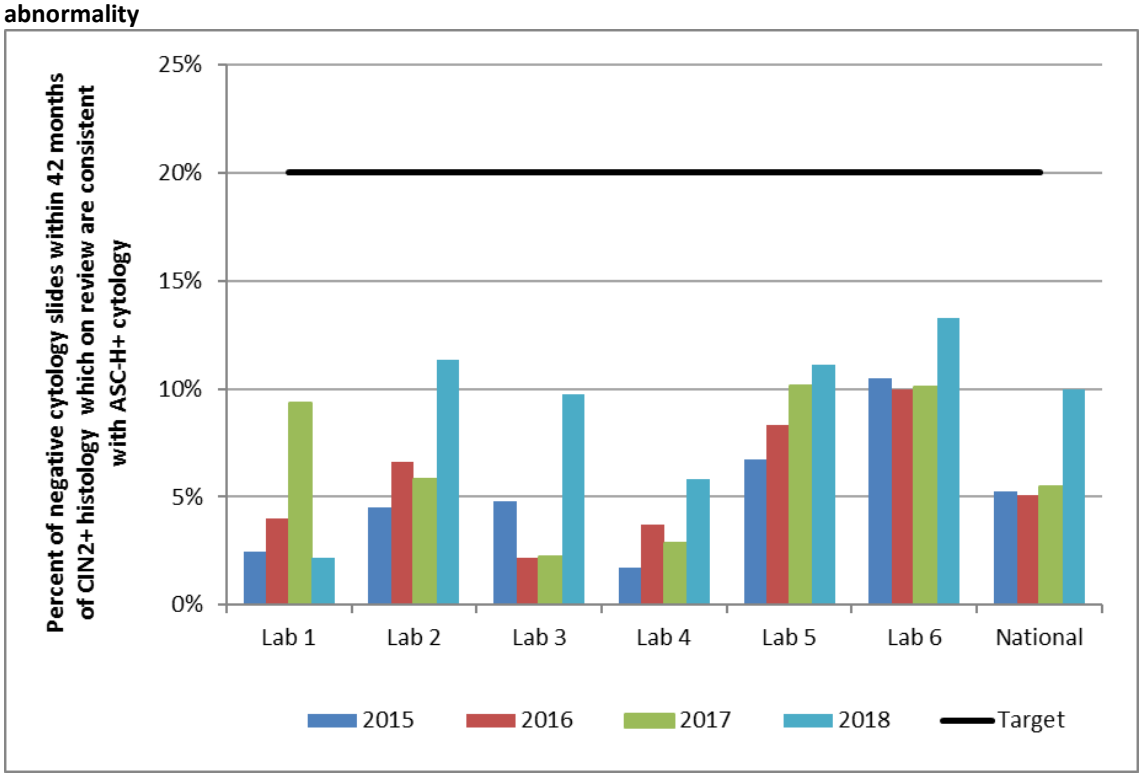
HSIL+ includes cytology interpretation codes HS1, HS2, SC, AIS or AC1-5; ASC-H+ includes cytology interpretation codes ASH, HS1, HS2, SC, AIS, AC1-5 or AG4-5 (see Appendix B – Bethesda 2001 New Zealand Modified).

Figure 63 – Trends in the proportion of cytology slides within the 42 months preceding a high -grade/ invasive histological diagnosis, originally reported as negative, which on review are consistent with HSIL or worse abnormality



HSIL+ includes cytology interpretation codes HS1, HS2, SC, AIS or AC1-5; (see Appendix B – Bethesda 2001 New Zealand Modified).

Figure 64 – Trends in the proportion of cytology slides within the 42 months preceding a high -grade/ invasive histological diagnosis, originally reported as negative, which on review are consistent with ASC-H or worse abnormality



ASC-H+ includes cytology interpretation codes ASH, HS1, HS2, SC, AIS AC1-5 or AG4-5 (see Appendix B – Bethesda 2001 New Zealand Modified).

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 31 December 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	There were 12,239 histology samples taken during the current monitoring period. Of these, 402 (3.3%) were insufficient for diagnosis. These samples were taken from 399 women, 50 (12.5%) of whom have a record of a subsequent sufficient histology test. The remaining 11,837 samples were taken from 10,584 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. 56.5% of women with histology tests had negative or benign histology results (Table 8). 18.5% of women had high -grade squamous (CIN 2/3) histology results and 80 women (0.76%) had adenocarcinoma in situ. There were 71 women (0.67%) with invasive squamous cell carcinoma (ISCC) histology, 8 (0.08%) with microinvasive squamous cell carcinoma (SCC) histology and 45 (0.43%) with invasive adenocarcinoma; 17 (0.16%) were adenocarcinomas arising from the endocervix and and 28 (0.26%) were adenocarcinomas not arising from the endocervix. There were four 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 (1,422, Table 9). Among women aged 20-69 years, the age group with the lowest rate of women with results which were negative/benign was women aged 25-29 years (28.6%; Table 10).

Histology samples were additionally analysed after excluding 2,154 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 36.0% of the women with negative/benign histology. This reduced the proportion with a histology result being negative/benign from 56.5% to 45.4% of all women with a histology sample. After excluding negative/benign histology from hysterectomy samples, this resulted in 45 (0.53%) women with histology having an invasive adenocarcinoma result, including 17 with adenocarcinoma arising from the endocervix (0.2%) and 28 women with adenocarcinoma not arising from the endocervix (0.33%). The most severe histological abnormality detected was HSIL (CIN 2/3) for 22.9% of women; ISCC for 71 (0.84%) of women; microinvasive SCC for 8 (0.1%) women; adenocarcinoma in situ for 80 (0.95%) women; and adenosquamous carcinoma for 4 (<0.05%) 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 1,934 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[13]). 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 (18.4 per 1,000 women screened) and lowest in women aged 60-64 years (2.1 per 1,000 women screened; Figure 65). By ethnicity, Māori women had the highest rates per 1,000 women screened (12.5 per 1,000 women screened) and Asian women the lowest (5.8 per 1,000 women screened; age-standardised to WHO population aged 20-69 years; Table 60, Figure 66).

Trends

The proportion of women with negative or benign histology (56.5%; or 45.4% if benign hysterectomy samples are excluded; Table 8, Table 11) is similar to that reported for the previous period (56.1%; 45.6% if benign hysterectomy samples are excluded). The proportion of women with HSIL histology is lower in this report (18.5%) than in the previous period (19.5%) but CIN1 remained stable (16.8% in both periods). The proportion of women with invasive adenocarcinoma not arising from the endocervix is lower in the current period (0.26% in the current period and 0.37% in the previous period) but adenocarcinoma arising from the endocervixis higher than previously (0.16% in the current period, <0.05% in the previous period). Again, an increase was seen in women with adenocarcinoma in situ (0.76%in this period and 0.63% last period). The proportion increased for women with ISCC (0.67% in this period and 0.48% in the last period).

Trends in detection of CIN 2/3 per 1,000 women screened are shown by ethnicity in Figure 66 and by age in Figure 67. 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 67).

Longer term trends by ethnicity are shown in Figure 68 for selected age groups (20-24 and 25-29), based on those ages which would include a proportion of women who have been vaccinated against HPV (cohorts offered vaccination would have been aged up to 28 in the current monitoring period). As for the results across all women aged 20-24 years, rates of CIN2/3 detection per 1,000 women screened increased in Pacific and European/ Other women aged 20-24 years in the latter half of 2018 compared to the first half of 2018. In women aged 25-29 years, there appears to have been a decline in detection of CIN2/3 per 1,000 women screened between Jul-Dec 2013 and the current monitoring period for Māori women, between Jul-Dec 2014 and the current monitoring period for Pacific women, and between Jul-Dec 2014 and the current monitoring period for European/ Other women. There is no clear trend for Asian women aged 25-29 years.

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, and appears to have improved in the current monitoring period.

In recent reports (since Report 46), a supplementary analysis has been undertaken which excludes 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.

Prior to Report 49, biannual monitoring reports examined trends in high grade abnormalities by looking at the rate of women with CIN 2/3 histology, as a proportion of all women with histology; while trends in the more widely-used standard measure of CIN 2/3 histology per 1,000 women screened was included in Annual Reports (up to 2013). Since Report 49, this latter measure of examining trends in high -grade histological abnormalities has been brought across from the NCSP Annual Reports into the biannual monitoring reports. The

previous measure has been included in this report in Figure 125, to allow comparison with earlier reports.

Apparent declines in CIN 2/3 histology per 1,000 women screened among women aged 20-24 and 25-29 years are consistent with results from other indicators within this report (see Indicator 5.1), and the anticipated effect of HPV vaccination. This is an important indicator that can be monitored regularly to look for the impact of HPV vaccination, and supplements proxy measures such as trends in genital warts, reported elsewhere.[14] Ecological measures such as this have played an important role in many countries in documenting the impact of HPV vaccination,[15] but have well-known limitations. Individual vaccination status is not available on the NCSP Register.

Table 7 - Histology results reporting by SNOMED category

SNOMED category	Women with that diagnosis	
	N	%
Negative/normal	3,218	30.4
Inflammation	645	6.1
Microglandular hyperplasia	10	0.09
Squamous metaplasia	330	3.1
Polyp	1,410	13.3
Other*	369	3.5
Atypia	39	0.37
Benign glandular atypia	2	<0.05
HPV	603	5.7
Condyloma acuminatum	6	0.06
CIN 1 (LSIL) or VAIN 1	1,704	16.1
Dysplasia/CIN NOS	39	0.37
Glandular dysplasia	-	-
CIN 2 (HSIL) or VAIN 2	761	7.2
HSIL not otherwise specified	27	0.26
CIN 3 (HSIL) or VAIN 3	1,173	11.1
Adenocarcinoma in situ	80	0.76
Microinvasive squamous cell carcinoma	8	0.08
Invasive squamous cell carcinoma	71	0.67
Adenocarcinoma endocervical type	17	0.16
Invasive adenocarcinoma (not endocervical type)	28	0.26
Adenosquamous carcinoma	4	<0.05
Undifferentiated carcinoma	3	<0.05
Sarcoma	3	<0.05
Carcinosarcoma	1	<0.05
Choriocarcinoma	-	-
Miscellaneous primary tumour	2	<0.05
Metastatic tumour	19	0.18
Small cell carcinoma	-	-
Malignant tumour, small cell type	-	-
Melanoma	2	<0.05
Other primary epithelial malignancy	10	0.09
Total	**10,584**	**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)	5,984	56.5
HPV	609	5.8
CIN1	1,782	16.8
Glandular dysplasia	-	-
CIN2	761	7.2
HSIL not otherwise specified	27	0.26
CIN3	1,173	11.1
Adenocarcinoma in situ	80	0.76
Microinvasive	8	0.08
Invasive squamous cell carcinoma	71	0.67
Adenocarcinoma endocervical type	17	0.16
Invasive adenocarcinoma (not endocervical type)	28	0.26
Adenosquamous carcinoma	4	<0.05
Other cancer	40	0.38
Total	**10,584**	**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

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+**	**Total**
Negative/benign (non neoplastic)	15	326	369	456	575	807	1,075	820	586	389	294	272	5,984
HPV	3	97	102	96	65	60	53	60	31	24	11	7	609
CIN1	4	364	358	268	217	162	144	97	72	44	40	12	1,782
Glandular dysplasia	-	-	-	-	-	-	-	-	-	-	-	-	-
CIN2	2	168	165	132	81	70	54	33	25	14	10	7	761
HSIL not otherwise specified	-	2	4	8	5	1	5	-	2	-	-	-	27
CIN3	3	138	274	273	171	124	66	37	35	27	16	9	1,173
Adenocarcinoma in situ	1	1	13	31	12	7	8	3	-	1	3	-	80
Microinvasive	-	-	1	2	1	2	1	1	-	-	-	-	8
Invasive squamous cell carcinoma	-	1	3	10	11	5	9	7	4	6	3	12	71
Adenocarcinoma endocervical type	-	-	2	3	1	1	3	4	1	2	-	-	17
Invasive adenocarcinoma (not endocervical type)	-	-	-	2	2	3	-	3	2	1	2	13	28
Adenosquamous carcinoma	-	-	-	-	-	-	2	-	2	-	-	-	4
Other cancer	-	-	1	2	3	-	2	4	5	6	4	13	40
Total	**28**	**1,097**	**1,292**	**1,283**	**1,144**	**1,242**	**1,422**	**1,069**	**765**	**514**	**383**	**345**	**10,584**

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)	53.6	29.7	28.6	35.5	50.3	65.0	75.6	76.7	76.6	75.7	76.8	78.8
HPV	10.7	8.8	7.9	7.5	5.7	4.8	3.7	5.6	4.1	4.7	2.9	2.0
CIN1	14.3	33.2	27.7	20.9	19.0	13.0	10.1	9.1	9.4	8.6	10.4	3.5
Glandular dysplasia	-	-	-	-	-	-	-	-	-	-	-	-
CIN2	7.1	15.3	12.8	10.3	7.1	5.6	3.8	3.1	3.3	2.7	2.6	2.0
HSIL not otherwise specified	-	0.18	0.31	0.62	0.44	0.08	0.35	-	0.26	-	-	-
CIN3	10.7	12.6	21.2	21.3	14.9	10.0	4.6	3.5	4.6	5.3	4.2	2.6
Adenocarcinoma in situ	3.6	0.09	1.0	2.4	1.05	0.56	0.56	0.28	-	0.19	0.78	-
Microinvasive	-	-	0.08	0.16	0.09	0.16	0.07	0.09	-	-	-	-
Invasive squamous cell carcinoma	-	0.09	0.23	0.78	0.96	0.40	0.63	0.65	0.52	1.17	0.8	3.5
Adenocarcinoma endocervical type	-	-	-	0.16	0.17	0.24	-	0.28	0.26	0.19	0.5	3.77
Invasive adenocarcinoma (not endocervical type)	-	-	0.15	0.23	0.09	0.08	0.21	0.37	0.13	0.4	-	-
Adenosquamous carcinoma	-	-	-	-	-	-	0.14	-	0.26	-	-	-
Other cancer	-	-	0.08	0.16	0.26	-	0.14	0.37	0.65	1.17	1.0	3.8
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)	3,830	45.4
HPV	609	7.2
CIN1	1,782	21.1
Glandular dysplasia	-	-
CIN 2	761	9.0
HSIL not otherwise specified	-	-
CIN 3	1,173	13.9
Adenocarcinoma in situ	80	0.95
Microinvasive	8	0.09
Invasive squamous cell carcinoma	71	0.84
Invasive adenocarcinoma (arising from the endocervix)	17	0.20
Invasive adenocarcinoma (not arising from the endocervix)	28	0.33
Adenosquamous carcinoma	4	<0.05
Other cancer	40	0.47
Total	**8,430**	**100.0**

**Partial with cervical component. Details of mapping between SNOMED category and diagnostic category are included in Appendix C. Results differ from those in Table 8 due to the exclusion of negative/ benign results from partial/ total hysterectomy samples.*
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.

Figure 65 - Rate of women with CIN 2/3 per 1,000 women screened, by age and ethnicity for the period 1 July – 31 December 2018

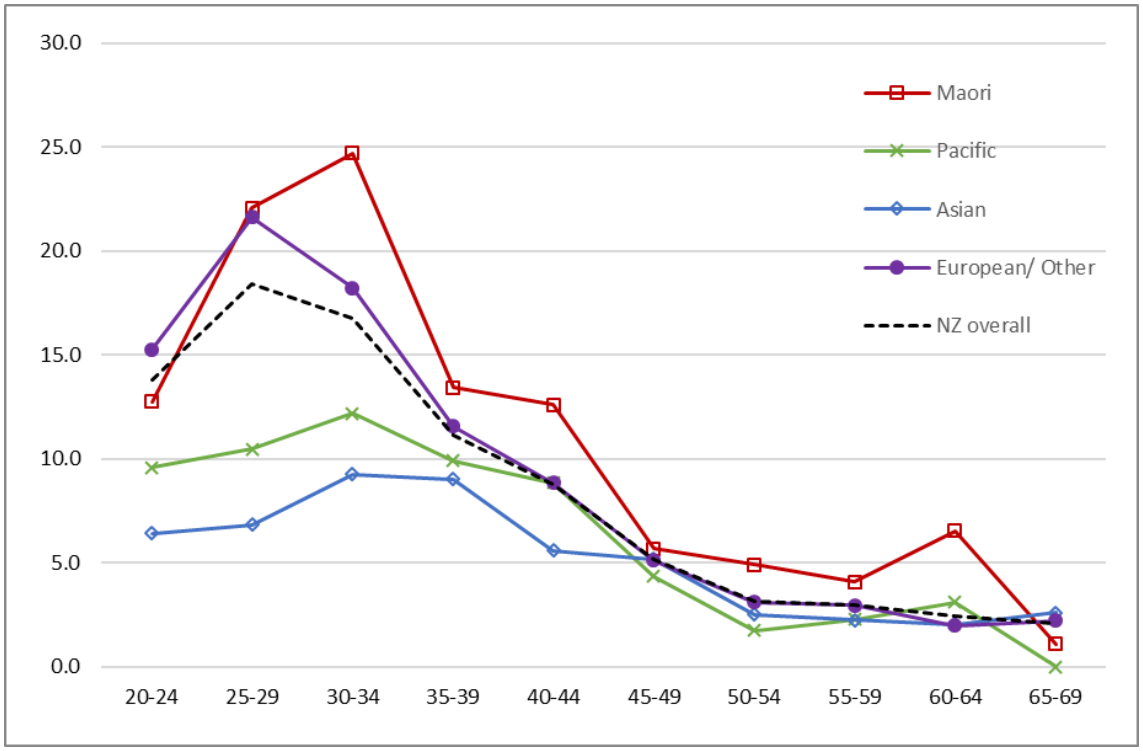
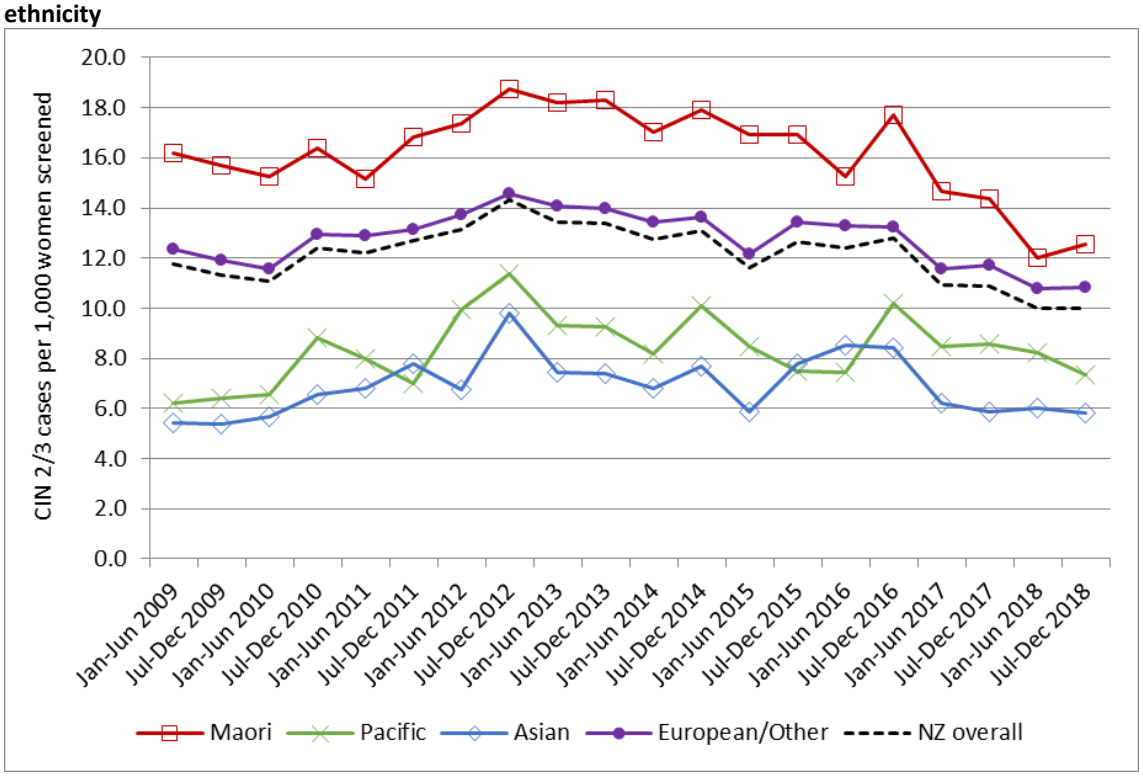


Figure 66 - Trends in the age standardised rate of women with CIN 2/3 per 1,000 women screened, by ethnicity



Age-standardised rate, standardised to the WHO population (ages 20-69 years)[13].

Figure 67 - Trends in the rate of women with CIN 2/3 per 1,000 women screened, by age

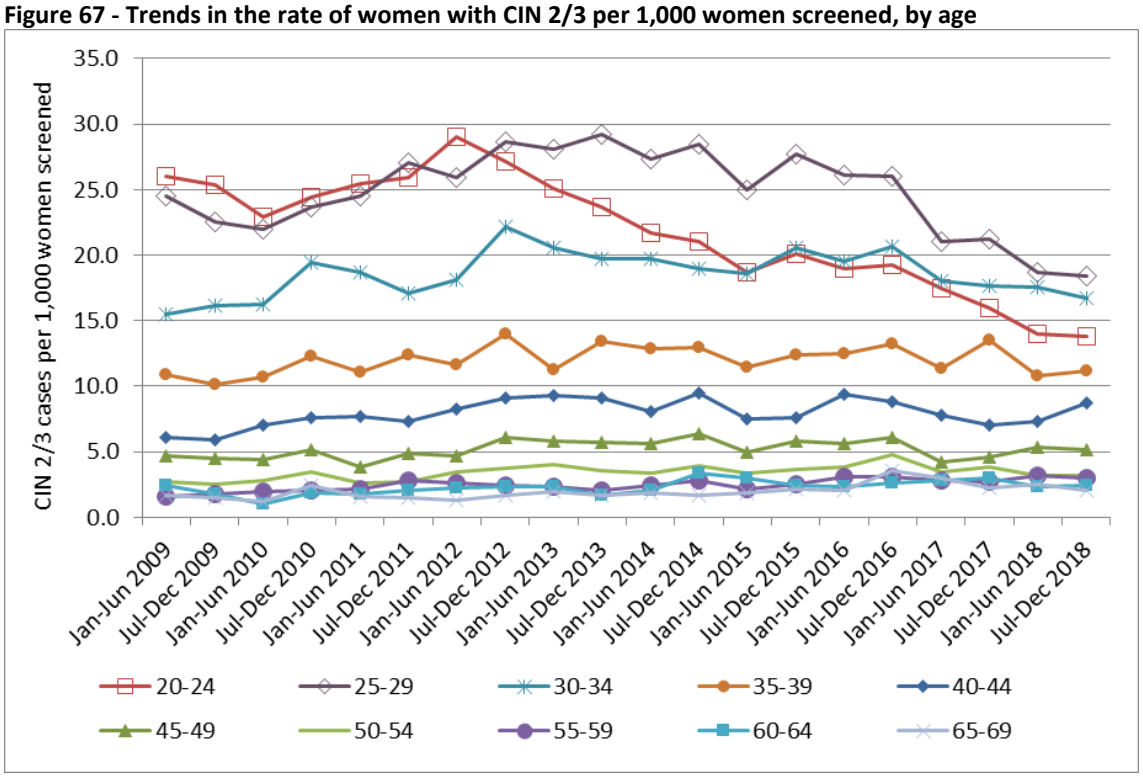
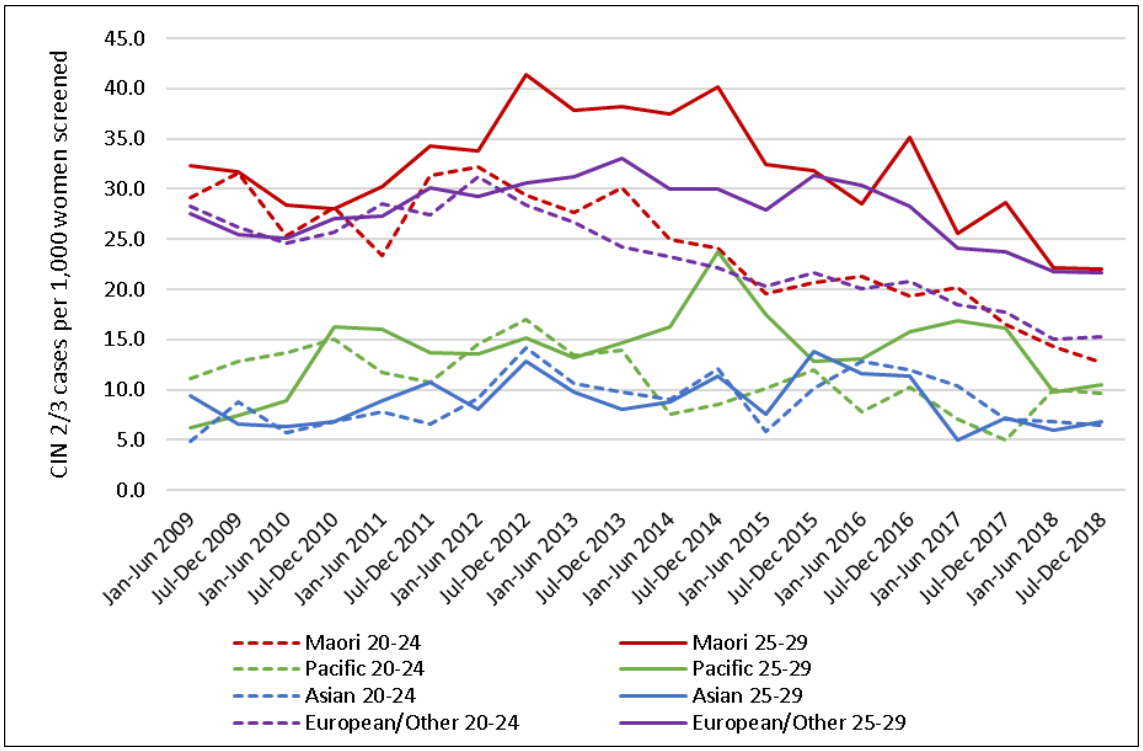


Figure 68 - Trends in the rate of women with CIN 2/3 per 1,000 women screened, by ethnicity and selected ages



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[16]). ***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[16]). ***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 214,435 cytology samples during the current monitoring period. Overall, 96.9% of cytology samples were reported on within seven working days, which meets the target of 90% (Table 63). Nationally, 99.2% were reported on within 15 working days, which meets the target of 98%. All six laboratories met the target for 90% of cytology samples to be reported to sample takers in seven working days or less (Figure 69, Table 63). All six of the laboratories also met the target of 98% of samples reported within 15 working days (Figure 70, Table 63).

Histology

Fourteen laboratories received 12,256 histology samples in the current monitoring period. Overall, 92.9% of samples were reported on within ten working days, which meets the target of 90%. Nationally, 97.2% were reported on in 15 working days or less, which is below the target of 98% (Table 64). Eight of the fourteen 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, Nelson Hospital Laboratory, North Shore Hospital Laboratory, Northland DHB Laboratory, Southern Community Labs Dunedin, Southern Community Labs Wellington, Taranaki Medlab; Figure 71). Seven laboratories met the target of 98% of final histology results reported to the requestor within 15 working days of receiving the sample (Figure 72, Table 64). Three of the seven remaining laboratories reported on at least 95% of samples within 15 days (Figure 72, Table 64). The proportion of histology samples reported on within 15 days ranged from 83.1% (Waikato Hospital Laboratory) to all samples (Taranaki Medlab).

Low-grade cytology with associated HPV triage testing

Six laboratories received 3,198 cytology samples during the current monitoring period which were associated with HPV testing for the purpose of triage of low-grade abnormalities. Overall, 99.2% 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 97.4% (Canterbury Health Laboratories) to 99.5% (Anatomical Pathology Services and Southern Community Labs Dunedin; Figure 73, Table 65).

The target of 98% of tests reported within 15 working days was met by five of the six laboratories. Nationally, the proportion of cytology reported within 15 days for cytology associated with low-grade triage HPV testing (99.2%) was similar to the cytology reported overall (99.2%). 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 73). Only Canterbury Health Laboratories reported below the target level for cytology associated with low-grade triage HPV testing (97.4%) but achieved the target for cytology overall (99.4%).

Trends

Cytology

The overall proportion of samples reported on within seven working days in the current report (96.9%) is higher than the proportion reported in the previous monitoring period (94.9%). All six laboratories met the target in this monitoring period which is two more laboratories compared to the previous reporting period. The proportion of samples reported on within 15 working days was similar in the previous monitoring period (99.2%). All six laboratories met the target of reporting 98% of samples within 15 working days, which was the same in the previous report.

Histology

The proportion of histology samples reported on within ten working days has slightly increased in this report (from 92.3% to 92.9%). Eight laboratories

achieved the ten-working-days target in this monitoring period, the same as in the last period. The proportion of histology samples reported on within 15 working days is similar to the previous report (97.2%, compared to 96.9% in the previous report). Seven laboratories met the target in this period compared to five in the previous report. In the current period, ten of the fourteen laboratories had reported on at least 95% of samples within 15 days, which is one less 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 99.3% to 99.2%. One additional laboratory met the target of reporting 98% of final cytology test results within 15 working days.

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.

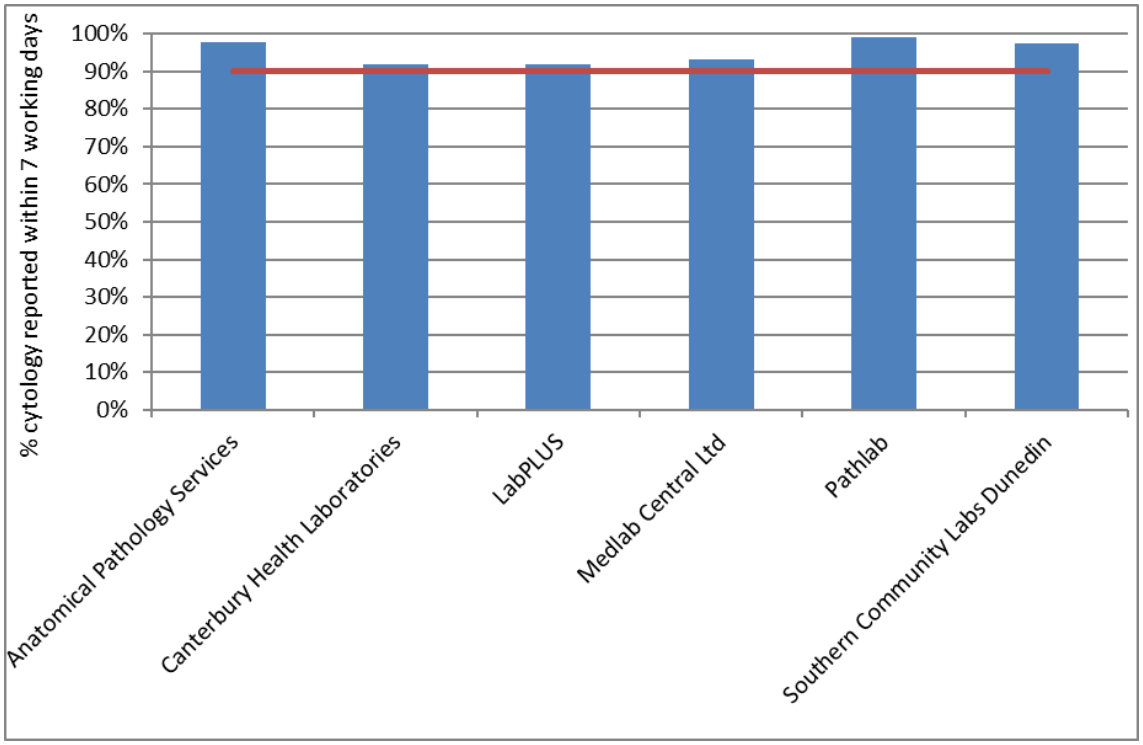
Turnaround time performance may be underestimated due to limitations in the report date recorded on the NCSP Register. When amended reports are sent to the NCSP Register, the report date in the NCSP Register is updated to reflect the date on which the report was re-transmitted after the amendments are 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.

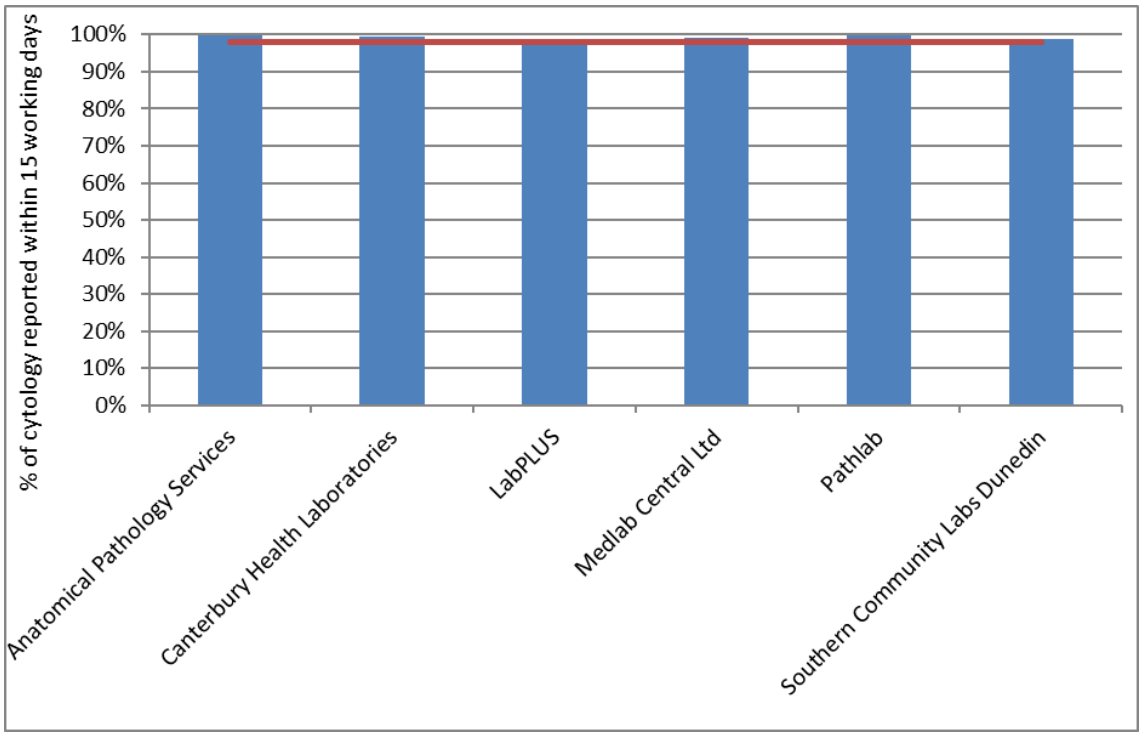
Caution must be taken when comparing percentages of reporting from this monitoring period to previous monitoring periods due to changes in the number of reporting laboratories. Differences in percentages from this and previous monitoring reports may be due to differences in caseloads.

Figure 69 - Proportion of cytology samples reported within seven working days by laboratory, 1 July – 31 December 2018



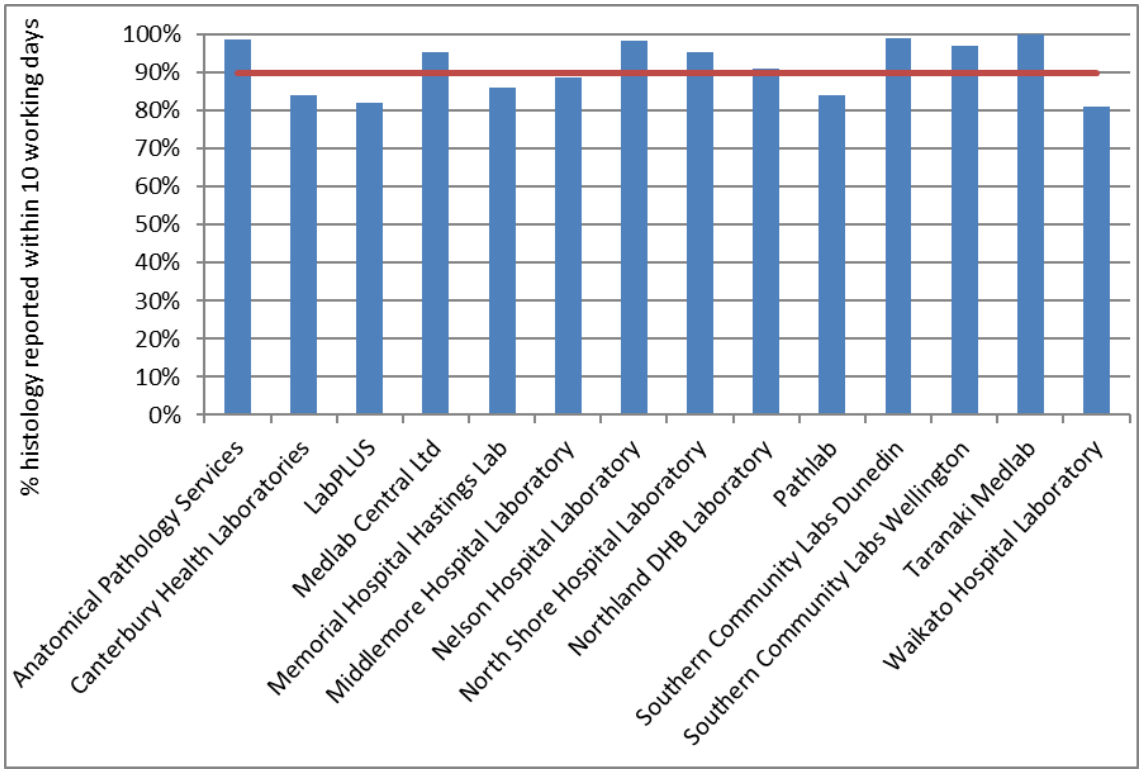
Target: 90% within seven working days (red line).

Figure 70 - Proportion of cytology samples reported within 15 working days by laboratory, 1 July – 31 December 2018



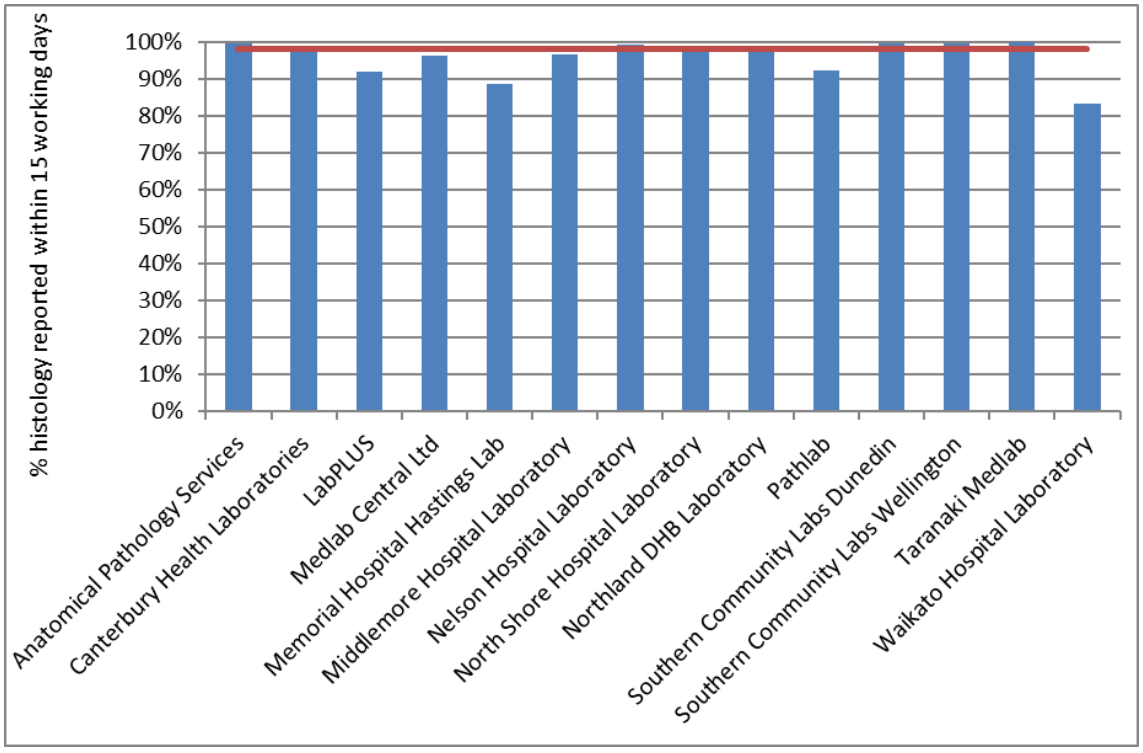
Target: 98% within 15 working days (red line).

Figure 71 - Proportion of histology samples reported within ten working days by laboratory, 1 July – 31 December 2018



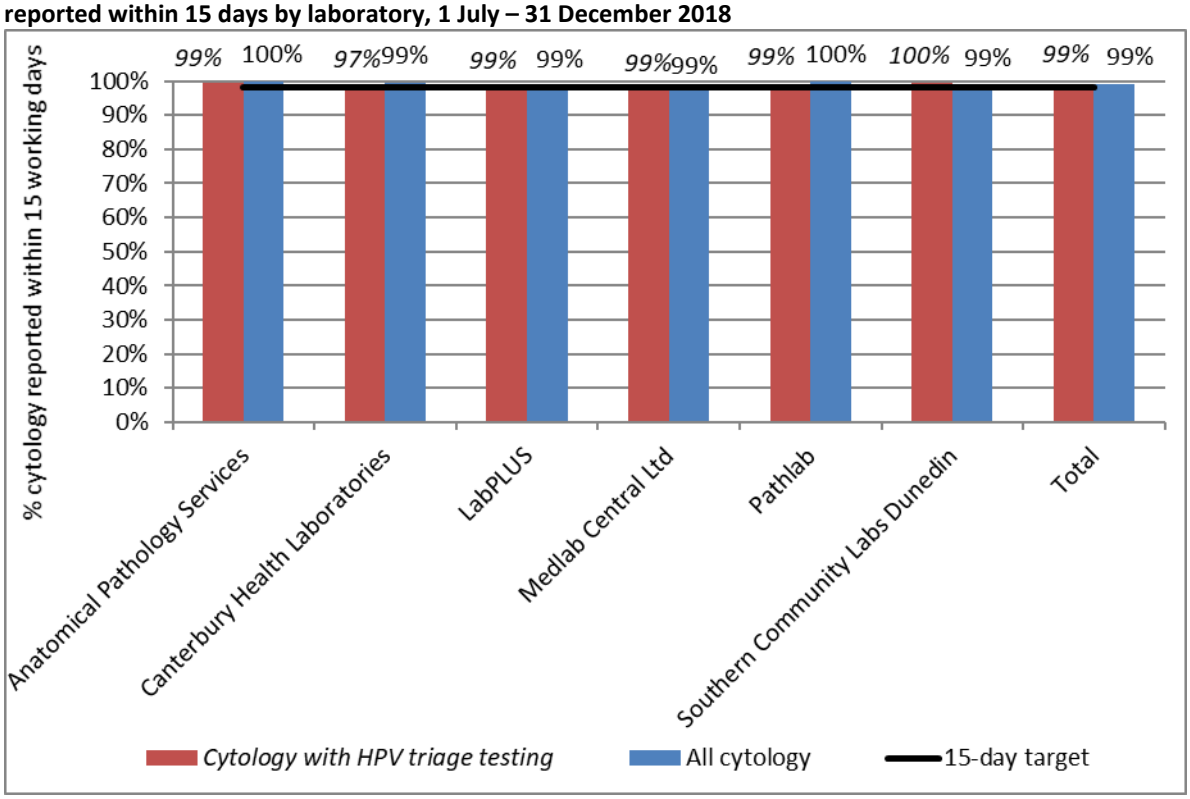
Target: 90% within ten working days (red line).

Figure 72 - Proportion of histology samples reported within 15 working days by laboratory, 1 July – 31 December 2018



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

Figure 73 - Proportion of cytology samples with associated HPV triage testing and of all cytology samples reported within 15 days by laboratory, 1 July – 31 December 2018



Target: 98% within 15 working days (black 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 January - 30 June 2018), 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)[17] 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 31 December 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 3,043 high -grade cytology results relating to samples collected in the period 1 January - 30 June 2018; 1,154 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 1,889 cytology results, which related to 1,882 women. Histological follow-up for these remaining 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, 1,578 (83.8%) had a histology report within 90 days of their cytology report, and 1,666 (88.5%) 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 73.1% (Counties Manukau) to 91.7% (West Coast) within 90 days of their cytology report, and from 80.7% (Counties Manukau) to 100.0% (West Coast) within 180 days of their cytology report (Figure 74, Table 12). Two DHBs met the target for the proportion of women with histology within 90 days (Canterbury and West Coast, with 90.9% and 91.7% of histology reported within 90 days of a high -grade cytology report, respectively), and one DHB met the target for 180 days (West Coast, 100%). 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 16 and 12 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 66.1% (ages 65-69) to 88.4% (ages 40-44 years) within 90 days, with the target not met for any age group. The target was not met in any age group for 180 days either and ranged from 73.2% (ages 65-69 years) to 94.3% (ages 35-39 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 74.0% (Pacific women) to 86.1% (European/ Other woman; Table 14). By 180 days, however, the difference had slightly narrowed, and the proportion with histology reports ranged from 81.3% (Pacific women) to 90.1% (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 66 and Table 67.

Among women with an urgent referral, due to a suspicion of invasive disease, (N=65), a histology report was available within 90 days for 84.6% of women and within 180 days for 90.8% 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), 83.8% had a histology report available within 90 days and 88.4% 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 160 women (8.5%) who had no record of any subsequent follow-up within 90 days and 104 women (5.5%) who had no record of any subsequent follow-up within 180 days on the NCSP Register, in the data provided for this report (Table 17).

This varied by DHB, from no women without follow-up (Wairarapa) to 18.8% (Counties Manukau) of women without a record of follow-up of some kind by 90 days, and from no women (Wairarapa, West Coast and Whanganui) to 12.2% (Counties Manukau) of women without a record of follow-up of some kind by 180 days Figure 75, 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 16 DHBs) and was a maximum of 37 women (18.8%) in Counties Manukau. At 180 days, the number remaining without a record of follow-up was ten or fewer in 18 DHBs, with a maximum of 24 women (12.2%) without a record of follow-up also in Counties Manukau.

The proportion of women who had no record of any subsequent follow-up also varied by ethnicity, from 6.6%% (European/ Other women) to 19.8% (Pacific women) at 90 days and from 4.4% (European/ Other women) to 12.5% (Pacific women) at 180 days (Table 18, Figure 76).

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 89.2% of women and 90.8% within 180 days (Table 16). At 180 days, there remained six women (9.2%)for whom no follow-up tests were recorded. Among women where there was no suspicion of invasive disease, 91.6% had a follow-up test report available within 90 days and 94.6% within 180 days (Table 16). At 180 days, there remained 98 women (5.4%) for whom no follow-up tests were recorded.

Trends

Histological follow-up

The proportion of women with a histology report within 90 days is slightly lower since the previous monitoring period (from 84.0% to 83.8% in the current period). The proportion of women with a histology report within 180 days is lower (from 89.1% to 88.5% in the current period).

The proportion of women with histological follow-up at 90 days and 180 days still varies for individual DHBs (Figure 77, Figure 78). In nine DHBs the

proportion of women with histological follow-up is lower at 90 days (Counties Manukau, Hawke's Bay, Lakes, Mid Central, Nelson Marlborough, South Canterbury, Southern, Waitemata and Whanganui) and in eleven DHBs at 180 days (Canterbury, Counties Manukau, Hawke's Bay, Hutt Valley, Mid Central, Nelson Marlborough, South Canterbury, Southern, Wairarapa, Waitemata and Whanganui).

The proportion of women with follow-up histology at 90 days in the current monitoring period is higher than in the previous report for Pacific women (from 71.1% to 74.0%) and European/ Other women (from 85.4% to 86.1%); and is lower for Māori women (from 80.3% to 78.2%) and Asian women (from 86.5% to 82.7%).The proportion of women with follow-up histology at 180 days has remained similar for Pacific, Asian and European/ Other women (from 80.7% to 81.3%, 89.4% to 89.6% and 90.3% to 90.1%, respectively) and decreased for Māori women (from 86.2% to 83.4%). The proportions of women with follow-up histology are quite variable within individual DHBs when broken down by 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 79 and Figure 80.

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 25-29, 40-44, 55-59 and 65-69 years, for both 90 and 180 days, only 20-24 and 50-54 years at 180 days, and only 35-39 years at 90 days.

Women with no follow-up tests

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

Trends by DHB were complex, but the proportion of women with no follow-up test recorded at 180 days reduced in ten of the twenty DHBs, and the reductions were greatest in Hawke's Bay (decrease from 18.2% to 0.0%). Increases were observed in the remaining ten DHBs and was largest in Hawke’s Bay (increase from 0.0% to 5.1%).

In the current monitoring period, the proportion of women for whom there was no follow-up test recorded is higher at 90 days between the current and previous monitoring reports for all ethnics groups except Asian women (Māori women from 12.6% to 13.0%; Pacific women from 18.1% to 19.8%; European/ Other women from 6.3% to 6.6%; and Asian women, 9.4% to 8.7%). At 180 days there was an increase in the number of women with no follow-up for Māori women (from 8.2% to 8.8%), Pacific women (from 12.0% to 12.5%) and European/ Other women (from 4.1% to 4.4%) but a decrease for Asian women (from 8.2% to 3.6%).

Comments

The proportion of women with a follow-up test of any kind provides useful additional information. While 16.2% 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 (8.5%). The same was also true at 180 days, where 11.5% 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 small numbers of 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. Analyses undertaken for the related performance measure, Indicator 7.1, show that women with abnormal glandular results consistent with adenocarcinoma (Bethesda codes AC1-5) were less likely to have a colposcopy referral recorded than other women with cytological suspicion of invasive disease (Table 71). 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 six 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 measre 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.

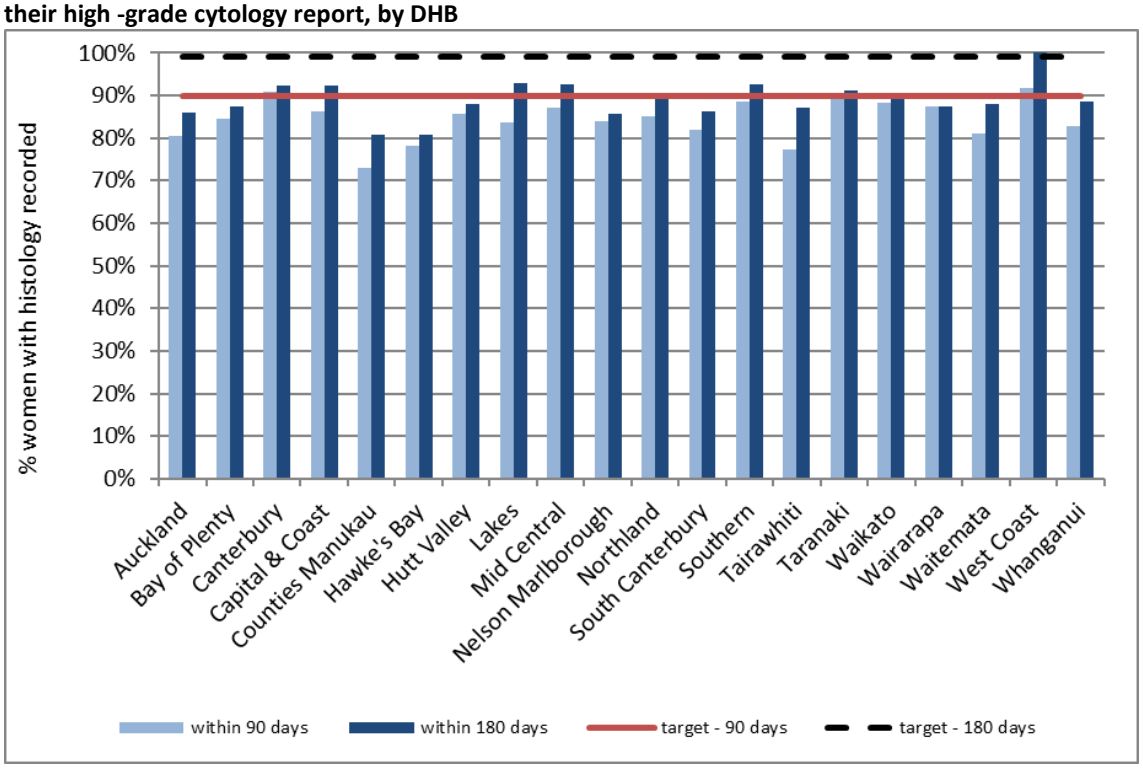
The risk level for women with no recorded biopsy is difficult to ascertain because a lack of histology can be due to a number of reasons, including:

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 74 - Proportion of women (ages 20-69) 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	205	165	80.5	176	85.9
Bay of Plenty	103	87	84.5	90	87.4
Canterbury	220	200	90.9	203	92.3
Capital & Coast	131	113	86.3	121	92.4
Counties Manukau	197	144	73.1	159	80.7
Hawke's Bay	78	61	78.2	63	80.8
Hutt Valley	42	36	85.7	37	88.1
Lakes	43	36	83.7	40	93.0
Mid Central	108	94	87.0	100	92.6
Nelson Marlborough	56	47	83.9	48	85.7
Northland	60	51	85.0	54	90.0
South Canterbury	22	18	81.8	19	86.4
Southern	149	132	88.6	138	92.6
Tairawhiti	31	24	77.4	27	87.1
Taranaki	46	41	89.1	42	91.3
Waikato	127	112	88.2	115	90.6
Wairarapa	16	14	87.5	14	87.5
Waitemata	201	163	81.1	177	88.1
West Coast	12	11	91.7	12	100.0
Whanganui	35	29	82.9	31	88.6
Total	**1,882**	**1,578**	**83.8**	**1,666**	**88.5**

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

Age group	High -grade cytology	Follow-Up histology Within 90 days		Follow-up histology Within 180 days	
	N	N	%	N	%
<20	1	1	100.0	1	100.0
20-24	249	219	88.0	223	89.6
25-29	398	351	88.2	361	90.7
30-34	392	343	87.5	358	91.3
35-39	209	180	86.1	197	94.3
40-44	146	129	88.4	135	92.5
45-49	124	104	83.9	111	89.5
50-54	91	70	76.9	75	82.4
55-59	95	64	67.4	74	77.9
60-64	77	51	66.2	58	75.3
65-69	56	37	66.1	41	73.2
70+	44	29	65.9	32	72.7
Total	**1,882**	**1,578**	**83.8**	**1,666**	**88.5**

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

DHB	Māori		Pacific		Asian		European/ Other	
	N	%	N	%	N	%	N	%
Auckland	8	61.5	12	80.0	35	83.3	110	81.5
Bay of Plenty	16	94.1	3	100.0	1	50.0	67	82.7
Canterbury	20	95.2	4	80.0	10	100.0	166	90.2
Capital & Coast	10	76.9	5	71.4	12	92.3	86	87.8
Counties Manukau	31	70.5	21	61.8	29	76.3	63	77.8
Hawke's Bay	17	70.8	1	50.0	2	66.7	41	83.7
Hutt Valley	7	87.5	4	100.0	-	-	25	83.3
Lakes	8	72.7	2	100.0	2	100.0	24	85.7
Mid Central	19	82.6	3	75.0	4	80.0	68	89.5
Nelson Marlborough	6	85.7	3	100.0	-	-	38	82.6
Northland	12	66.7	-	-	-	-	39	92.9
South Canterbury	1	100.0	-	-	2	100.0	15	78.9
Southern	9	75.0	4	100.0	8	80.0	111	90.2
Tairawhiti	10	66.7	1	100.0	-	-	13	86.7
Taranaki	4	100.0	2	100.0	1	100.0	34	87.2
Waikato	31	88.6	1	50.0	4	100.0	76	88.4
Wairarapa	6	100.0	-	-	1	100.0	7	77.8
Waitemata	17	68.0	4	57.1	30	78.9	112	85.5
West Coast	1	100.0	-	-	1	100.0	9	90.0
Whanganui	7	77.8	1	100.0	1	100.0	20	83.3
Total	**240**	**78.2**	**71**	**74.0**	**143**	**82.7**	**1,124**	**86.1**

'– ' 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

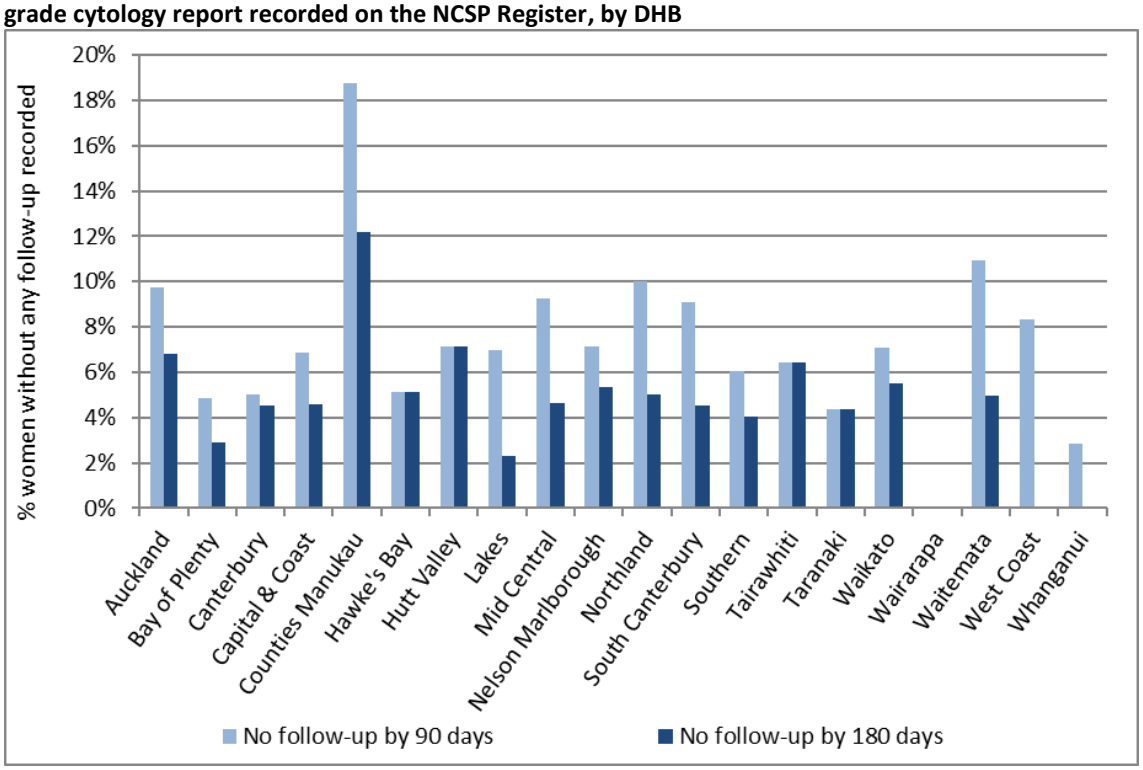
DHB	Māori		Pacific		Asian		European/ Other	
	N	%	N	%	N	%	N	%
Auckland	9	69.2	13	86.7	37	88.1	117	86.7
Bay of Plenty	16	94.1	3	100.0	2	100.0	69	85.2
Canterbury	20	95.2	4	80.0	10	100.0	169	91.8
Capital & Coast	11	84.6	5	71.4	13	100.0	92	93.9
Counties Manukau	35	79.5	23	67.6	32	84.2	69	85.2
Hawke's Bay	17	70.8	1	50.0	3	100.0	42	85.7
Hutt Valley	7	87.5	4	100.0	-	-	26	86.7
Lakes	9	81.8	2	100.0	2	100.0	27	96.4
Mid Central	20	87.0	3	75.0	5	100.0	72	94.7
Nelson Marlborough	6	85.7	3	100.0	-	-	39	84.8
Northland	14	77.8	-	-	-	-	40	95.2
South Canterbury	1	100.0	-	-	2	100.0	16	84.2
Southern	10	83.3	4	100.0	9	90.0	115	93.5
Tairawhiti	12	80.0	1	100.0	-	-	14	93.3
Taranaki	4	100.0	2	100.0	1	100.0	35	89.7
Waikato	31	88.6	2	100.0	4	100.0	78	90.7
Wairarapa	6	100.0	-	-	1	100.0	7	77.8
Waitemata	20	80.0	7	100.0	32	84.2	118	90.1
West Coast	1	100.0	-	-	1	100.0	10	100.0
Whanganui	7	77.8	1	100.0	1	100.0	22	91.7
Total	**256**	**83.4**	**78**	**81.3**	**155**	**89.6**	**1177**	**90.1**

' – ' 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	55	84.6	1,523	83.8
- any follow-up	58	89.2	1,664	91.6
- no follow-up	7	10.8	153	8.4
Follow-up within 180 days				
- histology	59	90.8	1,607	88.4
- any follow-up	59	90.8	1,719	94.6
- no follow-up	6	9.2	98	5.4

Figure 75 - Proportion of women without any follow-up test within 90 days and within 180 days of a high - grade cytology report recorded on the NCSP Register, by DHB



There were no women without follow-up recorded within 180 days in Wairarapa, West Coast and Whanganui.

Figure 76 - Proportion of women without any follow-up test within 90 days and within 180 days of a high - grade cytology report recorded on the NCSP Register, by ethnicity

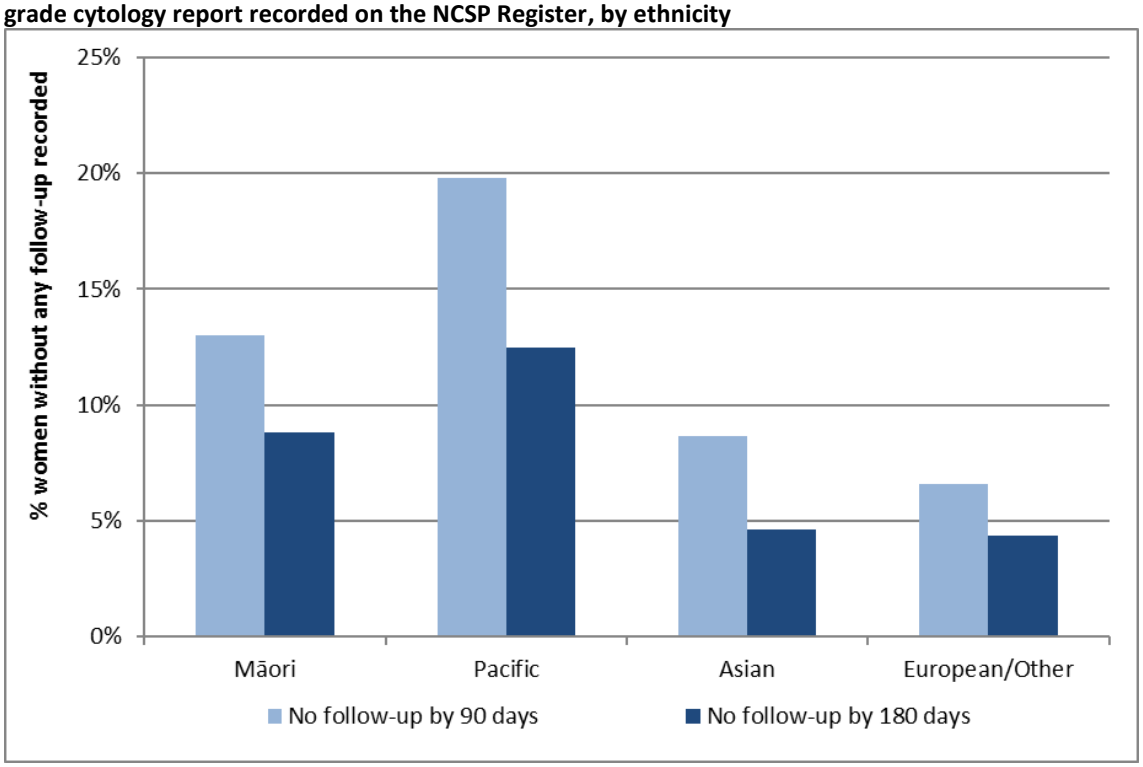


Table 17 - Women without any follow-up test within 90 and 180 days of a high -grade cytology report recorded on the NCSP Register, by DHB

DHB	High -grade cytology	Without a follow-up test by 90 days		Without a follow-up test by 180 days	
	N	N	%	N	%
Auckland	205	20	9.8	14	6.8
Bay of Plenty	103	5	4.9	3	2.9
Canterbury	220	11	5.0	10	4.5
Capital & Coast	131	9	6.9	6	4.6
Counties Manukau	197	37	18.8	24	12.2
Hawke's Bay	78	4	5.1	4	5.1
Hutt Valley	42	3	7.1	3	7.1
Lakes	43	3	7.0	1	2.3
Mid Central	108	10	9.3	5	4.6
Nelson Marlborough	56	4	7.1	3	5.4
Northland	60	6	10.0	3	5.0
South Canterbury	22	2	9.1	1	4.5
Southern	149	9	6.0	6	4.0
Tairawhiti	31	2	6.5	2	6.5
Taranaki	46	2	4.3	2	4.3
Waikato	127	9	7.1	7	5.5
Wairarapa	16	-	-	-	0.0
Waitemata	201	22	10.9	10	5.0
West Coast	12	1	8.3	-	0.0
Whanganui	35	1	2.9	-	0.0
Unspecified	-	-		-	
Total	**1,882**	**160**	**8.5**	**104**	**5.5**

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

Ethnicity	High -grade cytology	Without follow-up by 90 days		Without follow-up by 180 days	
	N	N	%	N	%
Māori	307	40	13.0	27	8.8
Pacific	96	19	19.8	12	12.5
Asian	173	15	8.7	8	4.6
European/ Other	1,306	86	6.6	57	4.4
Total	**1,882**	**160**	**8.5**	**104**	**5.5**

Figure 77 – Trends in the proportion of women with high -grade cytology who have follow-up within 90 days recorded on the NCSP Register, by DHB

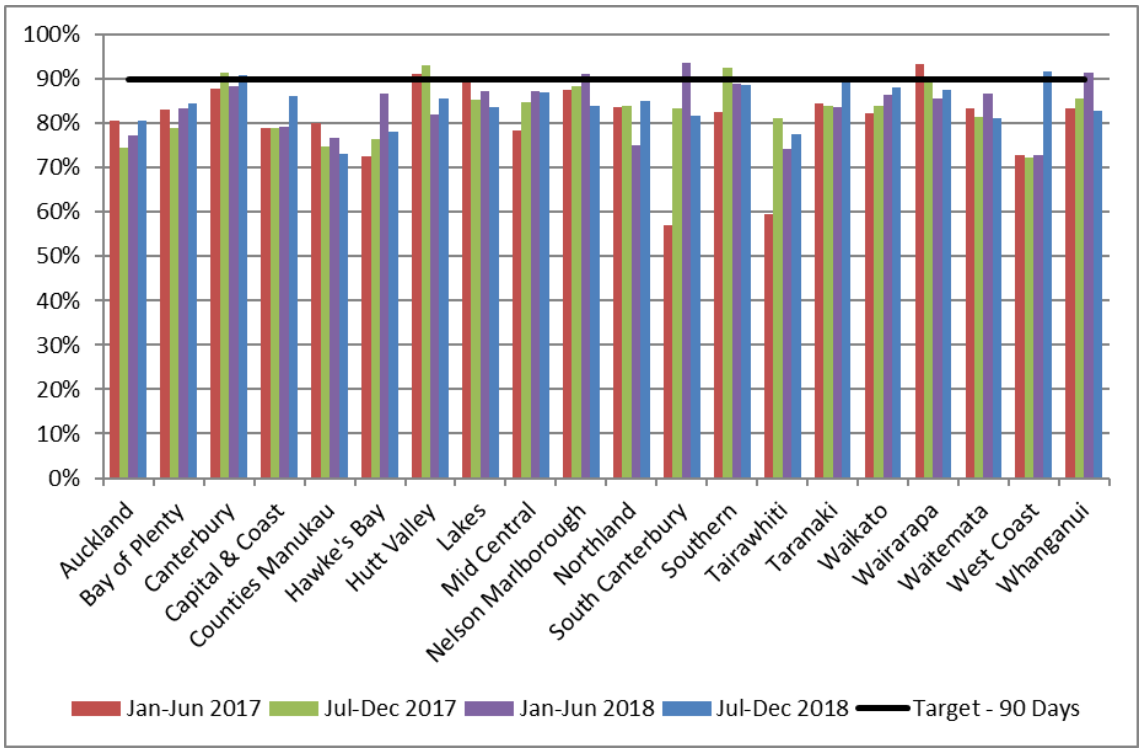


Figure 78 – Trends in the proportion of women with high -grade cytology who have follow-up within 180 days recorded on the NCSP Register, by DHB

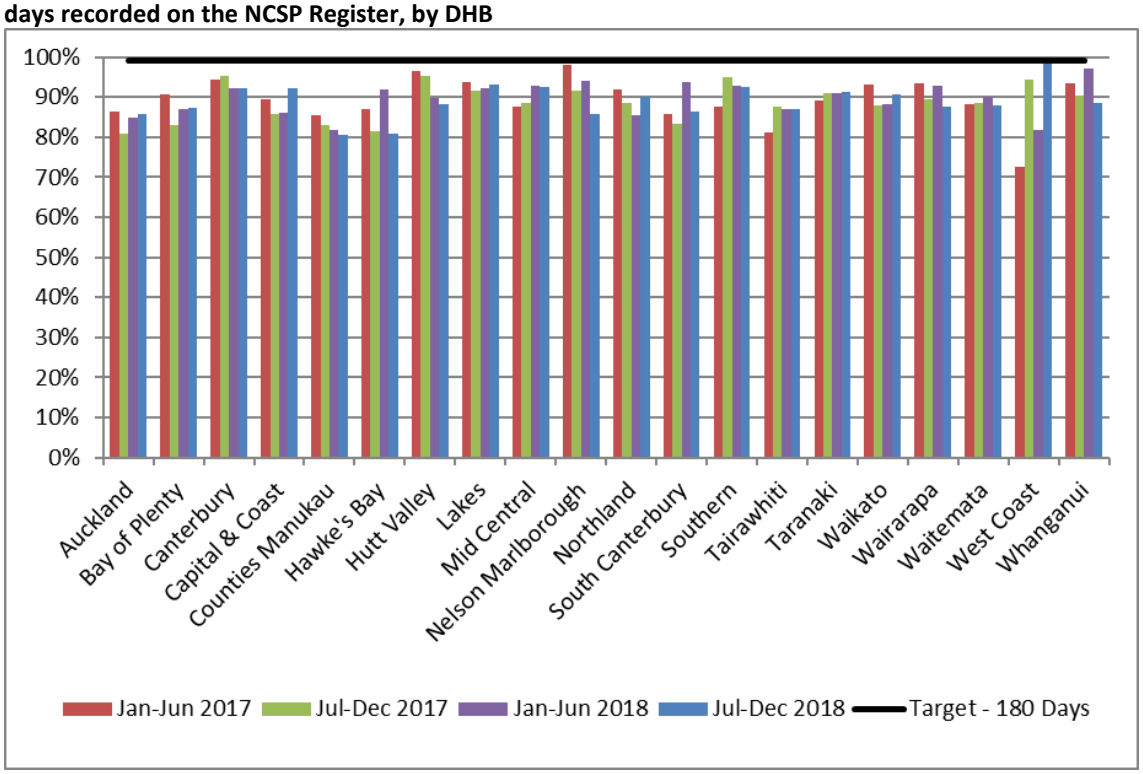


Figure 79 - Trends in the proportion of women with high -grade cytology who have follow-up within 90 days recorded on the NCSP Register, by ethnicity

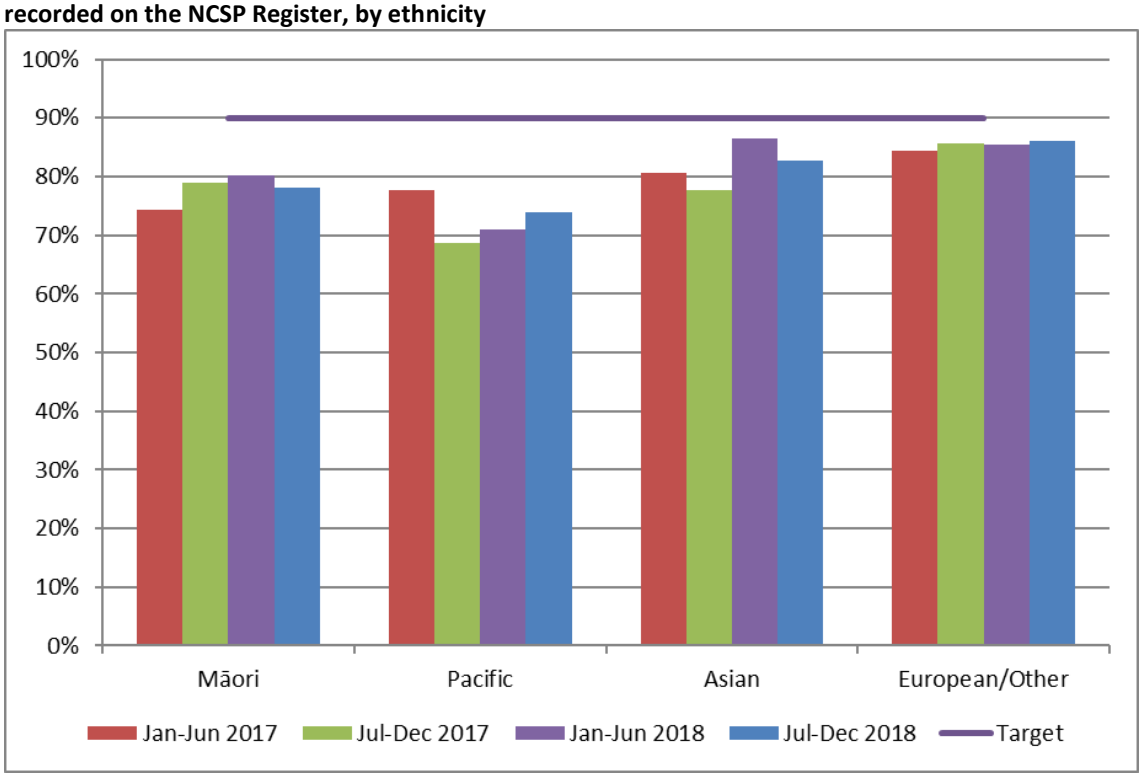
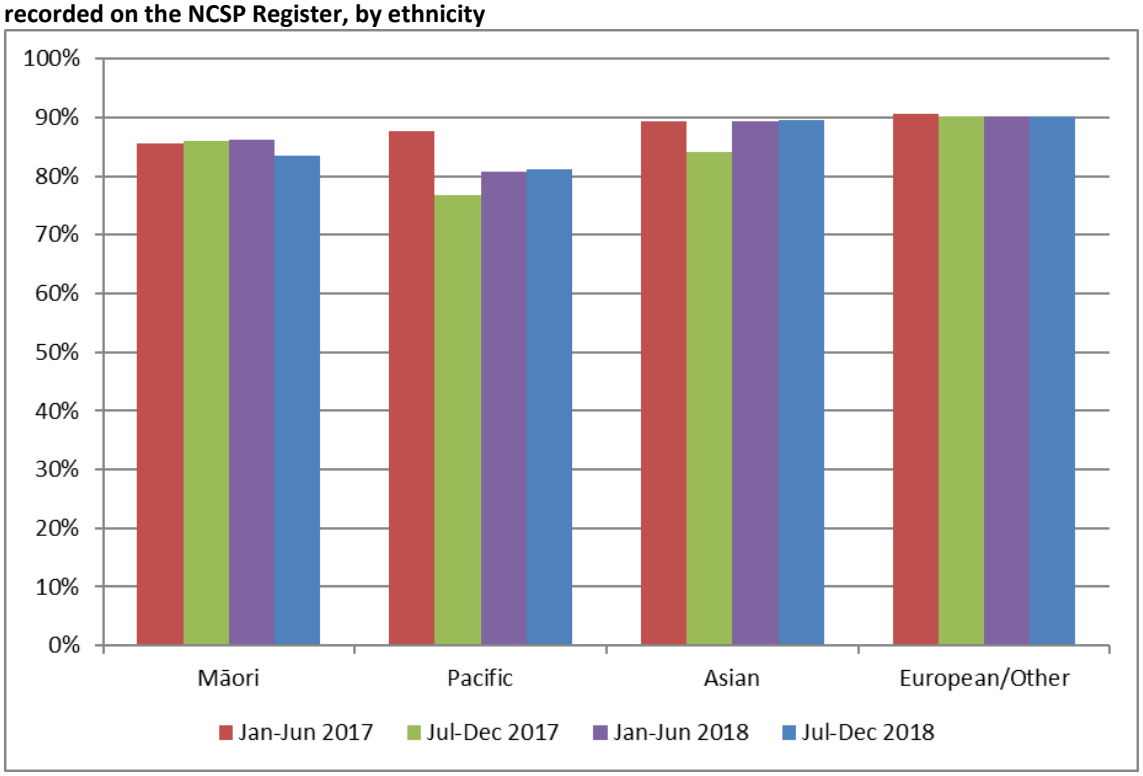


Figure 80 - Trends in the proportion of women with high -grade cytology who have follow-up within 180 days recorded on the NCSP Register, by ethnicity



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.

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.[18] 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. [19]

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. 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 January - 30 June 2018). 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 appointment 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 January - 30 June 2018, there were 1,882 women with high -grade cytology results who were not already under specialist management. This comprised 65 women who had results indicating suspicion of invasive disease, and the remaining 1,817 had other high -grade cytology results. In total, accepted referrals were found for 1,679 (89.2%) of the 1,882 women (Table 68). ***Timeliness – high -grade cytology indicating suspicion of invasive disease*** Accepted referrals for colposcopy were found for 36 (55.4%) of the 65 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 71. Of these 36 women with a referral, 29 (80.6%) have a record of a colposcopy visit on the NCSP Register within ten working days of their referral, and 34 (94.4%) have a visit within 20 working days (Table 19). Considering all 65 women with high -grade cytology indicating suspicion of invasive disease, regardless of whether or not a referral to colposcopy was recorded, a total of 59 (90.8%) have a record of a colposcopy visit prior to 31 December 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 1,643 women (90.4%) of the 1,817 women who had high -grade cytology not indicating suspicion of invasive disease. Among the women with accepted referrals, 1,257 (76.5%) were seen at colposcopy within 20 working days of their referral, and 1,493 (90.9%) were seen within 40 working days (Table 69). The proportion of women seen within 20 working days varied by ethnicity, from 55.8% (Pacific women) to 80.1% (European/ Other women; Figure 81, Table 69). This proportion also varied by DHB from 47.9% (Counties Manukau) to 95.7% (Waikato; Figure 82, Table 70). In total, 1,720 (94.7%) of the 1,817 women with high -grade cytology (but no suspicion of invasive disease) relating to a sample collected in the period 1 January - 30 June 2018 have a record of a colposcopy visit prior to 31 December 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) is lower; from 83.3% to 80.6%. 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 (94.4%) is higher than the previous report (90.0%). 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 higher than in the previous report, 76.5% in the current report compared to 75.7%. When investigating by ethnicity, there was a significant decrease in Pacific and Asian women (67.1% to 55.8% and 78.1% to 69.1% in the current monitoring period) and an increase in Māori and European/ Other women (69.9% to 71.6% and 77.3% to 80.1%; Figure 83). The proportion of all women with high -grade results for whom an accepted referral was available on the NCSP Register was lower in the current report compared to the previous report (89.2% in the current report; 90.2% 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 (March 2019 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, as in Report 49, 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 1,779 women (with or without a referral) who had a colposcopy visit by the end of the current monitoring period, there were 156 (8.8%) 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 1,882 women (65 with suspicion of invasive disease, 1,817 with other high -grade cytology) are included in both this measure and Indicator 6. In Indicator 6, it was found that 1,666 (88.5%) had histology within 180 days and 1,778 (94.5%) had a follow-up test of some sort within 180 days. While in this indicator, colposcopy and histology records indicate that 1,779 (94.5%) women had attended colposcopy prior to 31 December 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

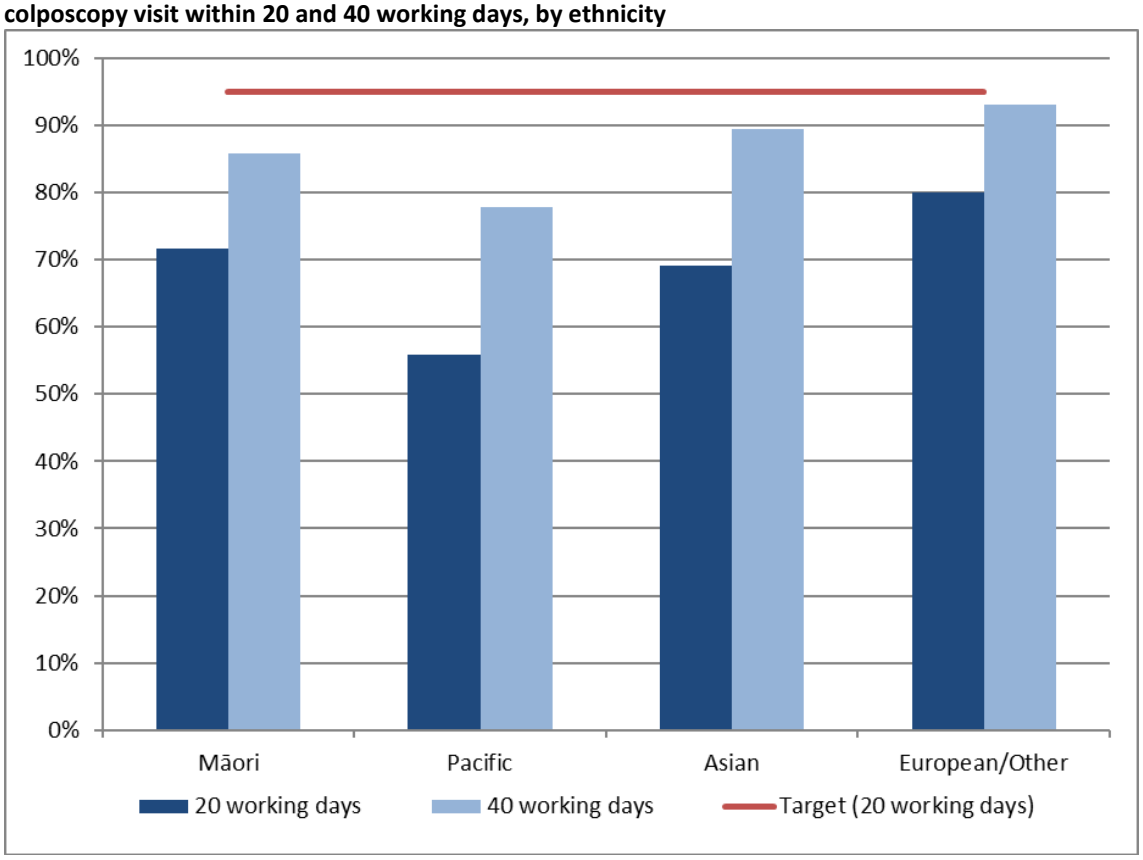
to a woman is her own DHB (or, where this information is not available on the NCSP Register, the DHB of her responsible health facility, based on the clinic's geographic location). In this indicator, women are assigned to a DHB based on either the DHB where they attended colposcopy, or the most recent 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

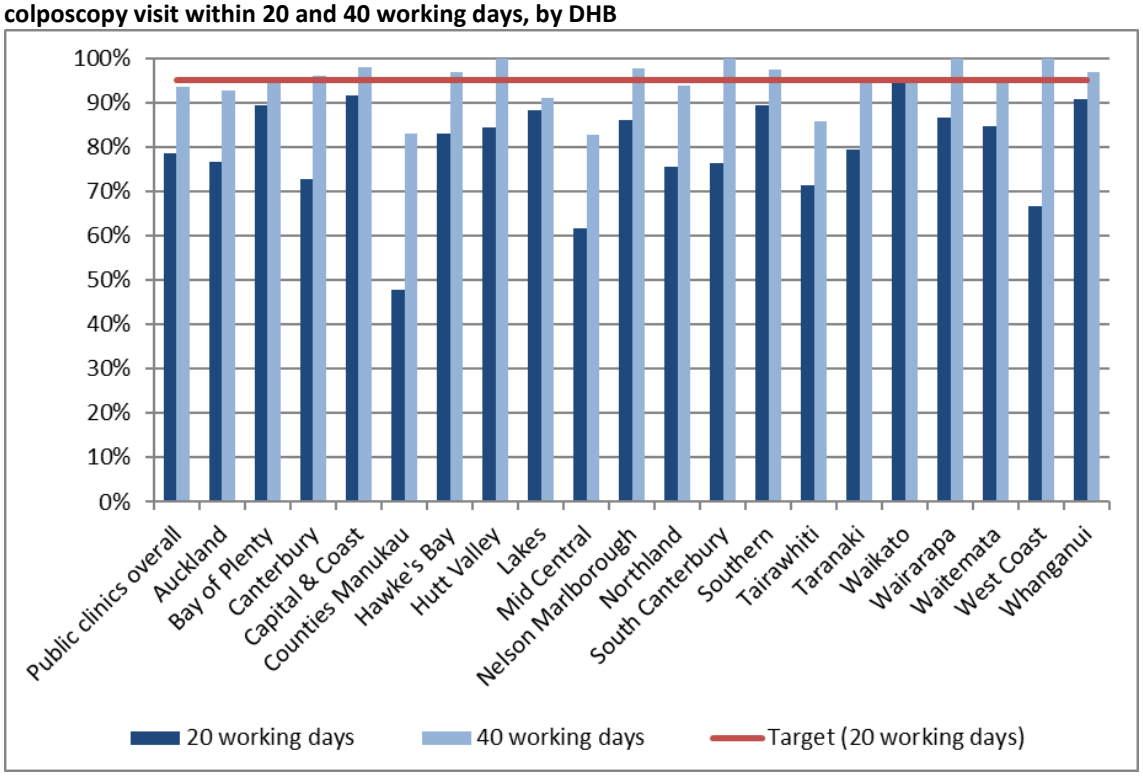
Ethnicity	HG women (suspicion of invasion)	Urgent referrals received	Women seen within:			
			10 working days		20 working days	
	N	N	N	%	N	%
Māori	10	3	2	66.7	3	100.0
Pacific	9	7	6	85.7	7	100.0
Asian	9	8	5	62.5	7	87.5
European/ Other	37	18	16	88.9	17	94.4
Total	**65**	**36**	**29**	**80.6**	**34**	**94.4**

Figure 81 - 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



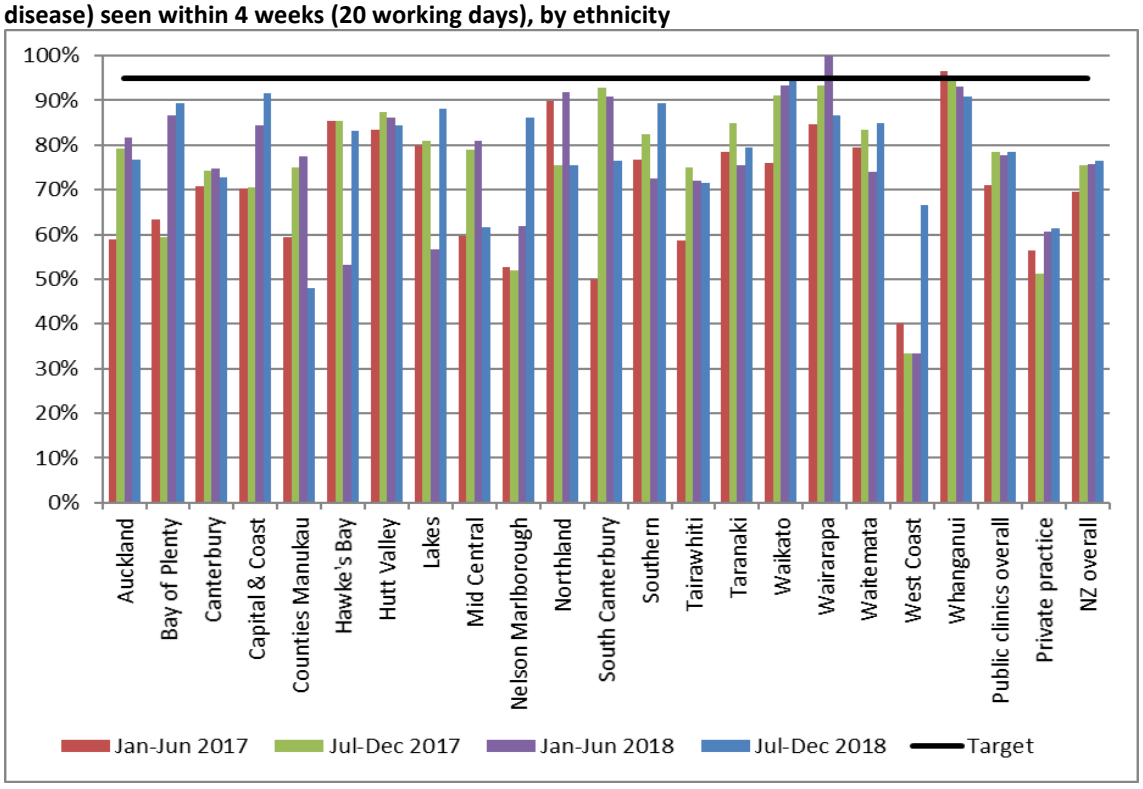
95% target relates to colposcopy visits within 20 working days.

Figure 82 - 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 83 – 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 July – 31 December 2017for 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 31 December 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.

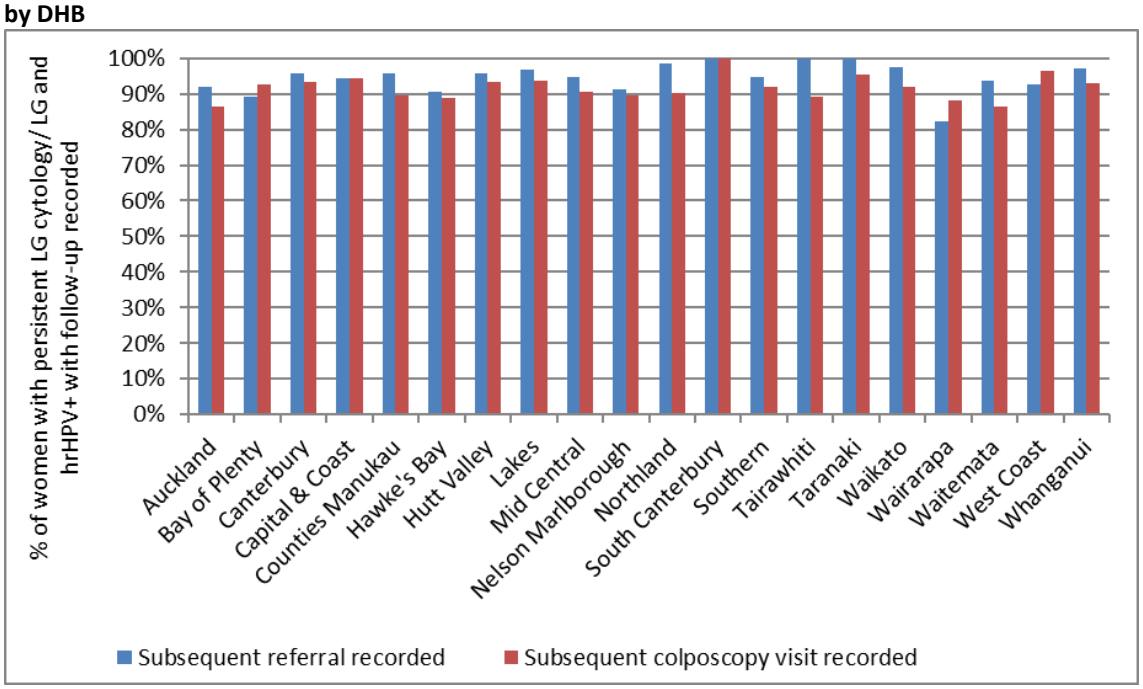
For women who neither attended colposcopy nor had an accepted referral with any DHB, DHB is assigned on the basis of the geographic region of the health facility where their low-grade cytology sample was collected.

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 3,544 women with either persistent low-grade cytology or low-grade cytology and a positive hrHPV test collected in the period 1 July – 31 December 2018. Nationally, subsequent accepted referrals are recorded for 3,091 (87.2%) of these women, and subsequent colposcopy for 3,230 (91.1%). The proportion of women for whom a subsequent referral and colposcopy visit are recorded are shown by DHB in Figure 84, and by ethnicity in Figure 85. The proportion of women for whom an accepted referral was recorded on the NCSP Register ranged from 82.4% (Wairarapa) to all women (South Canterbury, Tairawhiti and Taranaki; Figure 84). 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 86.4% (Auckland) to all women (South Canterbury; Figure 84). For ethnicity, the proportion of women for whom an accepted referral was recorded on the NCSP Register ranged from 85.9% for European/ Other to 91.2% for Pacific and Māori women (Figure 85). 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 84.2 (Pacific women) to 92.3% (European/ Other women; Figure 85). 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 3,091 women with an accepted referral nationally, 2,681 (86.7%) women attended for colposcopy within 26 weeks of their accepted referral (Table 72). By DHB, the proportion of women who attended for colposcopy within 26 weeks of their accepted referral ranged from 61.4% (Hawke's Bay) to all women (West Coast; Figure 86, Table 72). By ethnicity, this figure ranged from 79.5% of Māori women attending for colposcopy within 26 weeks of their accepted referral, to 89.4% of Asian women (Figure 87, Table 73). Overall 2,888 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 81.5% of all women with persistent low-grade cytology or low-grade cytology and a positive hrHPV test, and 93.4% of women who had an accepted referral following their low-grade cytology.

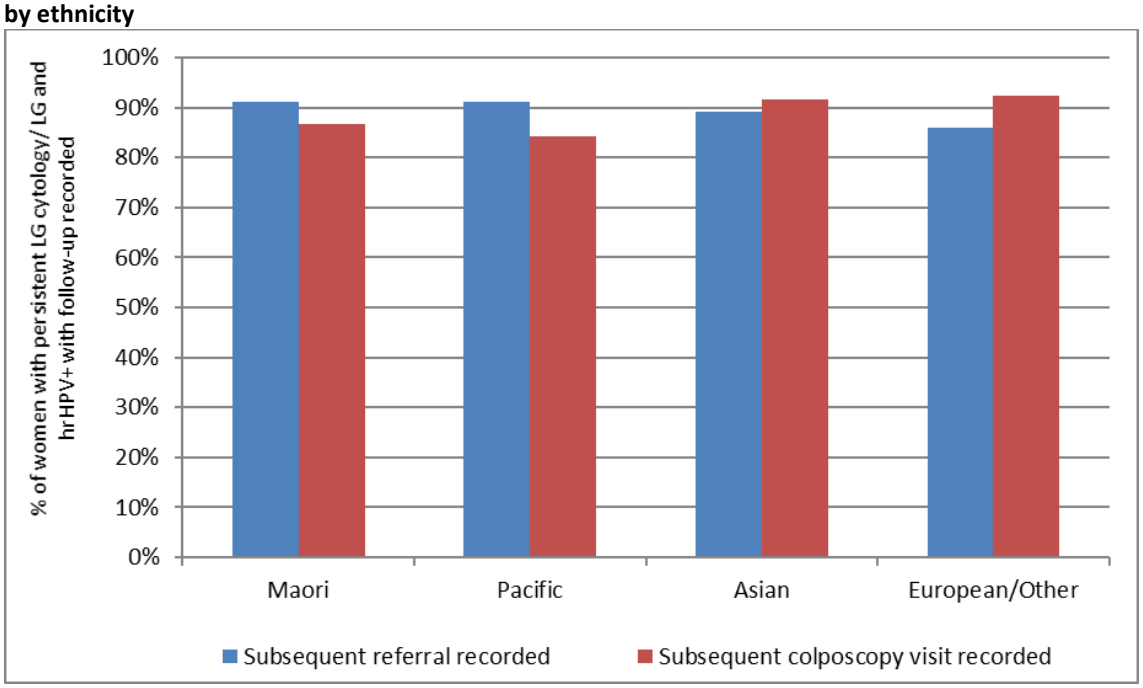
Trends	Nationally, the proportion of women with colposcopy within 26 weeks of being referred is lower (86.7% in the current report, compared to 88.8% in the previous report). This decrease has been seen in all ethnicities, except Asian (87.8% in the previous monitoring period to 89.4%; Figure 89). The proportion of women seen within 26 weeks is higher than in the previous report in ten out of twenty DHBs (Figure 88). A substantial decrease (greater than 10 percentage points) in the proportion seen within 26 weeks was observed in two DHBs (Hutt's Valley and Mid Central). 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 also seen in two DHBs (Nelson Marlborough and South Canterbury).
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 (March 2019 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 84 - 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 85 - 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 86 - 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

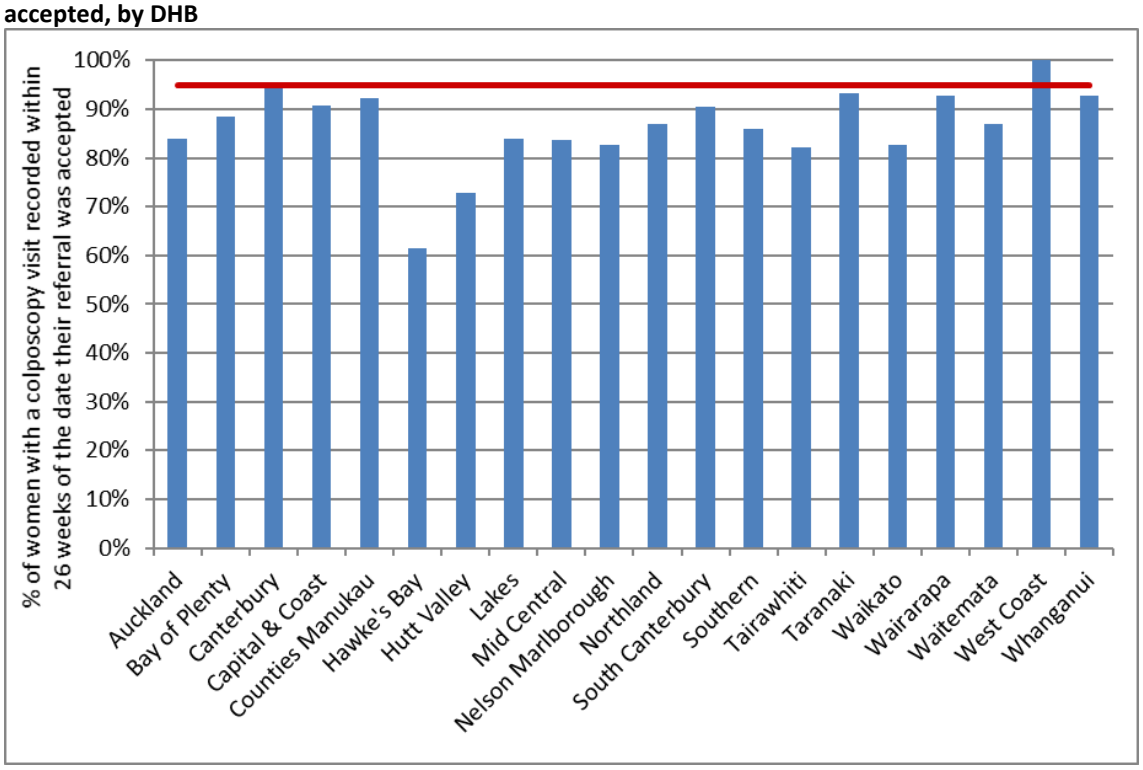


Figure 87 - Women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy: percentage with a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by ethnicity

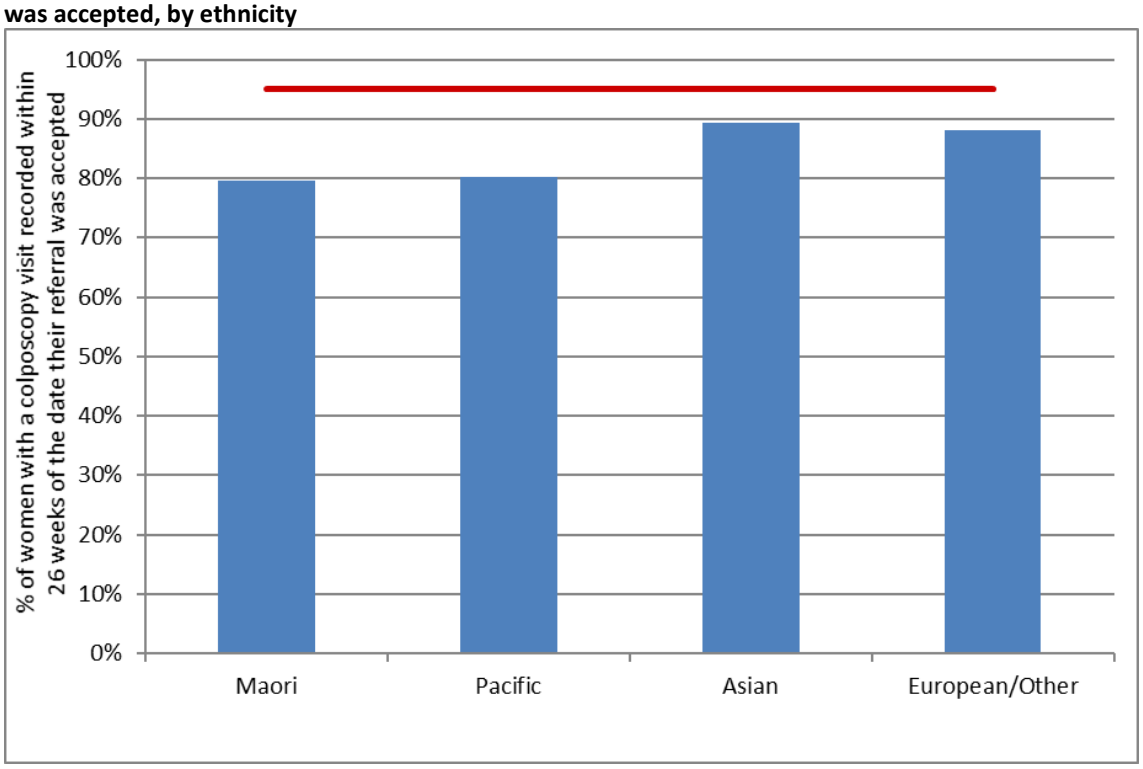


Figure 88 - Trends in the proportion of women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy who have a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by DHB

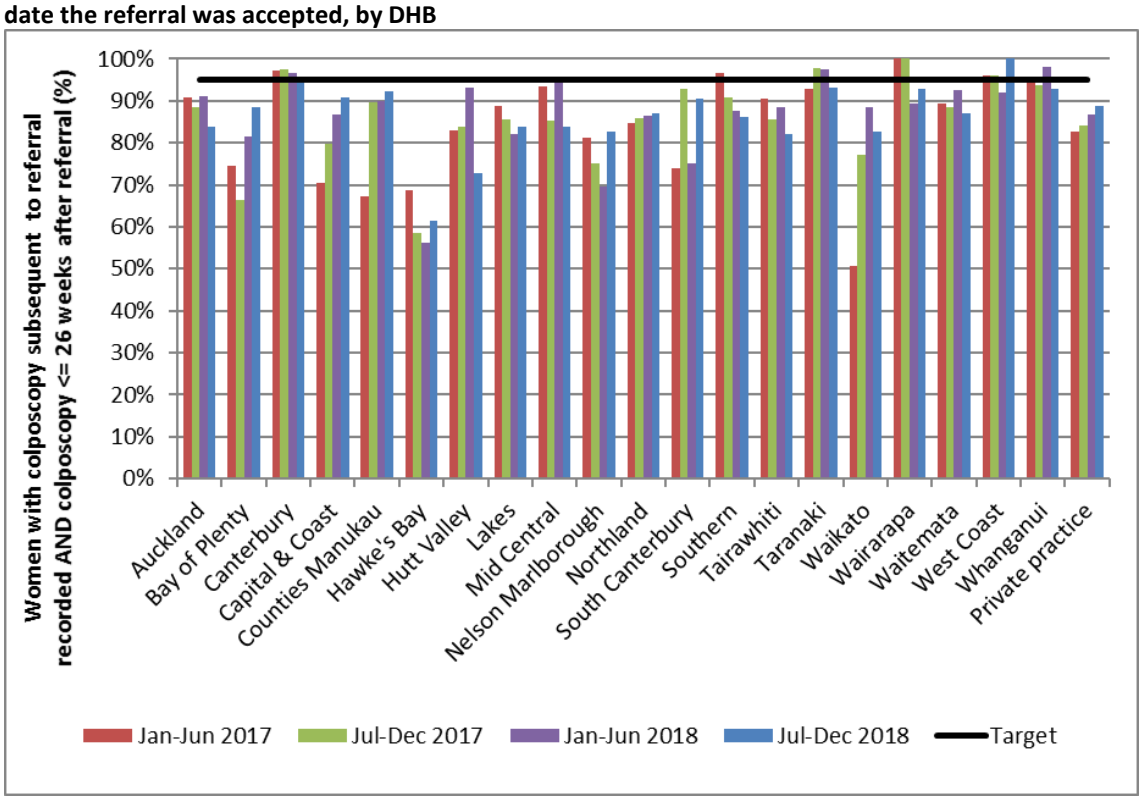
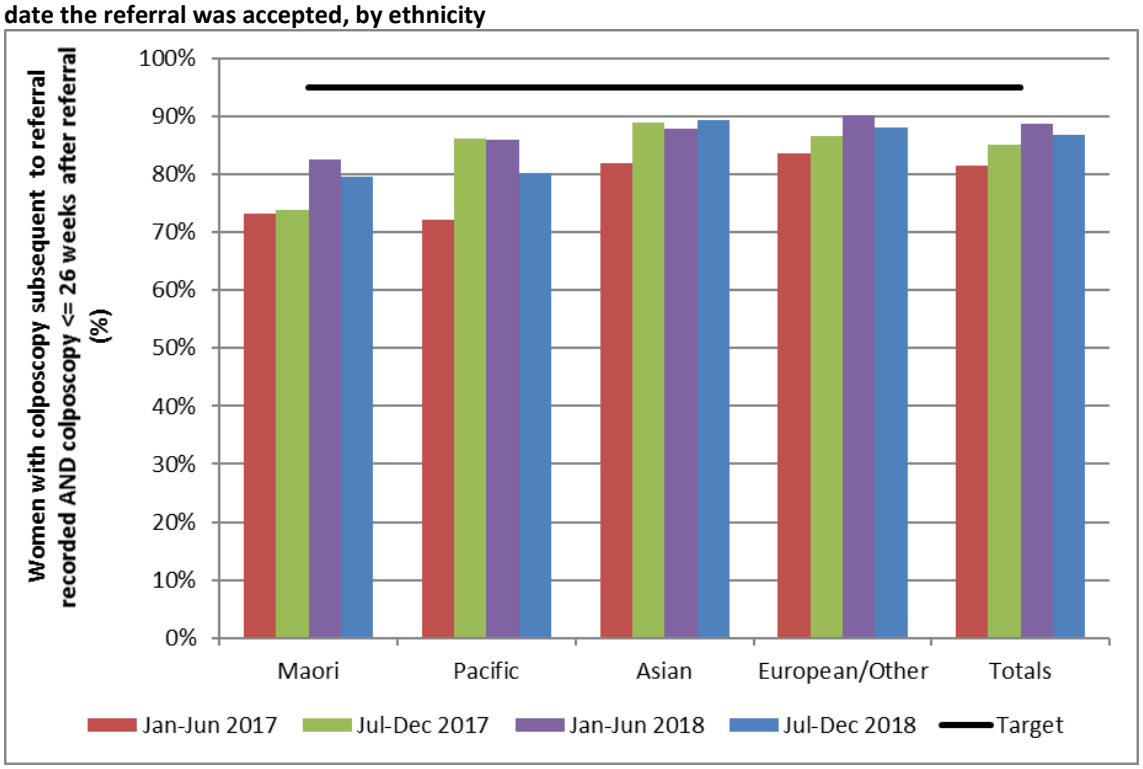


Figure 89 - Trends in proportion of women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy who have a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by ethnicity



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 11,670 colposcopy visits within the current monitoring period recorded on the NCSP Register. Documentation relating to these visits was analysed (Table 74).

Nationally, the visibility of the squamo-columnar junction was documented for 97.1% of visits; the presence or absence of a lesion was documented for all visits; and an opinion regarding the lesion grade was documented for 91.7% of visits where the presence of a lesion could not be ruled out. Additionally, the type of follow-up was documented for 94.1% of visits and the timeframe for follow-up was documented for 93.4% 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 92.5% of visits.

The colposcopic appearance was reported to be abnormal in 54.6% of colposcopies, and inconclusive in 4.9% of colposcopies (Table 75). Biopsies were taken at 92.3% of colposcopies when the colposcopic appearance was abnormal; 33.4% of colposcopies where the colposcopic appearance was reported as inconclusive, and 21.4% of colposcopies where colposcopic appearance was reported as normal (Table 76).

Documentation varied by DHB, as shown in Figure 90 and Table 74. Documentation of visibility of the squamo-columnar junction ranged from 93.9% (South Canterbury) to 99.1% 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 85.1% (Taranaki) to 95.6% (Waikato). Recording of the recommended type of follow-up ranged from 76.7% (Waikato) to all cases (Counties Manukau and West Coast) and recording of the recommended timeframe for follow-up ranged from 75.2% (Waikato) to all women (West Coast). 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 87.9% (South Canterbury) to 95.6% (Waikato; Figure 91, Table 74).

Abnormal colposcopic appearance ranged from 40.1% of colposcopies (Capital & Coast) to 72.4% of colposcopies (Wairarapa). Inconclusive colposcopic appearance ranged from 2.5% of colposcopies (Waikato) to 8.4% of colposcopies (Tairawhiti; Table 75). The proportion of colposcopies where a biopsy was taken also varied by DHB. This proportion ranged from 83.7% of visits in South Canterbury, up to 98.6% (Whanganui) when the colposcopic appearance was abnormal, and from 12.1% (Counties Manukau) up to 33.3% (Wairarapa) when the colposcopic appearance was normal (Table 76).

	Colposcopies performed in private practice accounted for 12.1% 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 74). Documentation completion rate was similar in private and public clinics overall for the proportion of colposcopies documenting visibility of the squamo-columnar junction (97.0% for private practice and 97.2% for public clinics overall) and for documenting the presence or absence of a lesion (100.0% in both private and public clinics). Documentation completion rate was slightly higher in public clinics overall than for private clinics overall for lesion grade (91.8% for public clinics; 91.3% for private practice). The proportion completed was similar in public and private clinics overall for documenting follow-up timeframe (93.3% public clinics; 93.9% for private practice) and somewhat higher in private clinics overall for follow-up type (93.8% for public clinics and 96.6% for private practice). 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 slightly higher in public clinics than in private clinics overall (92.6% for public clinics overall; 92.3% 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 97.1% of colposcopies, compared with between 96.9% and 97.3% 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 91.7% of visits where the presence of a lesion could not be ruled out, compared with between 91.5% and 91.6% for the previous three monitoring periods. Recording of recommended follow-up type was documented for 94.1% of visits in the current period, which is lower than the range seen for the previous three periods (95.1% - 95.6%). This was also the case for recommended timeframe for follow-up, which was recorded for 93.4% of visits in the current period compared with 94.3% - 94.9% in the previous three periods.Trends in the completion of all required fields by DHB are shown in Figure 91. In total 60.7% of colposcopies had an associated biopsy compared to 59.2% in the previous report. Of these, biopsies were taken in 92.3% of colposcopies with an abnormal appearance in this report and 92.0% in the previous report. 21.4% of colposcopies with a normal appearance also had documentation of a biopsy taken in this period and 19.2% in the previous reporting periods. Trends in the number of colposcopies recorded on the NCSP Register by DHB are shown in Figure 92 The number of colposcopies decreased in the current monitoring period in twelve of the twenty DHBs with an overall decrease in the number of colposcopies of 4.3%.
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 90 - Completion of colposcopic assessment fields, by DHB

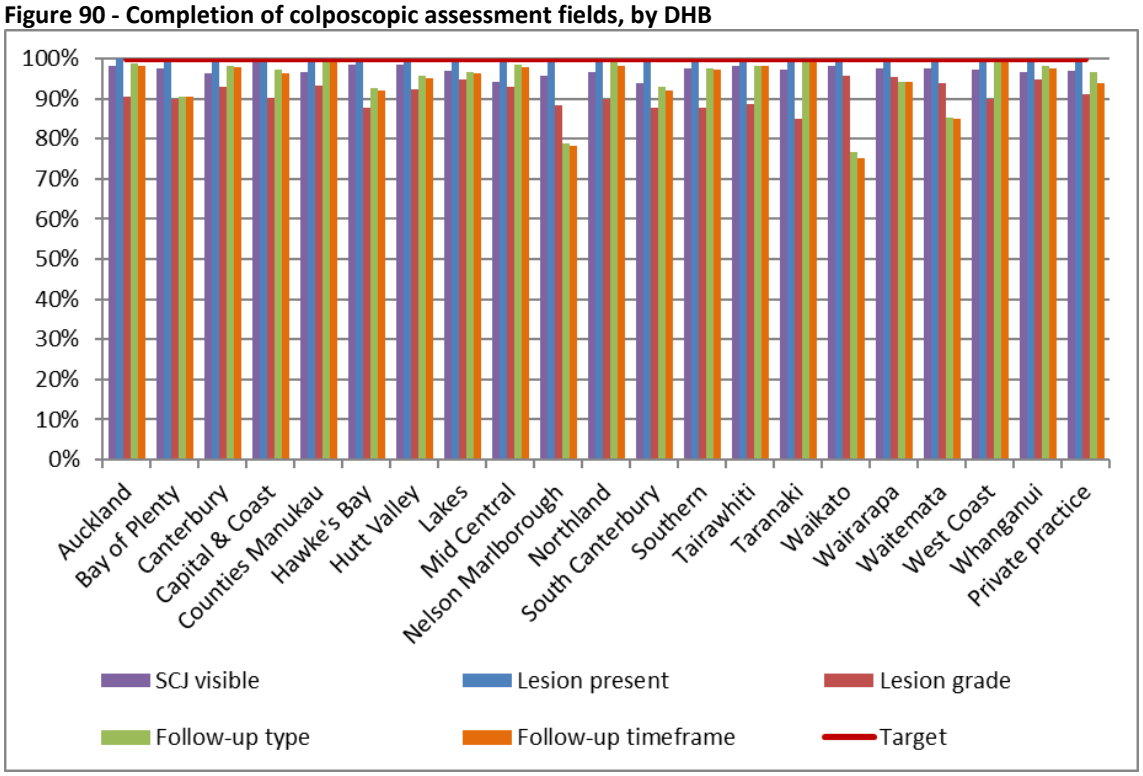


Figure 91 - Trends in the completion of all required colposcopic assessment fields, by DHB

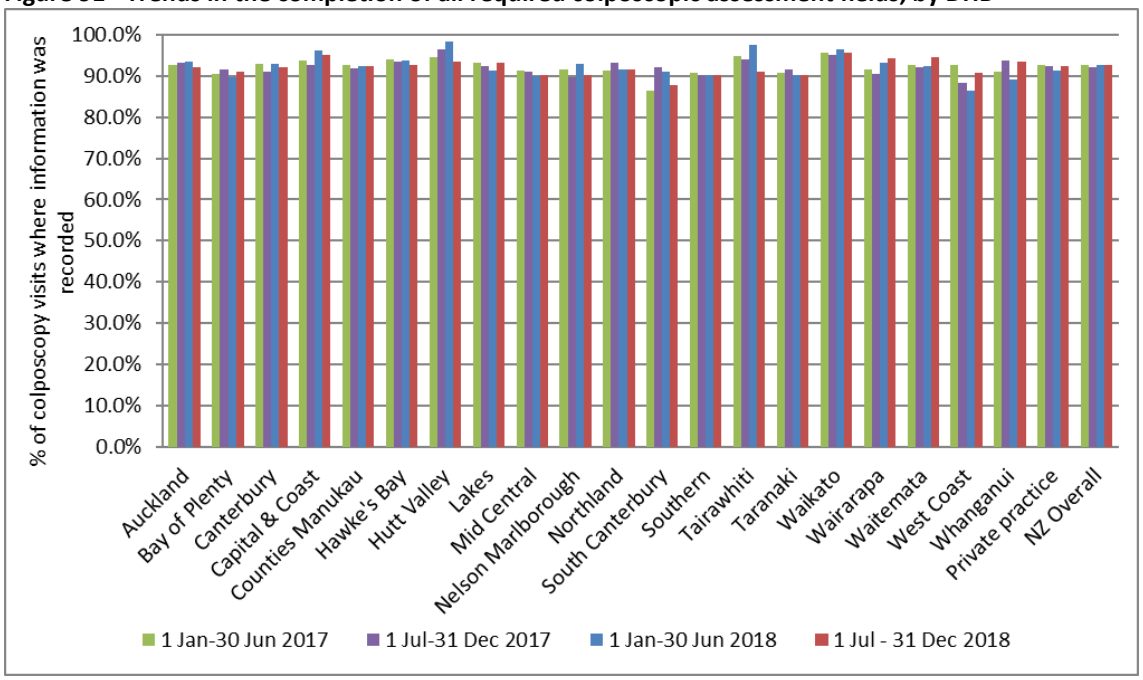
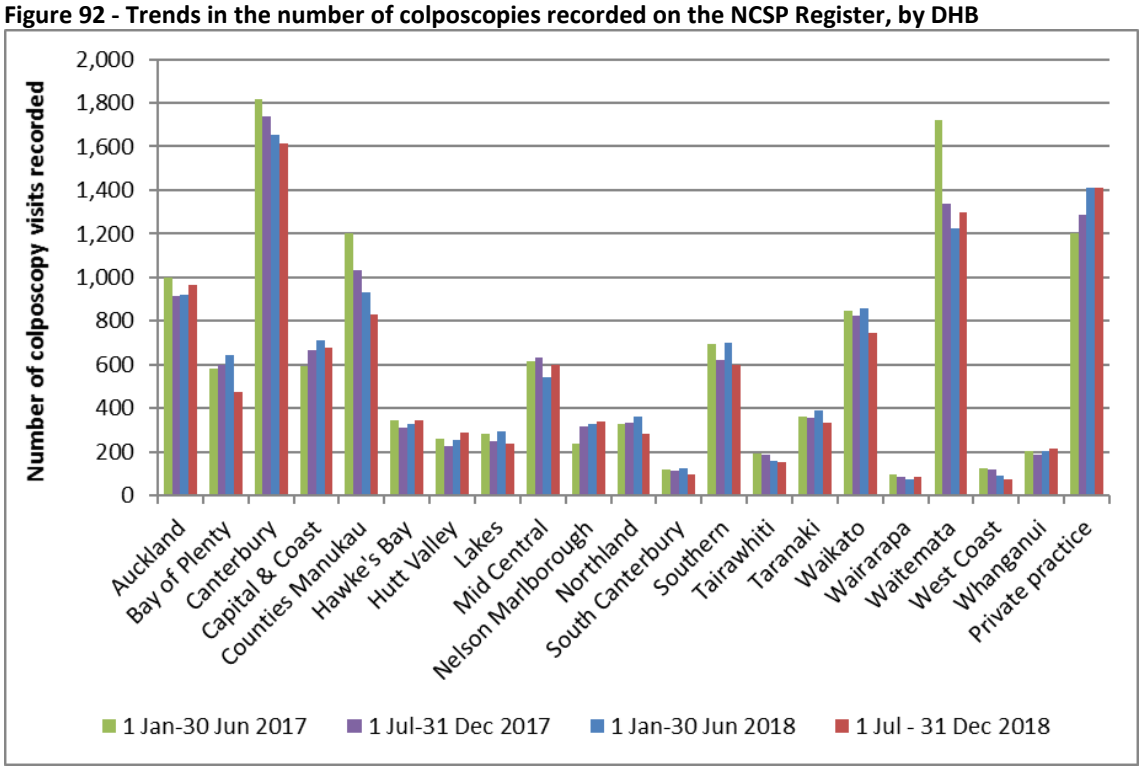


Figure 92 - Trends in the number of colposcopies recorded on the NCSP Register, by DHB



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 January - 30 June 2018). 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

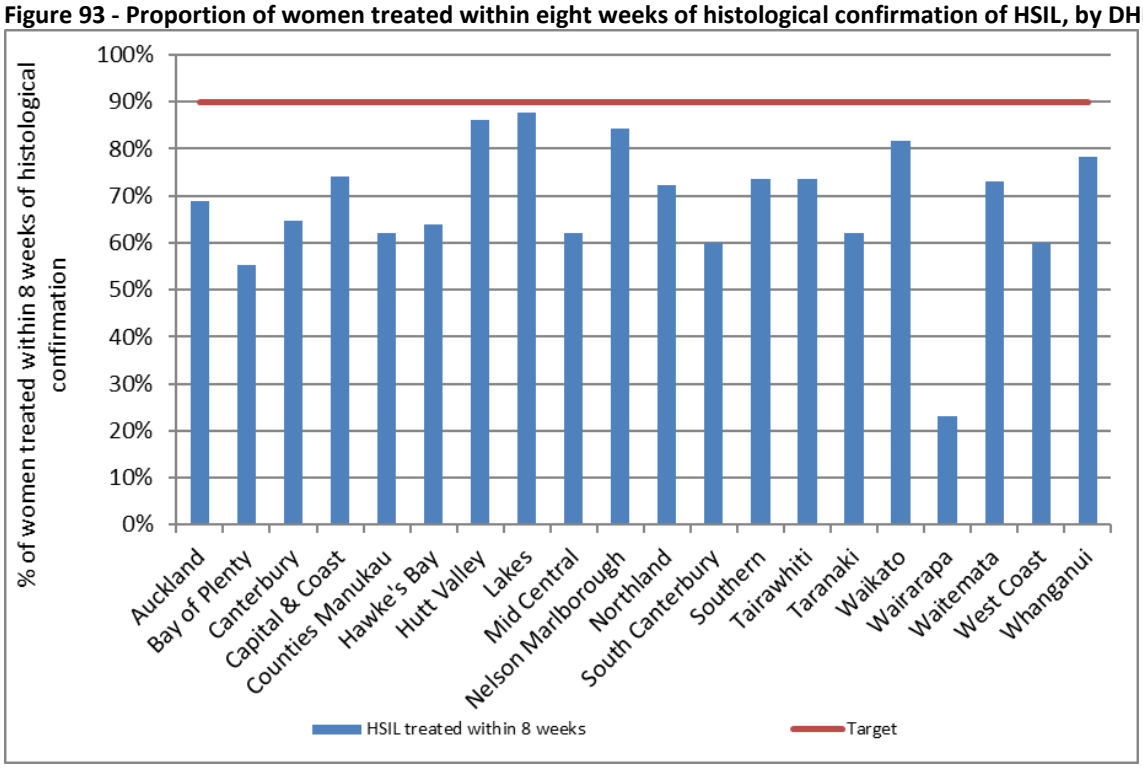
90% or more of women with HSIL are treated within 8 weeks of histological confirmation of CIN 2/3.

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 2,108 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 31 December 2018). Of these women, 1,397 women (66.3%) were treated within eight weeks of HSIL being histologically confirmed. The proportion of women treated within eight weeks varied widely by DHB, from 23.1% (Wairarapa) to 87.8% of women (Lakes). No DHBs met the target of at least 90% of women treated within eight weeks of histological confirmation of HSIL (Figure 93, Table 20). There were 1,844 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 31 December 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*[20], 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 1,844 women with histological LSIL. Of these women, 96 (5.2%) 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 40.0% (Northland; Table 20). The DHB where the largest number of women were treated was Canterbury (23 women).
Trends	Nationally, the proportion of women with histological HSIL who were treated within eight weeks of histological confirmation is is higher than in the previous monitoring report (66.3% in the current report; 63.8% in the previous monitoring period). The proportion of women with histological HSIL who were treated within eight weeks for the current report period increased in thirteen of the twenty DHBs when compared with the previous report period (Figure 94). The proportion of women with histological LSIL who were subsequently treated (within 26 weeks of LSIL being histologically confirmed) is lower, from 6.5% for the previous report to 5.2% 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. 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 HISL.

Figure 93 - 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 94 - Trends in the proportion of women treated within eight weeks of histological confirmation of HSIL, by DHB

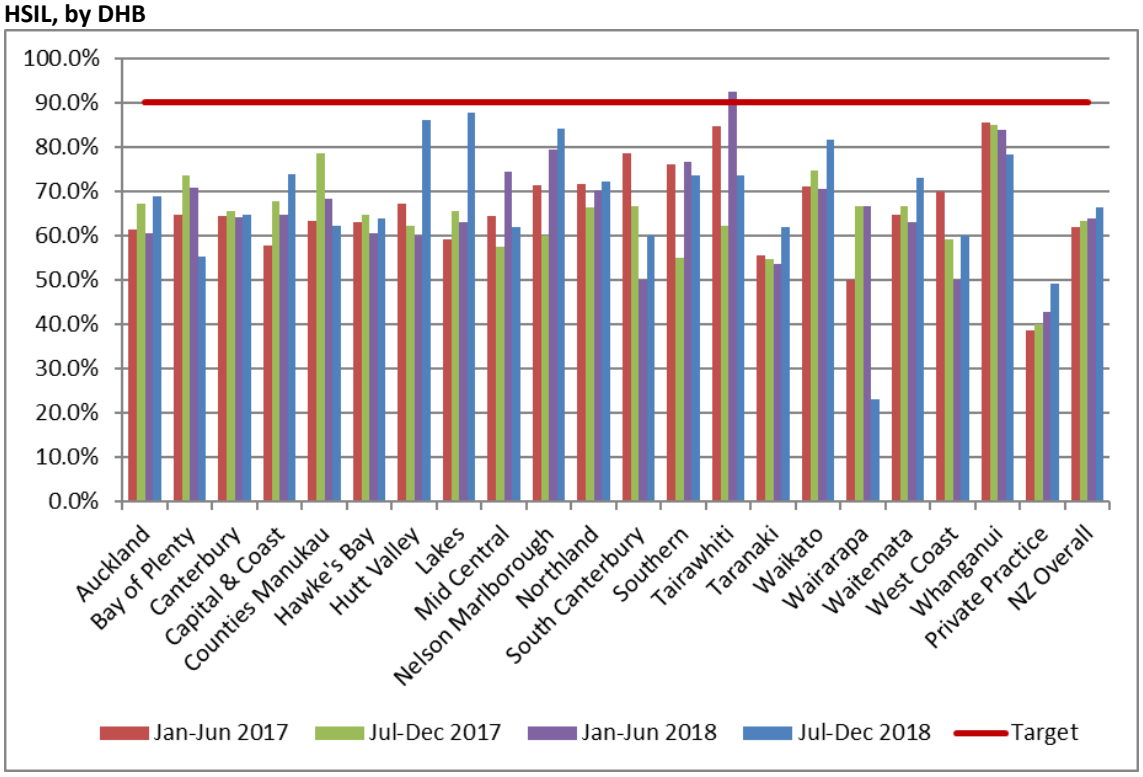


Table 20 - Timeliness and appropriateness of treatment, by DHB

DHB	Women with CIN 2/3	Treated within 8 weeks		Women with histological LSIL*	Women subsequently treated†	
	N	N	%	N	N	%
Public clinics (overall)	*1,788*	*1,240*	*69.4*	*1,444*	*82*	*5.7*
Auckland	141	97	68.8	130	8	6.2
Bay of Plenty	103	57	55.3	99	5	5.1
Canterbury	261	169	64.8	444	23	5.2
Capital & Coast	96	71	74.0	68	6	8.8
Counties Manukau	166	103	62.0	222	14	6.3
Hawke's Bay	61	39	63.9	16	1	6.3
Hutt Valley	43	37	86.0	23	-	-
Lakes	49	43	87.8	42	5	11.9
Mid Central	100	62	62.0	31	3	9.7
Nelson Marlborough	57	48	84.2	23	2	8.7
Northland	61	44	72.1	5	2	40.0
South Canterbury	25	15	60.0	8	-	-
Southern	140	103	73.6	54	1	1.9
Tairawhiti	34	25	73.5	8	-	-
Taranaki	79	49	62.0	30	4	13.3
Waikato	147	120	81.6	78	4	5.1
Wairarapa	13	3	23.1	4	-	-
Waitemata	160	117	73.1	106	2	1.9
West Coast	15	9	60.0	33	1	3.0
Whanganui	37	29	78.4	20	1	5.0
Private Practice	*320*	*157*	*49.1*	*400*	*14*	*3.5*
Total	**2,108**	**1,397**	**66.3**	**1,844**	**96**	**5.2**

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 July - 31 December 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, for the purposes of this measure 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 1,341 women treated for CIN 2 or CIN 3 lesions in the six-month period from 1 July - 31 December 2017. These women were followed up for 12 months from the date of their treatment visit.

Follow-up post treatment

There were 1,017 women (75.8%) with a follow-up colposcopy, and 1,006 women (75.0%) with both a follow-up colposcopy and a cytology sample in the nine month period after their treatment visit.

Figure 95 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 78). The number of women with colposcopy only and no record of a cytology sample in the timeframe was at most four in Canterbury.

Nationally, the percentage of women treated for high -grade lesions with a record of colposcopy and cytology within the nine-month period post-treatment (75.0%) is below the target value of 90%.

Three DHBs met the target of at least 90% of women receiving cytology and colposcopy within nine months post-treatment (Figure 95, Table 78). 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 27.3% (West Coast) to 95.2% of women (Auckland).

Women discharged appropriately

In total, 1,015 women (75.7% of those treated) were eligible to be discharged by 12 months after their treatment visit, and 873 of these women (86.0%) were discharged within 12 months of treatment (Table 77). Figure 96 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 (Nelson Marlborough, Tairawhiti, Wairarapa; Table 77). In some cases, the number of women eligible for discharge was small, so these results should be interpreted with caution (ten or fewer women in Wairarapa, West Coast and South Canterbury).

Nine DHBs met the target of discharging 90% of women where appropriate within 12 months (Capital & Coast, Counties Manukau, Hutt Valley, Mid Central, Nelson Marlborough, Tairawhiti, Waikato, Wairarapa 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), 1,009 women were discharged within 12 months of being treated for a high -grade lesion (75.2% of all women treated for a high -grade lesion).

Trends	The proportion of women with follow-up is similar or lower than the last report (77.5% for colposcopy in both reports; decrease from 76.4% to 75.0% in the current monitoring period for follow-up with both cytology and colposcopy). Three DHBs met the target of 90% of women having colposcopy and cytology within nine months of treatment, compared to one DHB in the previous report. The proportion of women discharged appropriately to their sample taker by 12 months has slightly decreased (86.1% in the previous report; 86.0% in the current report). The number of DHBs meeting the target of 90% increased from eight to nine.
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 March 2019. 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 95 - Percentage of women treated with colposcopy, and both colposcopy and cytology, within nine months post-treatment, by DHB

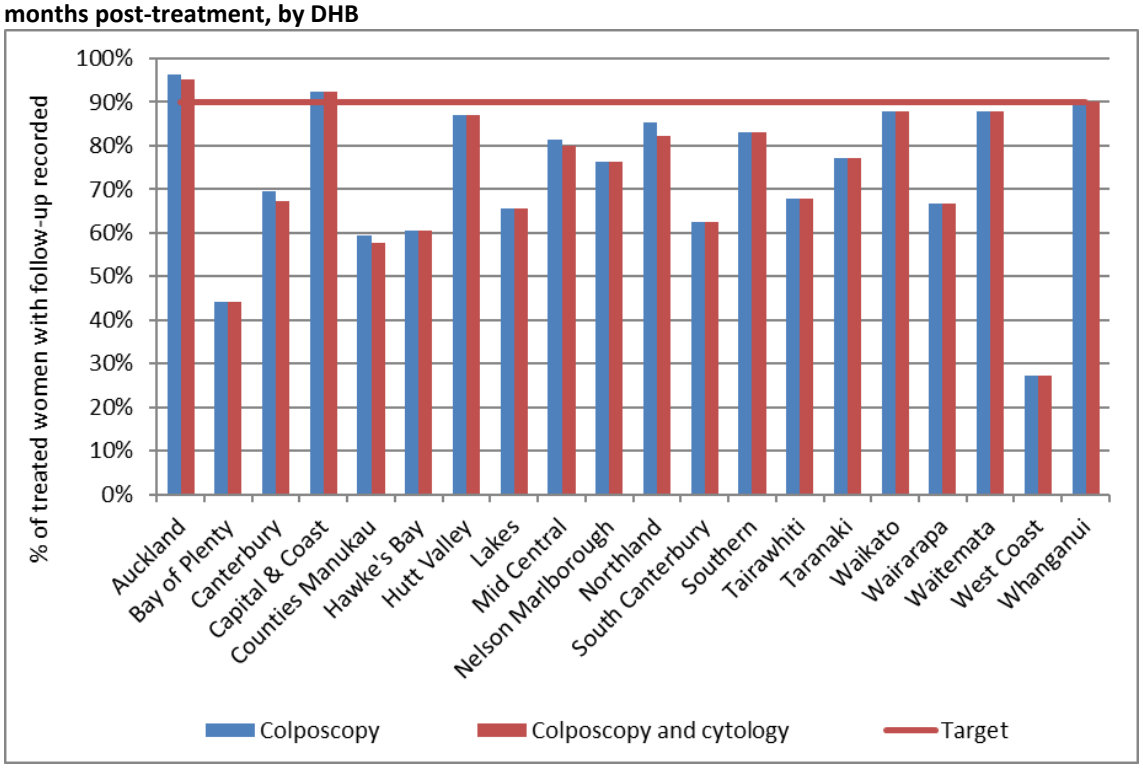
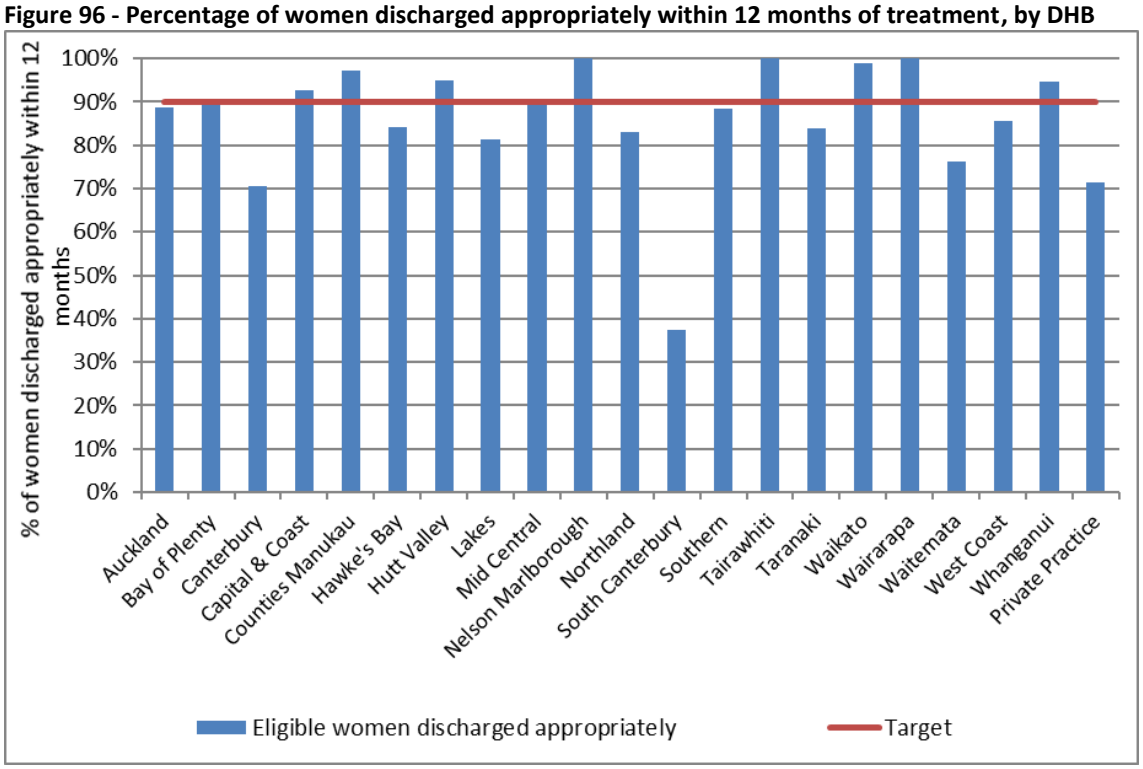


Figure 96 - Percentage of women discharged appropriately within 12 months of treatment, by DHB



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 780 women aged less than 30 years and 1,684 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 2,165 women aged less than 30 years and 1,630 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, 96.6% of women aged 30 years or more with an ASC-US cytology result, and 95.6% of women aged 30 years or more with an LSIL cytology result are recorded as having a subsequent HPV test (Table 79, Table 80). These proportions ranged from 91.1% (Medlab Central Ltd) to 98.6 (Canterbury Health Laboratories) for ASC-US cytology results and from 90.5% (Medlab Central Ltd) to 98.9% (Anatomical Pathology Services) for LSIL cytology results (Figure 97, Table 79, Table 80).

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 0.8% (6 women) of women aged less than 30 years with ASC-US results, and 0.7% (15 women) of women aged less than 30 years with LSIL results. These proportions ranged from no women (LabPLUS, Canterbury Health Laboratories, Medlab Central Ltd and Pathlab) to 2.2% (Southern Community Labs) for women with ASC-US results, and from no women (Canterbury Health Laboratories) to 1.0% (LabPLUS and Southern Community Labs) for women with LSIL results (Table 79, Table 80).

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 24.0% for women with ASC-US results, and 59.1% for women with LSIL results. These proportions varied by laboratory from 14.3% (Canterbury Health Laboratories) to 35.8% (Southern Community Labs) for women with ASC-US cytology (Figure 98), and from 50.0% (Medlab Central Ltd to 63.6% (Canterbury Health Laboratories) for women with LSIL cytology (Figure 99).

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 (31.2%), and 30-39 yrs for those with LSIL cytology (65.4%). 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 19.4% and 22.3% (Figure 100, Table 21). For women with LSIL results, the positivity rates were between 43.9% and 58.2% for these 10-year age groups (Figure 100, 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 July –31 December 2017. In this period, there were 341 women with an ASC-US cytology result and positive HPV triage test, and 887 who had an LSIL cytology result and positive HPV triage test. 317 (93.0%) of the women with ASC-US who were triage-positive and 823 (92.8%) 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, 210 (66.2%) and 591 (71.8%) 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 21.4% for HPV triage-positive ASC-US and 19.6% for HPV triage-positive LSIL (Table 81, Table 82). These percentages varied by laboratory from 14.0% (Anatomical Pathology Services) to 46.7% (Canterbury Health Laboratories) for HPV triage-positive ASC-US and from 16.1% (Anatomical Pathology Services) to 26.8% (Medlab Central Ltd) for HPV triage-positive LSIL (Figure 101).

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 14.2% for HPV triage-positive ASC-US and 14.1% for HPV triage-positive LSIL (Table 81, Table 82). These percentages varied by laboratory from 10.8% (Medlab Central Ltd) to 38.9% (Canterbury Health Laboratories) for HPV triage-positive ASC-US and from 11.4% (Anatomical Pathology Services) to 19.4% (Canterbury Health Laboratories) for HPV triage-positive LSIL (Figure 102). 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 102 and Figure 103.

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 104), and as a percentage of women with colposcopy recorded (Figure 105). 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 60-69 years for ASC-US (28.6%) and 30-39 years for LSIL (23.3%).

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 lower than in the previous report for women with ASC-US results (97.3% in the previous period compared to 96.6% in the current

period), and for women with LSIL results (96.7% in the previous period compared to 95.6% 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 (1.0% in the previous period compared to 0.8% in the current period) and slightly higher than the previous period for LSIL results (0.6% in the previous period and 0.7% in the current period).

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 ASC-US (24.5% in the previous report; 24.0% in the current report), but higher for LSIL (58.5% in the previous report; 59.1% in the current report).

Histological outcomes in triage-positive women who attended colposcopy

93.0% 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 is lower than in the previous report (95.4%). For the current report, 66.2% 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 21.4% of women in the current report, compared with 23.0% 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 14.2% in the current report versus 15.3% 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 Anatomical Pathology Services; Figure 106). Caution must be taken when interpreting differences at LabPLUS due to frequently having small numbers of triage-positive women and therefore highly variable percentages).

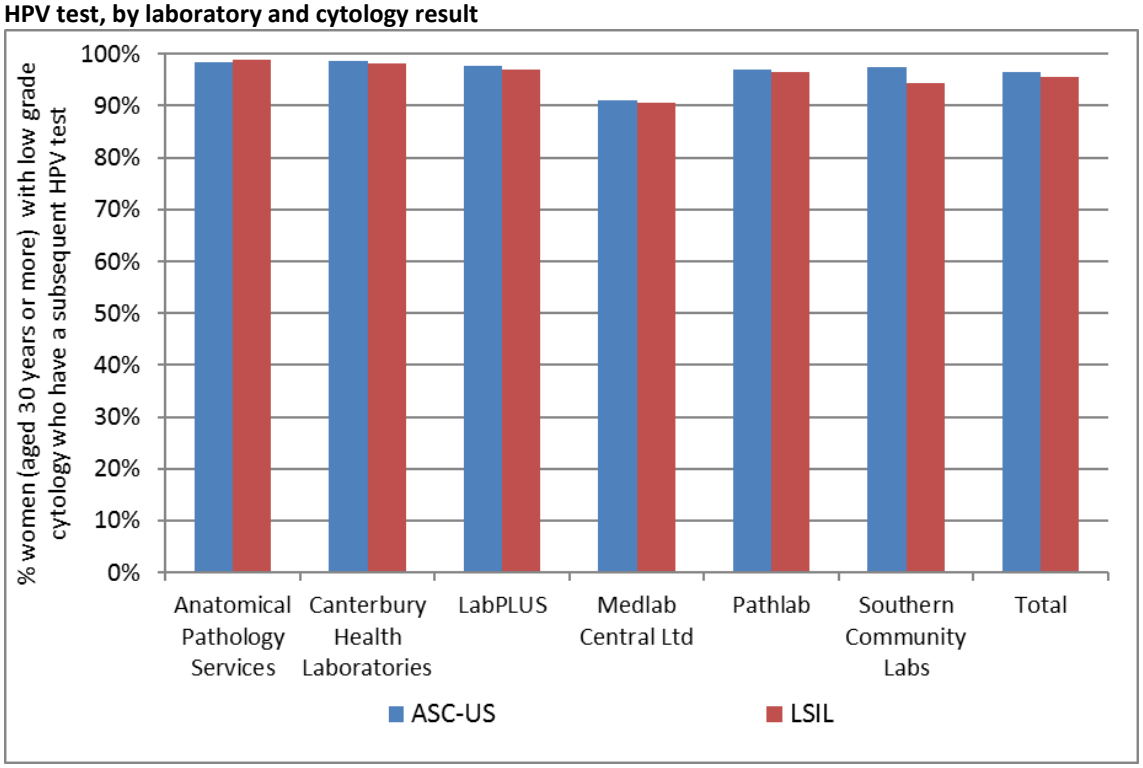
For women with LSIL cytology and a positive HPV triage test in the reference period for the current report, 92.8% had a record of colposcopy and/or histology within 12 months of their result, which is lower than the 91.5% of women in the previous report. For both the current and previous report 71.8% of these women with colposcopy also had a histology record. Of those women with a histology record, the histology result was CIN 2+ for 19.6% of women in the current report, compared with 19.3% 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 and previous reports. Trends in this proportion of LSIL triage-positive women with CIN 2+ histology (among those who attended colposcopy) are shown in Figure 107. The proportion with CIN2+ histology decreased in three laboratories (LabPLUS, Pathlab, Southern Community Labs Dunedin).

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 (21 women). This is just lower than the

number of women in the previous report (22 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.[21,22] 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 97 - 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 98 - Proportion of HPV triage tests which are positive following ASC-US cytology (women aged 30 years or more), by cytology laboratory

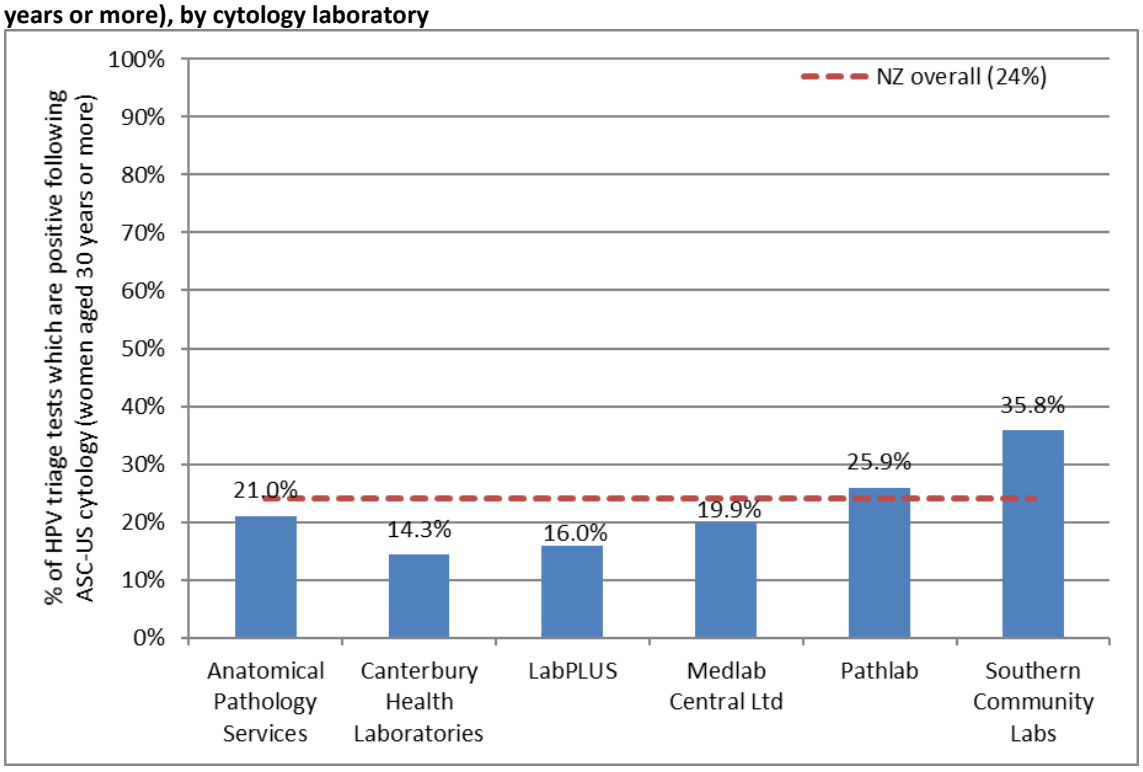


Figure 99 - Proportion of HPV triage tests which are positive following LSIL cytology (women aged 30 years or more), by cytology laboratory

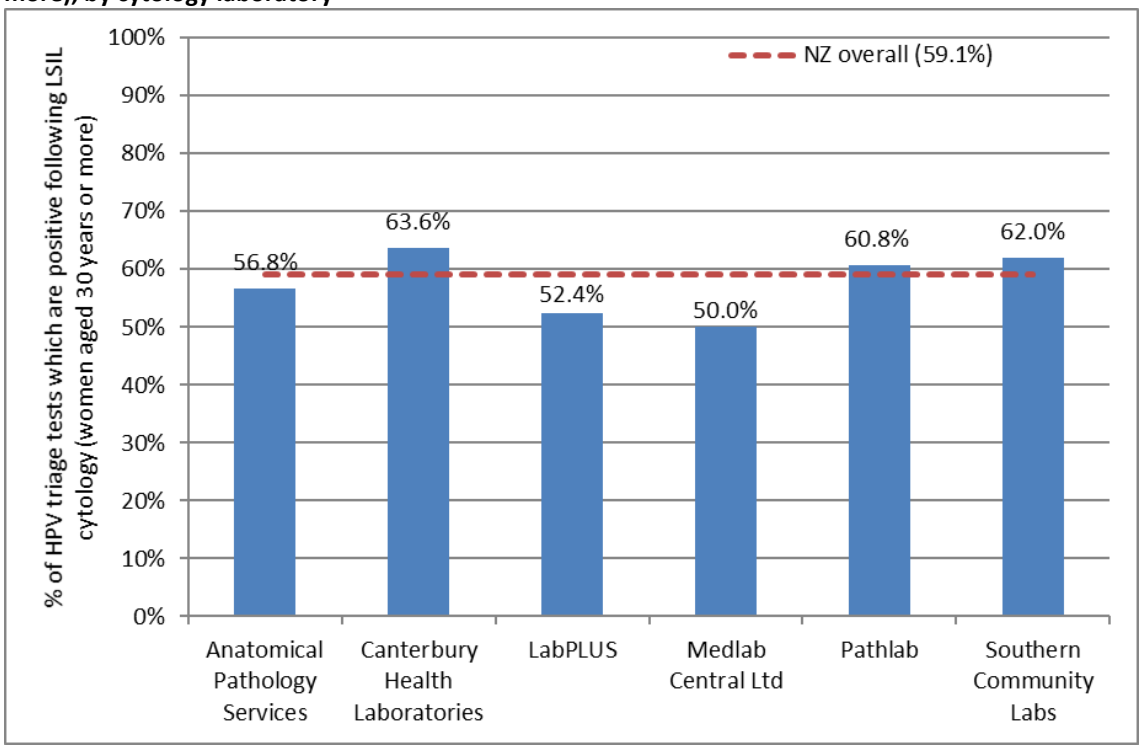
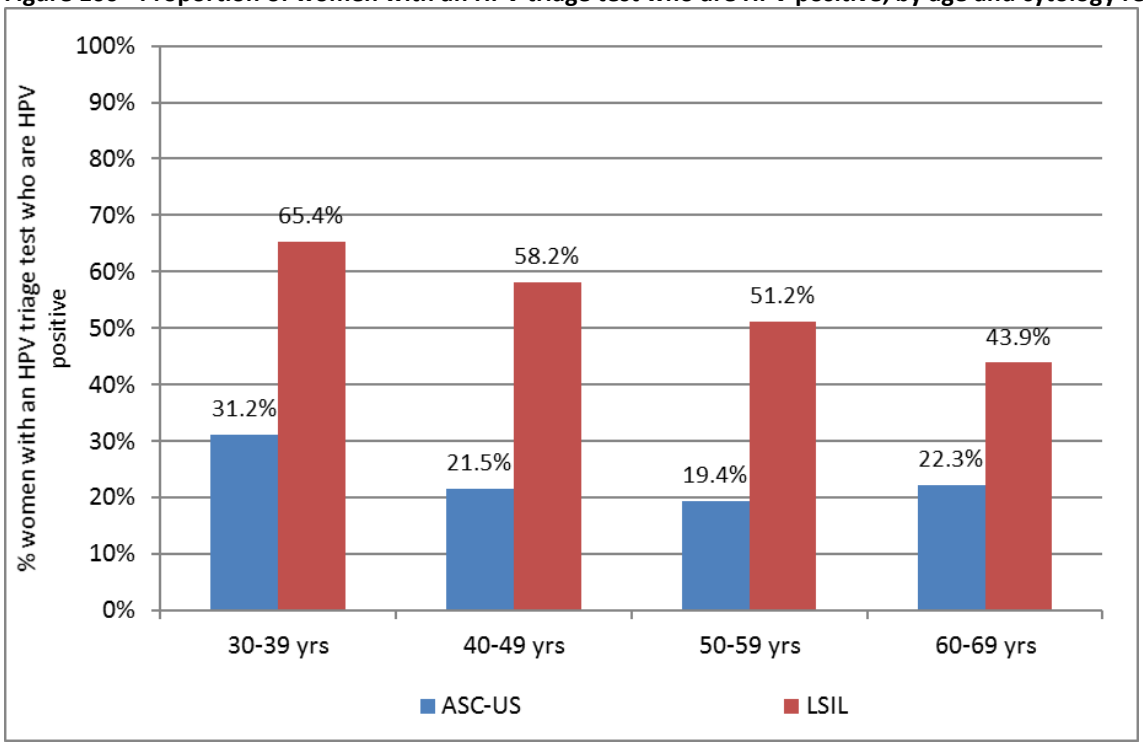


Figure 100 - Proportion of women with an HPV triage test who are HPV positive, by age and cytology result



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	1	410	1	100.0	39	29.3	19	14.4	20	23.5	7	13.5	1	12.5
Canterbury Health Laboratories	0	140	0	0.0	9	19.6	4	10.3	4	11.1	3	17.6	0	0.0
LabPLUS	0	163	0	0.0	13	21.0	8	15.4	4	11.1	1	10.0	0	0.0
Medlab Central Ltd.	0	267	0	0.0	19	22.1	17	22.4	12	15.8	5	18.5	0	0.0
Pathlab	0	266	0	0.0	27	43.5	26	26.5	8	11.8	7	20.0	1	33.3
Southern Community Laboratories	5	380	3	60.0	49	44.1	38	30.9	28	30.8	20	38.5	1	33.3
Total	**6**	**1626**	**4**	**66.7**	**156**	**31.2**	**112**	**21.5**	**76**	**19.4**	**43**	**22.3**	**3**	**14.3**

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).*

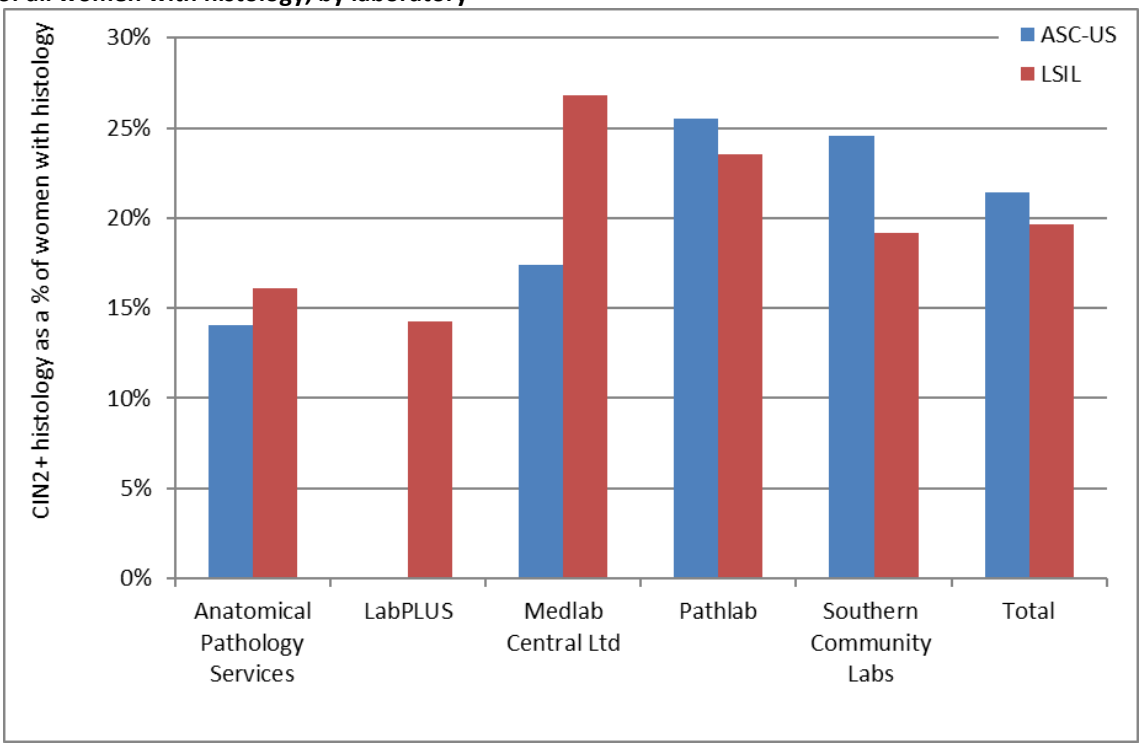
Table 22 - HPV triage test results following LSIL cytology, by age and cytology laboratory

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	370	1	50.0	109	59.9	61	57.0	26	45.6	13	56.5	1	100.0
Canterbury Health Laboratories	0	55	-	-	21	80.8	6	42.9	7	70.0	1	20.0	0	0.0
LabPLUS	1	63	1	100.0	23	67.6	8	42.1	1	16.7	1	25.0	0	0.0
Medlab Central Ltd.	1	152	1	100.0	32	51.6	31	53.4	12	52.2	1	11.1	0	0.0
Pathlab	1	273	0	0.0	74	64.9	46	63.9	33	53.2	13	56.5	0	0.0
Southern Community Laboratories	10	645	6	60.0	200	70.4	114	61.0	65	52.8	21	42.0	0	0.0
Total	**15**	**1558**	**9**	**60.0**	**459**	**65.4**	**266**	**58.2**	**144**	**51.2**	**50**	**43.9**	**1**	**25.0**

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

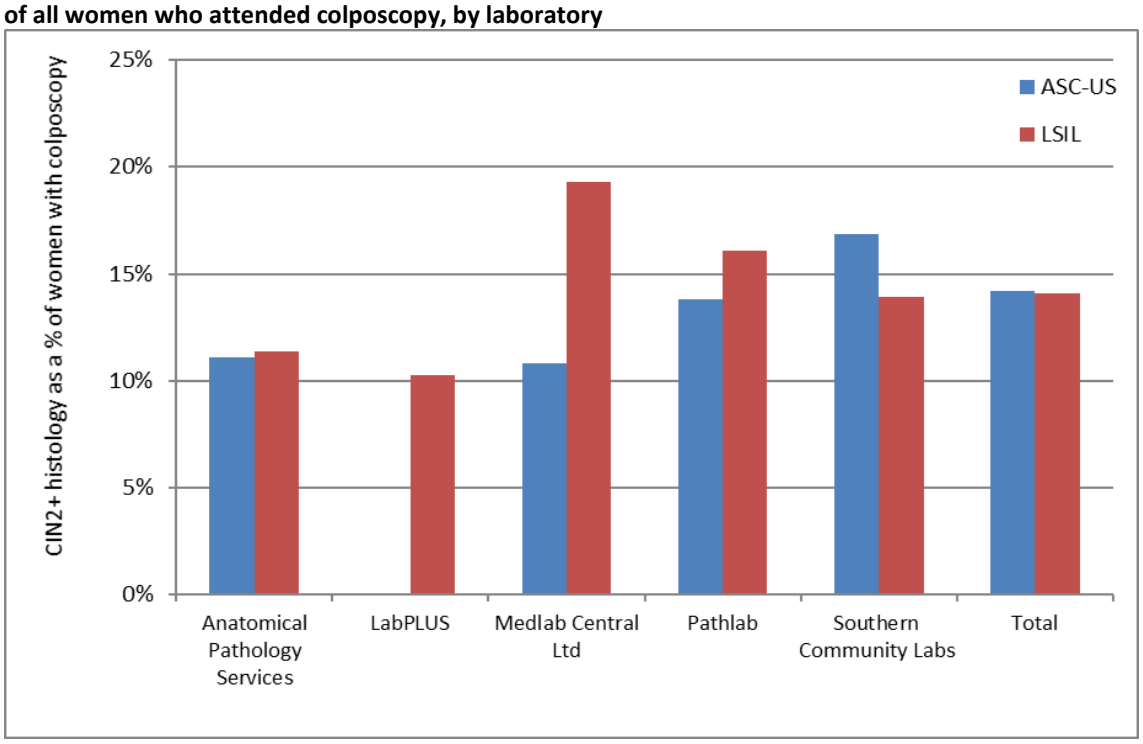
** Additionally excludes women with any previous squamous high -grade (cytology or histology).*

Figure 101 – 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 81 and Table 82).

Figure 102 – 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 81 and Table 82).

Figure 103 - Women with histologically-confirmed CIN 2+ within 12 months, as a percentage of all women who attended colposcopy, by laboratory and referral cytology

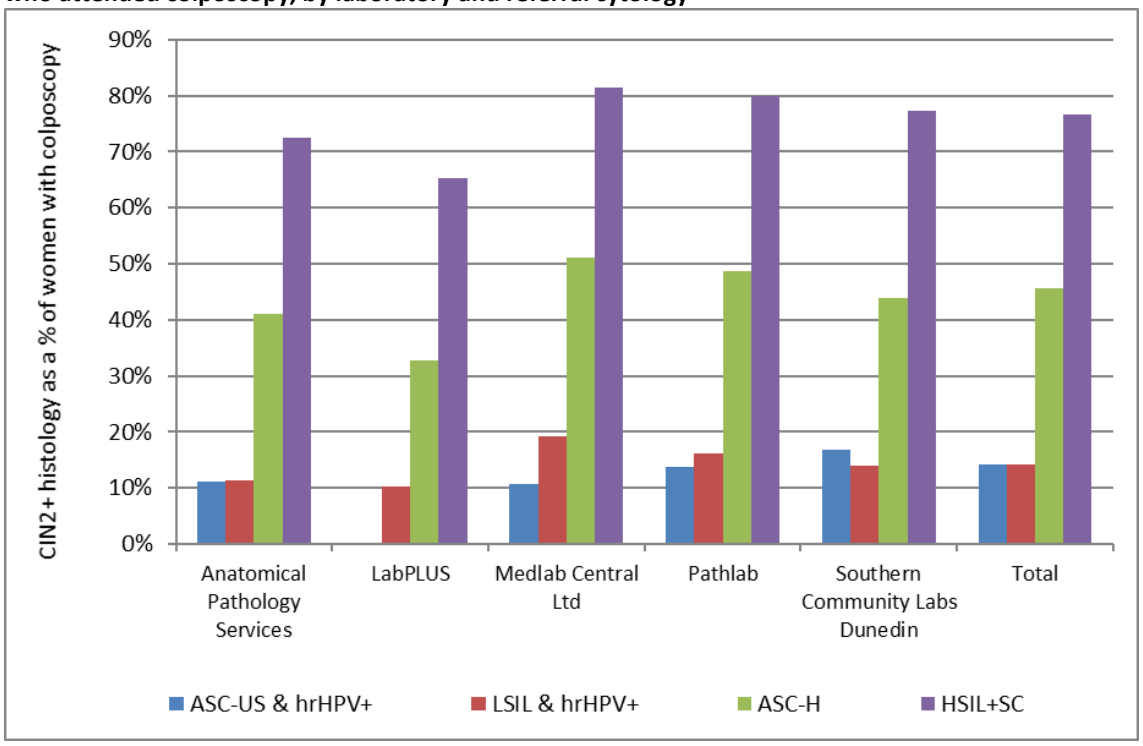


Figure 104 – Triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with histology recorded, by age

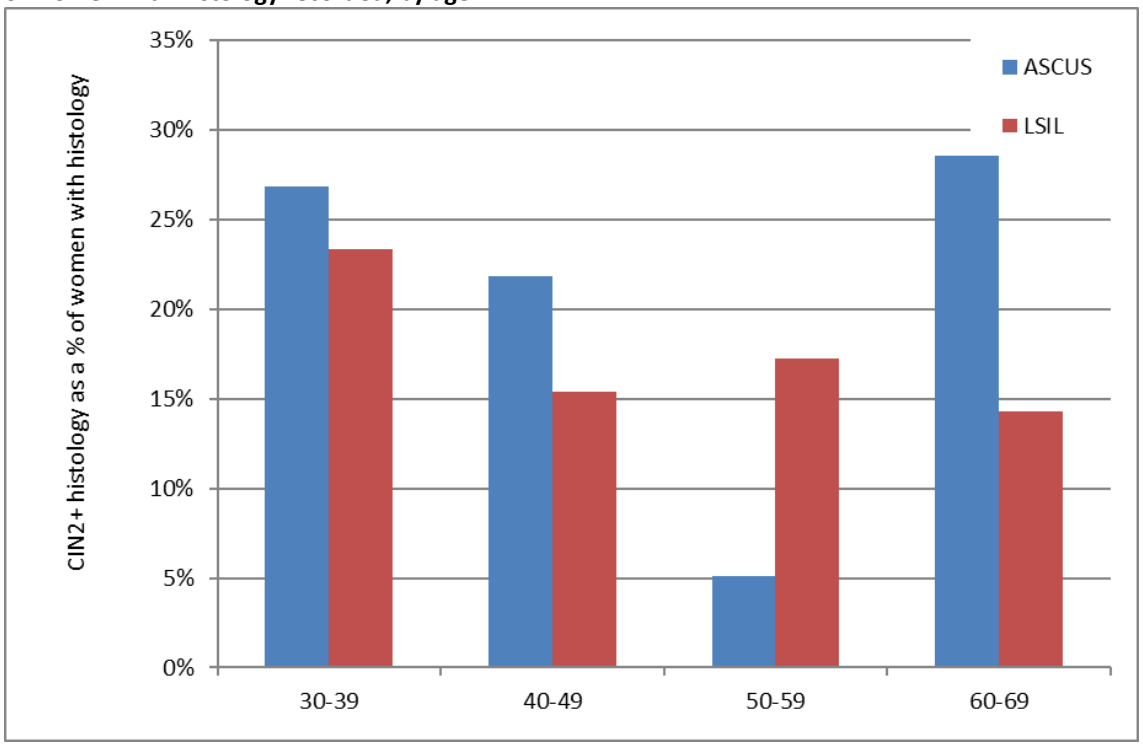


Figure 105 – Triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with colposcopy recorded, by age

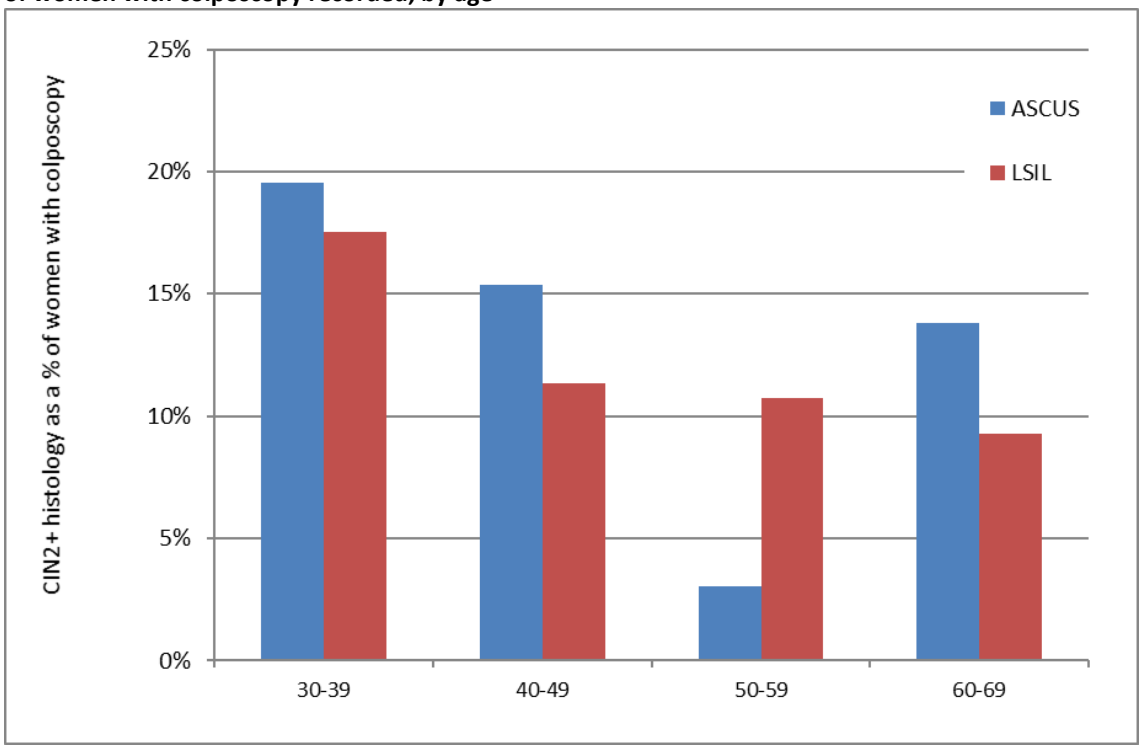
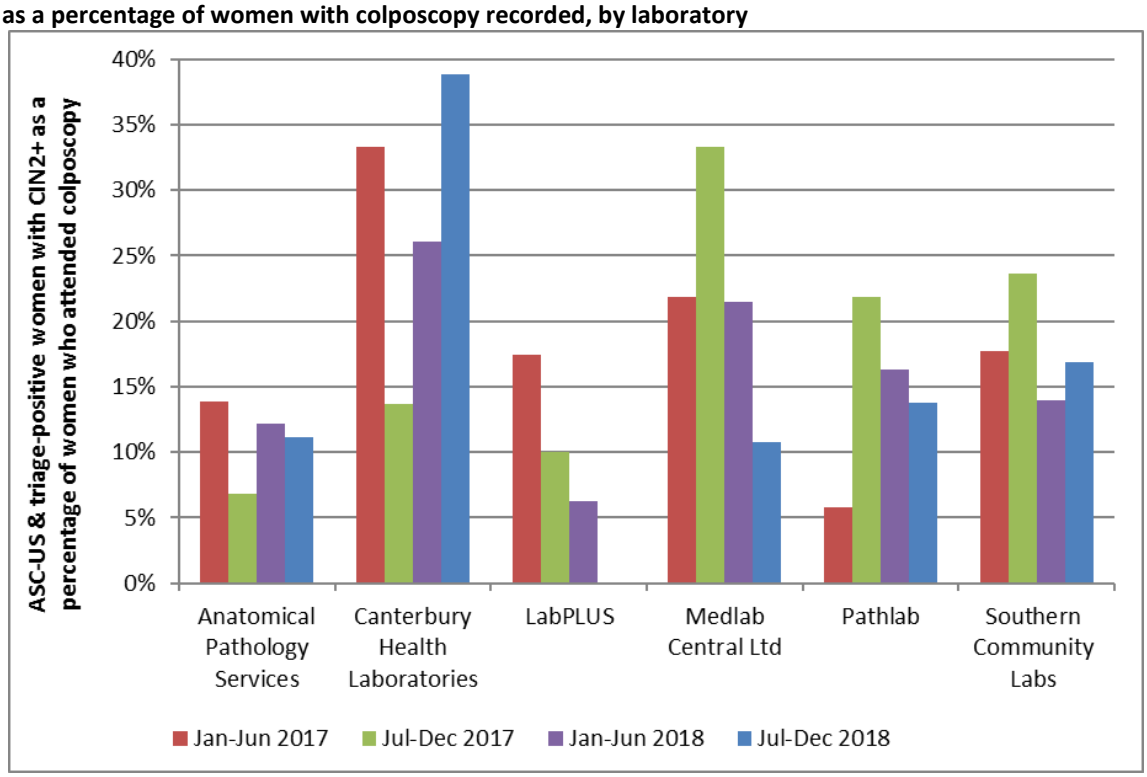
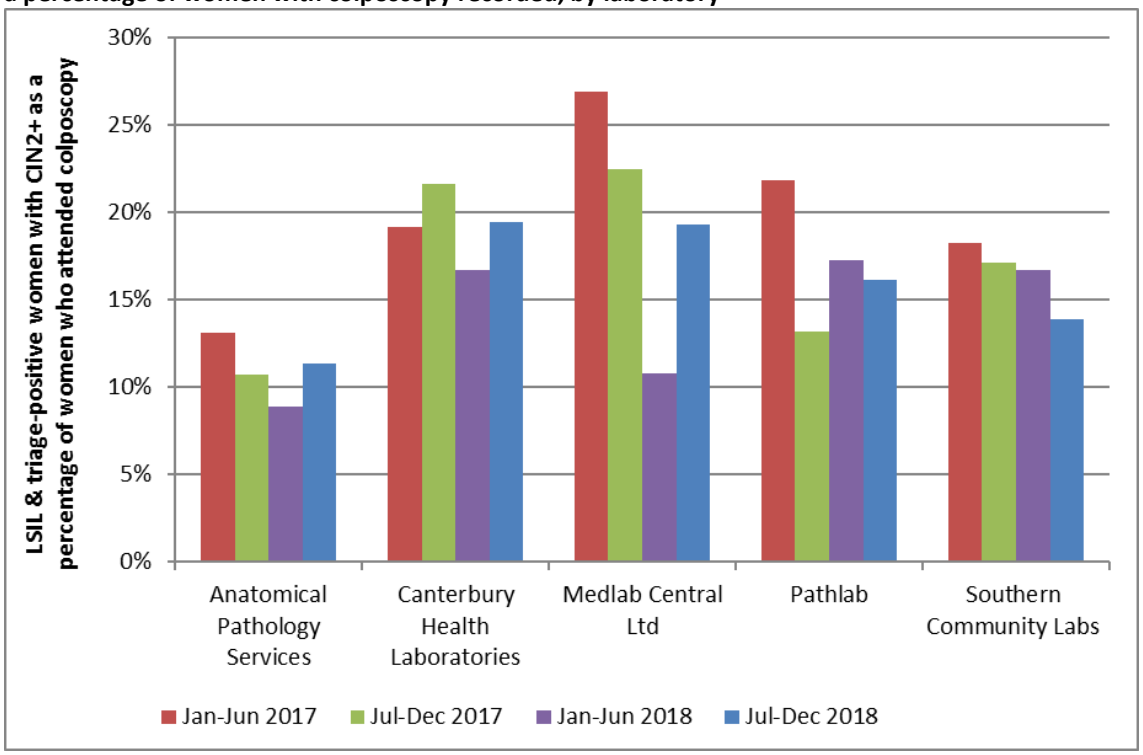


Figure 106 – Trends in ASC-US triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with colposcopy recorded, by laboratory



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 81.

Figure 107 – 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 82.

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 17,419 samples received by laboratories for HPV testing within the current monitoring period. These are reported on further in Table 83 to Table 89. Virtually all (98.2%) samples for HPV testing were from women aged 20-69 years. The large majority of women (86.5%) were aged 30 years or more (Figure 108, Table 87).

The number of samples received by laboratories for HPV testing ranged from 717 (LabPLUS; 4.1% of all HPV tests) to 7,698 (Southern Community Labs; 44.2% of all HPV tests; Figure 109, Table 83). Figure 110 and Table 83 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 8.1% across New Zealand – that is, on average 8.1% of cytology tests are associated with an HPV test. This ratio varied by laboratory from 7.0% (Southern Community Labs; i.e. fewer HPV tests processed in relation to cytology tests processed than the national average) to 12.9% (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 86. The overall proportion of HPV tests with invalid results was 0.03% (Table 84). The proportion was small for the HPV test technologies reported (Table 85).

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 2,558 (14.7%) were for post-treatment management for women treated in the past four years; 6,221 (35.7%) were for follow-up management of women with high -grade squamous cytology or histology more than three years previously (historical testing); 1,224 (7.0%) were on samples collected at a colposcopy visit which did not fit into a previous category (possibly for resolution of discordant results); and 2,989 (17.2%) were for triage of low-grade cytology in women aged 30 years or more. There were 4,427 (25.4%) HPV tests that did not fit into any of the previously described categories (Figure 111). Further breakdowns of HPV tests by purpose are presented by age (Figure 112, Table 87), laboratory (Figure 113, Table 88), and ethnicity (Table 86).

There were variations in HPV test purpose by age (Figure 112, Table 87). 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 (30.8%). 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.

HPV test purpose also varied by laboratory (Figure 113, Table 88). 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 13.8% at LabPLUS to 32.7% at Southern Community Labs. The proportion of tests performed for post-treatment management varied from 12.6% (Pathlab) to 21.1% (Canterbury Health Laboratories), while the proportion performed to follow up women with historical high -grade squamous abnormalities varied from 21.8% (LabPLUS) to 42.3% (Pathlab). The proportion of tests where the sample was collected at colposcopy but not for one of the previous purposes ranged from 2.6% (Medlab Central Ltd) to 20.8% (LabPLUS). The proportion of tests performed for HPV triage ranged from 12.2% (Southern Community Labs) to 30.7% (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 86).

Tests in the 'Other' category were further explored. A proportion of the 'Other' tests (3.0%; 131 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 5.3% occurred after treatment, but did not meet the criteria for post-treatment management because they occurred within 6 months of treatment (1.5%; 68 tests), or after treatment of a non-squamous high -grade (1.0%; 44 tests), or a non-high -grade (2.7%; 121 tests) or cervical cancer (0.07%; 3 tests). A further 16.9% 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 (8.8%; 388 tests), the high -grade squamous cytology was less than three years ago (8.0%; 355 tests), or the histology diagnosis was cervical cancer (0.2%; 7 tests).

A larger proportion of the 'Other' tests (26.1%;1,155 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 (20.8%; 922 tests), but some suggested prior high -grade histology (5.3%; 233 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 (2.6%; 116 tests), a record suggesting a previous low-grade cytology not explicitly recorded on the NCSP Register (2.9%; 128 tests), or collected by a specialist where none of the other reasons applied (5.2%; 229 test). After this exploration, there remained 1,682 tests (38.0% of 'Other' tests; 9.7% 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 (83.6%; 873 tests) than from private facilities (16.4%; 171 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 8.9% of colposcopies. In DHBs where HPV tests were collected at colposcopy, this value ranged from 0.6% (Tairawhiti) to 33.8% (Lakes), and was 8.5% overall across all public DHB clinics (Figure 114, Table 89). In private practice, this rate was 12.1%.

Trends

The volume of HPV samples received at laboratories for testing in the current monitoring period was 17,419 and 18,302 in the previous monitoring period, a decrease of 4.8%. Only one laboratory, Medlab Central Ltd, experienced an increase in the number of samples received between the previous and current monitoring periods (1,588 to 1,649 tests; 3.8% increase). The laboratory with the largest percentage decrease in the number of tests between the previous and current period was Pathlab (from 2,565 to 2,291 tests; 10.7% decrease). Trends by laboratory can be seen in Figure 115.

Changes in HPV test volumes varied across all test purpose categories. Within the four guidelines categories (post-treatment, historical testing, HPV triage or tests at colposcopy), the increase in the number of tests performed was greatest for HPV triage (3.9% increase; 111 tests) and the greatest decrease was seen in HPV tests taken at colposcopy (decrease of 11.8%% or 164 tests; Figure 116). A decrease was also seen in both the number of HPV tests in the 'Other' category (214 tests) but the percent of all HPV tests in this category remained similar (25.4%). The proportion of tests in each of the other four categories was broadly similar to that seen in the previous report (14.7% for post-treatment management; from 36.6% to 35.7% for historical testing; and from 15.7% to 17.2% for triage of low-grade cytology, from 7.6% to 7.0% for

tests taken at colposcopy). The proportion of HPV tests which are invalid remains very small (Table 85).

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 110, Table 83). 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 (26.1%) is slightly less than that in the previous report (26.6%), and the number of tests in this category has also decreased since the previous report (from 1,236 to 1,155). 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 was corrected in Report 49 and the increase in tests collected at colposcopy is explained by this change. The number of tests collected at colposcopy has reduced since Report 49.

Figure 108 - Volume of HPV test samples received by laboratories during the monitoring period, by age

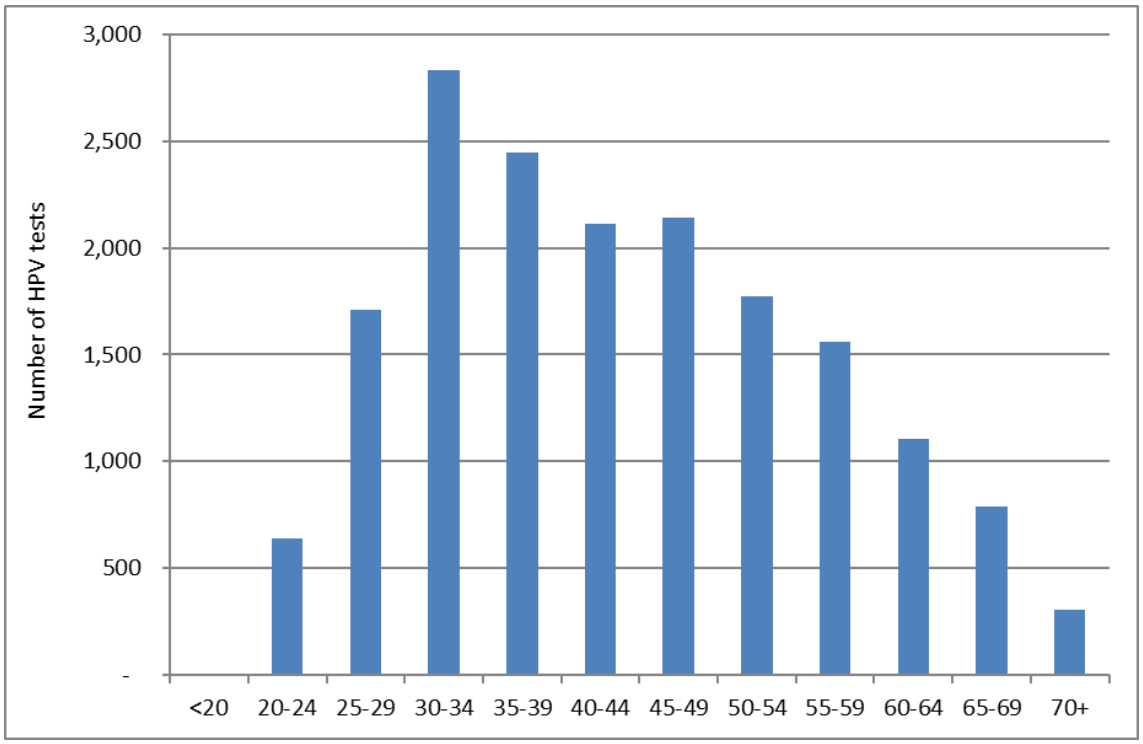


Figure 109 - Volume of HPV test samples received by laboratories during the monitoring period, by laboratory

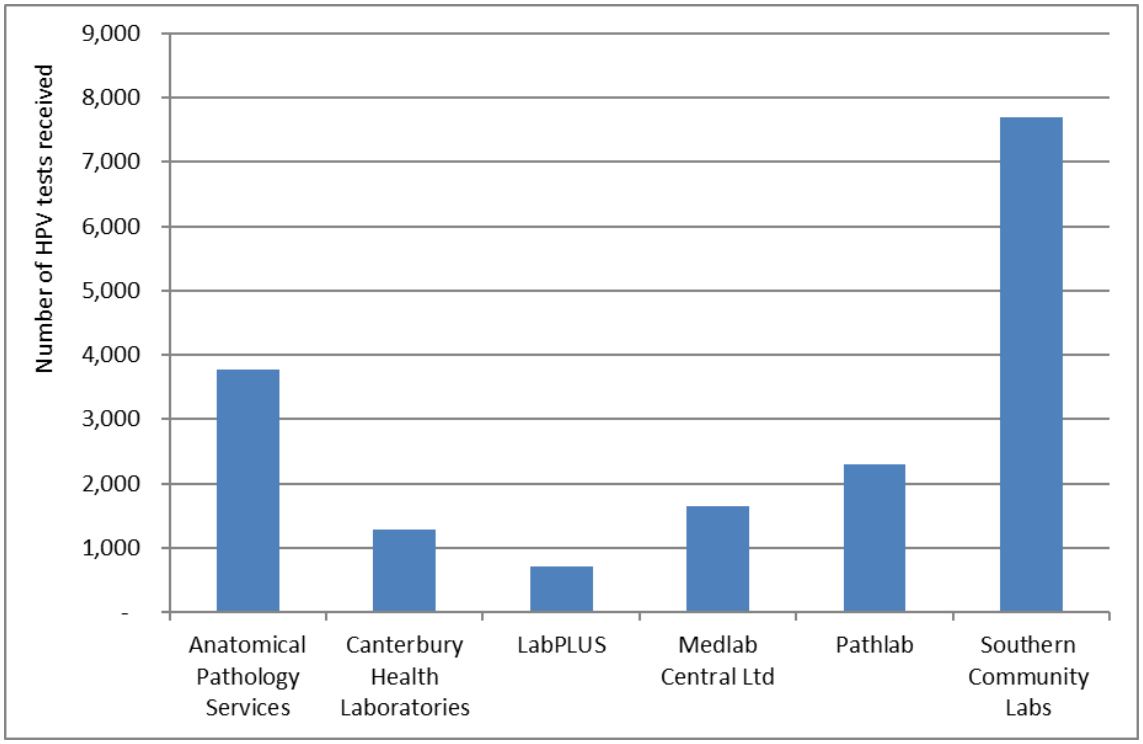
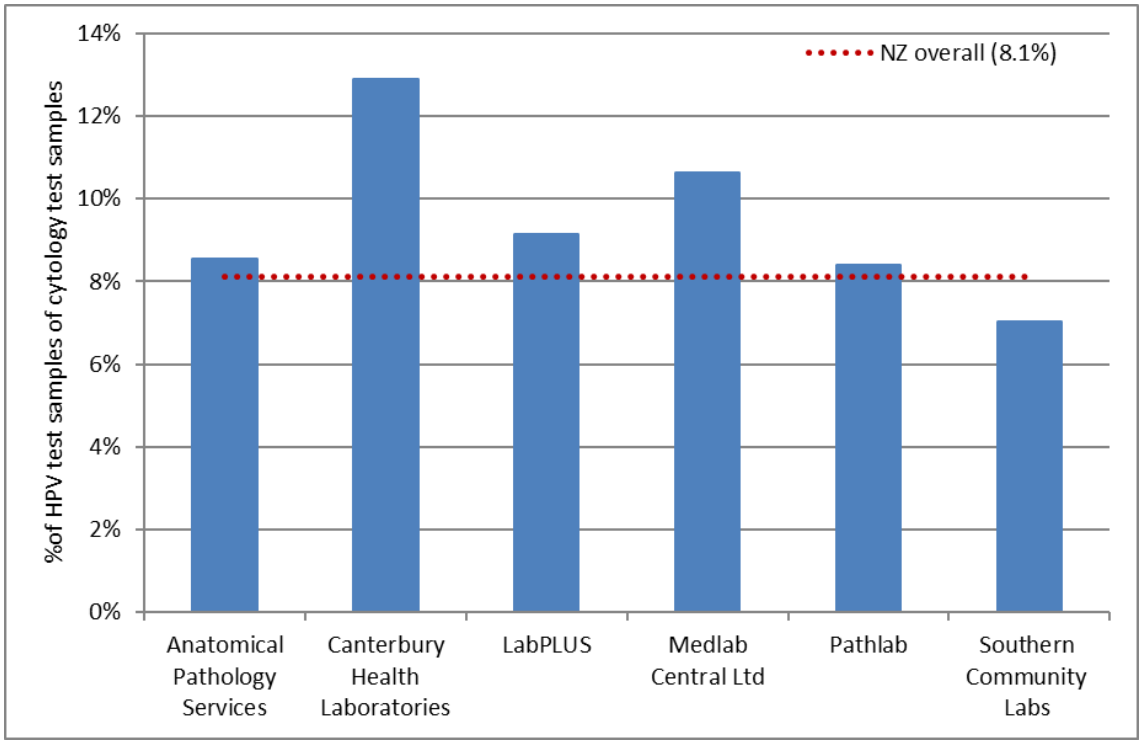


Figure 110 - HPV test samples as a percentage of cytology test samples received during the monitoring period, by laboratory



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

Figure 111 - Volume of HPV test samples received during the monitoring period, by purpose

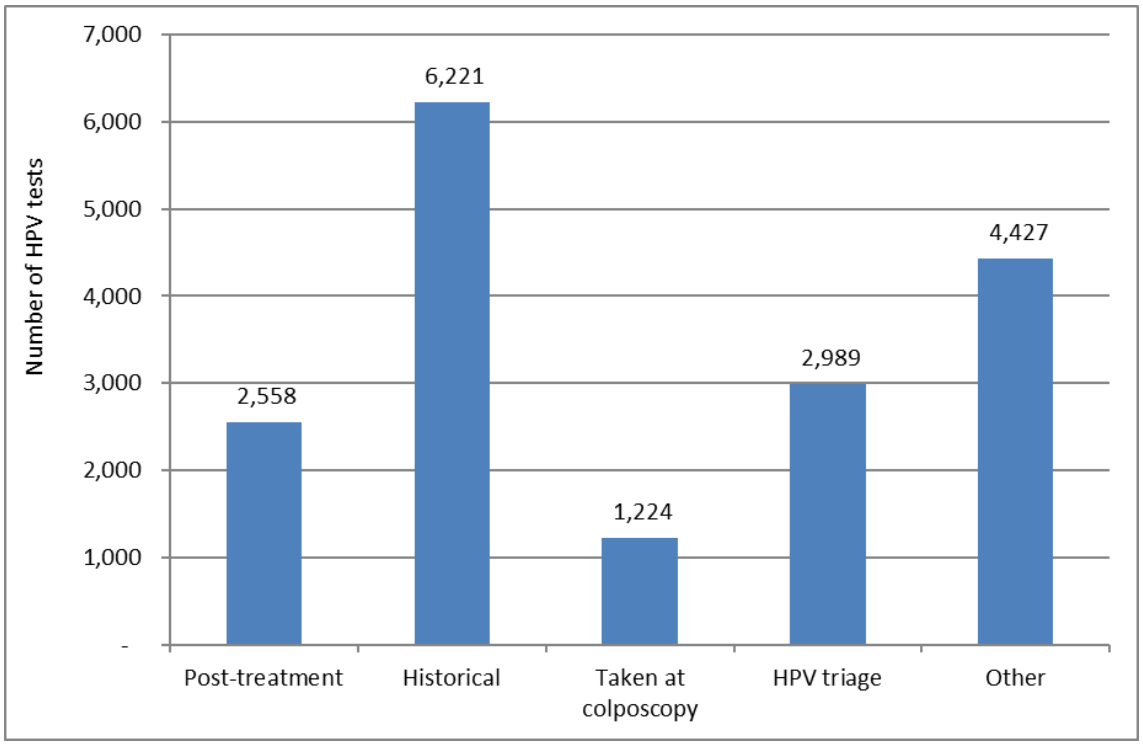


Figure 112 - HPV test samples received during the monitoring period, by purpose and age

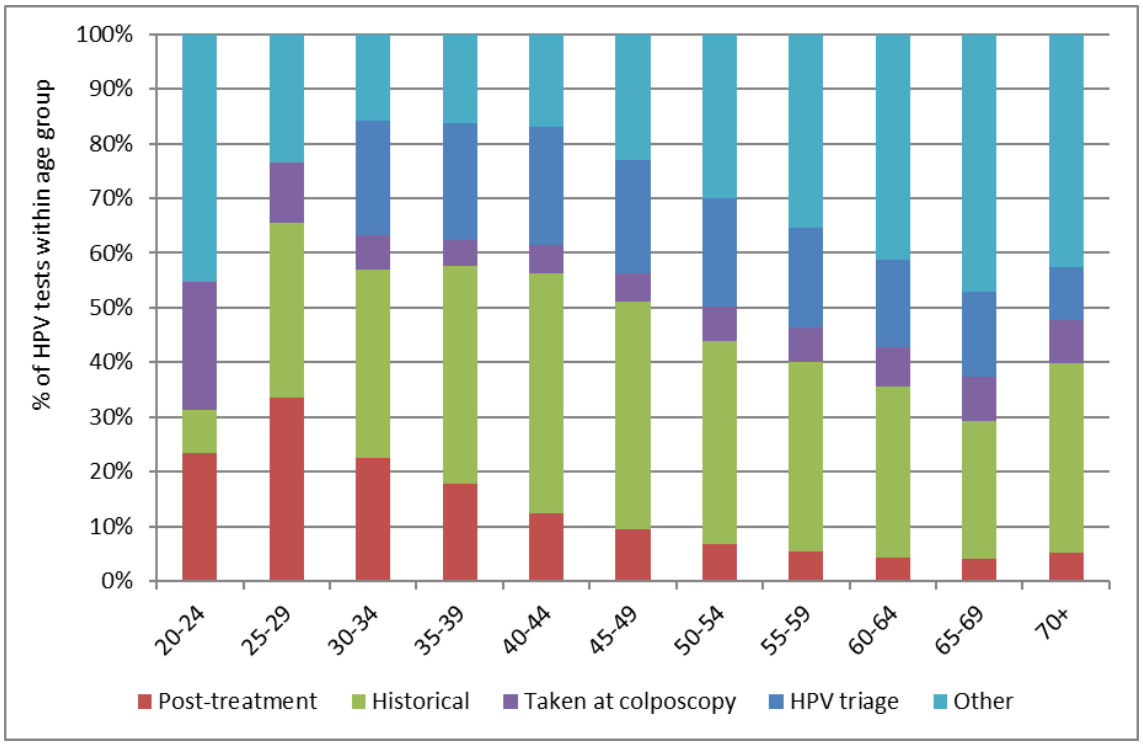


Figure 113 - HPV test samples received during the monitoring period, by purpose and laboratory

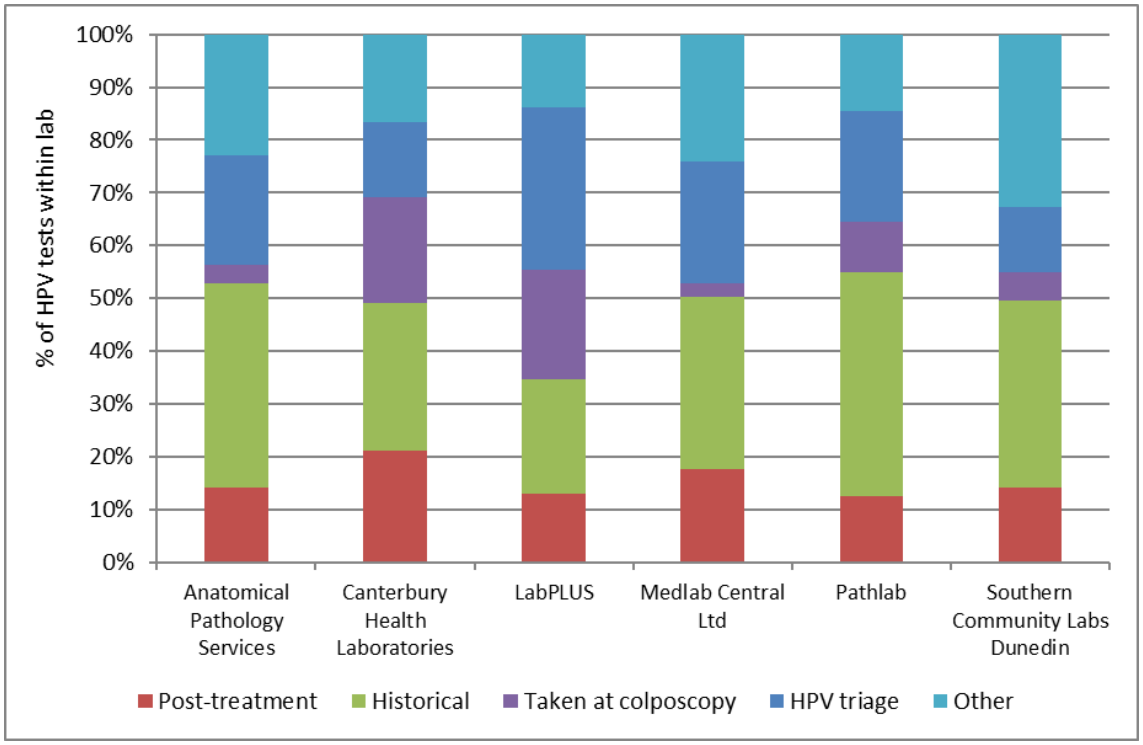
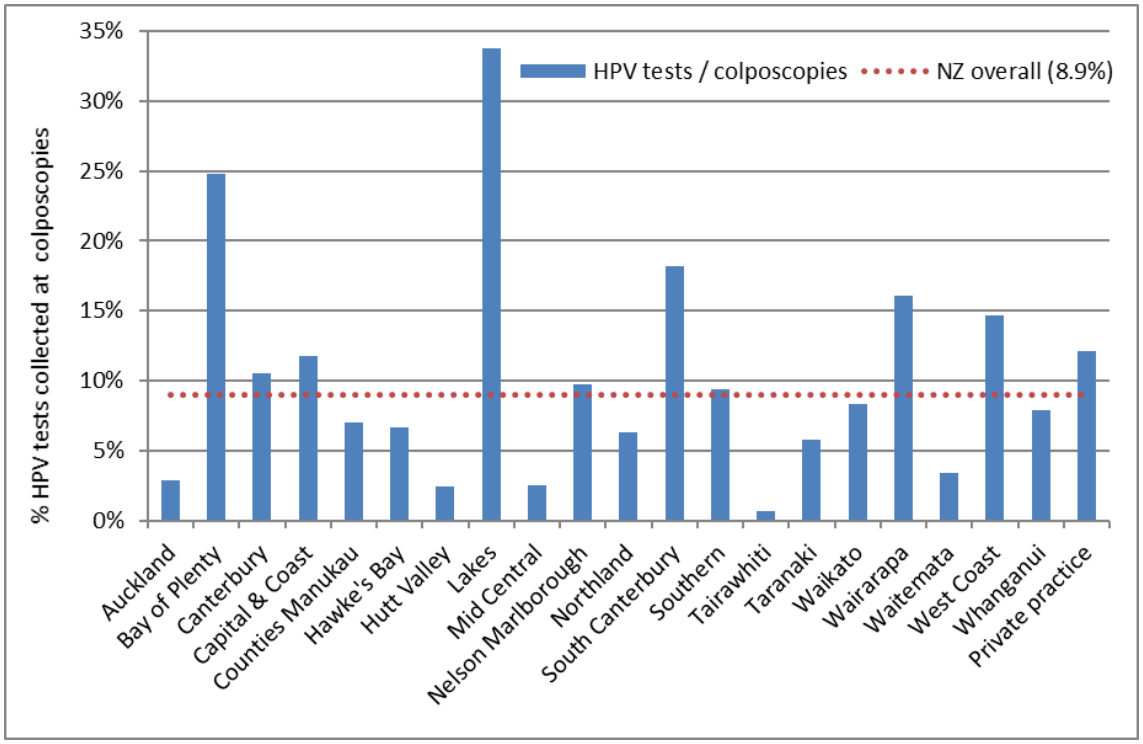


Figure 114 - HPV test samples collected at colposcopy, in relation to total colposcopies* performed in the period, by DHB



*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 115 - Trends in volumes of HPV test samples received, by laboratory

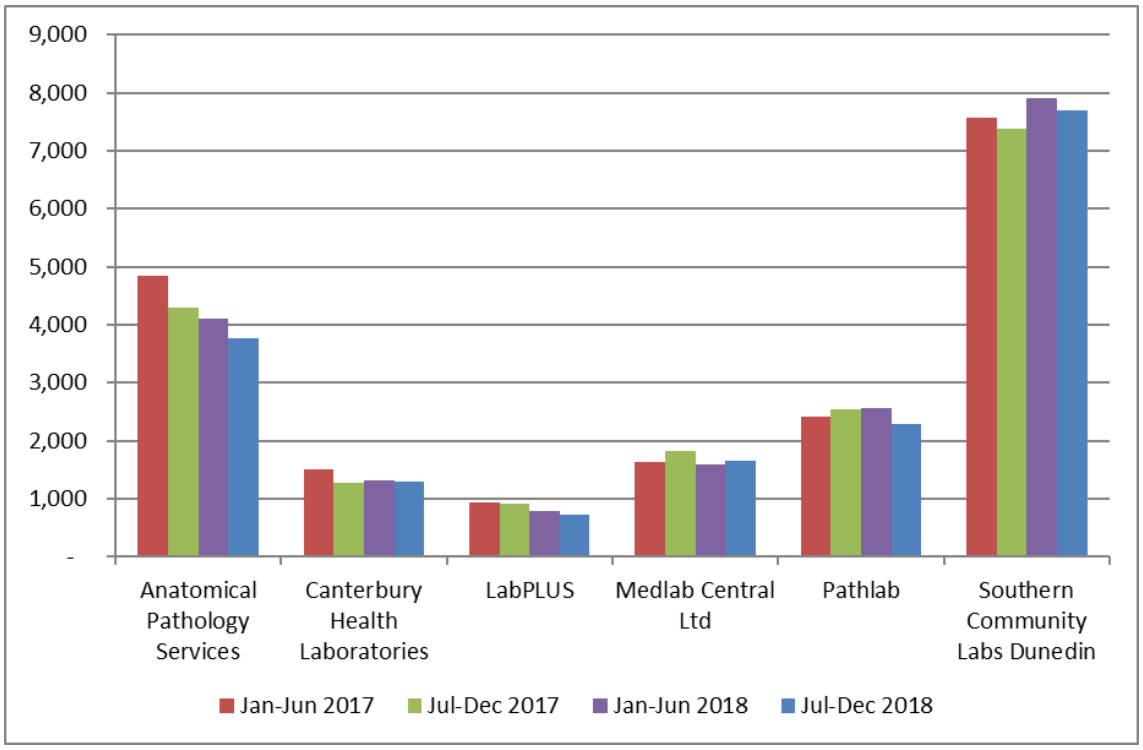


Figure 116 - Trends in volumes of HPV test samples received, by purpose

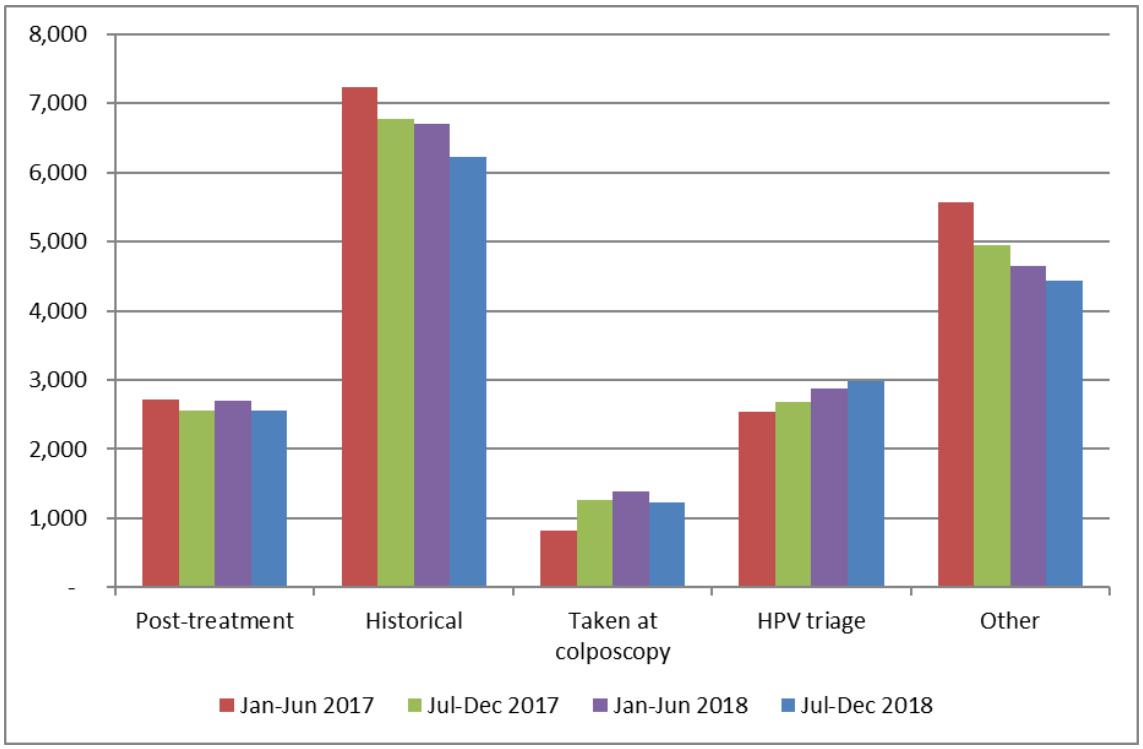
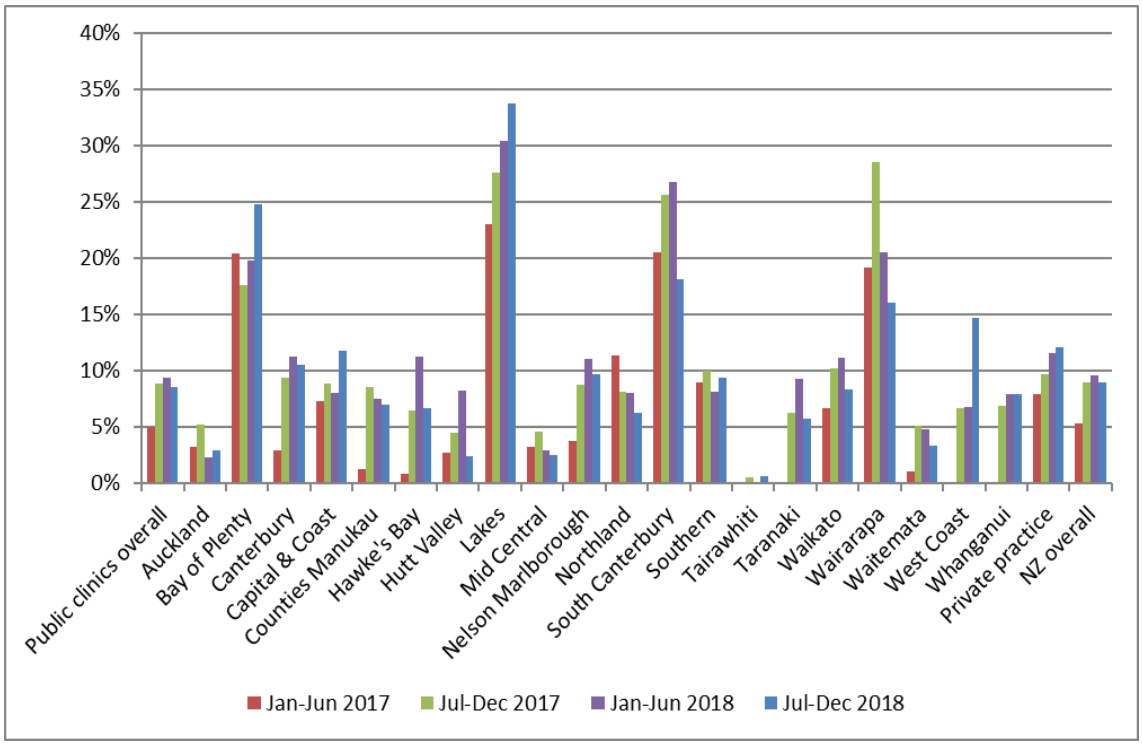


Figure 117 - Trends in HPV test samples collected at colposcopy, in relation to total colposcopies* performed in the period, by DHB



*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 31 December 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 50,511 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, 49,092 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 90).

HPV tests performed for historical reasons

Overall, 34,078 (69.4%) of the women eligible for historical testing have a Round 1 historical test recorded on the NCSP Register. There were 28,971 women who also have a Round 2 historical tests (59.0% of eligible women; 85.0% of those with a Round 1 test).

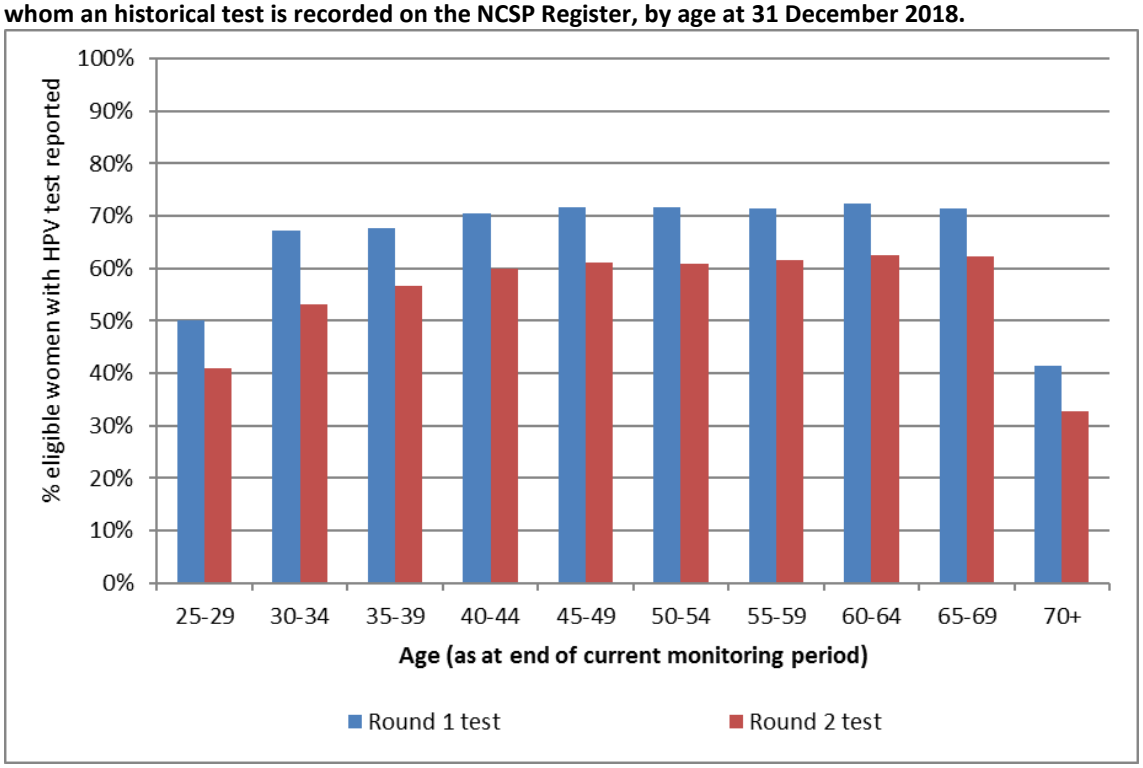
The proportion of women with historical tests varied by age. Among women aged 25 to 69 years at the end of the current monitoring period, the proportion of eligible women with a historical test varied from 50.0% (25-29 years) to 72.5% (60-64 years) for Round 1 tests, and from 40.9% (25-29 years) to 62.5% (60-64 years) for Round 2 tests (Figure 118, Table 90).

	The proportion of eligible women with historical tests also varied by DHB, from 58.6% (Counties Manukau) to 80.7% (Nelson Marlborough) for Round 1 tests, and from 45.9% (Counties Manukau) to 73.5% (Nelson Marlborough) for Round 2 tests (Figure 119, Table 91). 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 126). The proportion of eligible women with Round 1 historical tests ranged from 50.4% in Pacific women to 71.4% in European/ Other women (Figure 120, Table 92). For Round 2 tests, this proportion ranged from 39.8% in Pacific women to 61.6% 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 127, Table 93) or by ethnicity (Figure 128).
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 is higher than in the previous report from 68.0% to 69.4% for Round 1 tests, and from 57.1% to 59.0% for Round 2 tests. It has also done so in most DHBs (Figure 121), ethnicities (Figure 122) and age groups (Figure 123) between this and the previous report, except West Coast which saw a drop in women with a Round 2 test recorded (from 70.6% to 70.1%) 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 118 - 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 31 December 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 119 - 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 31 December 2018.

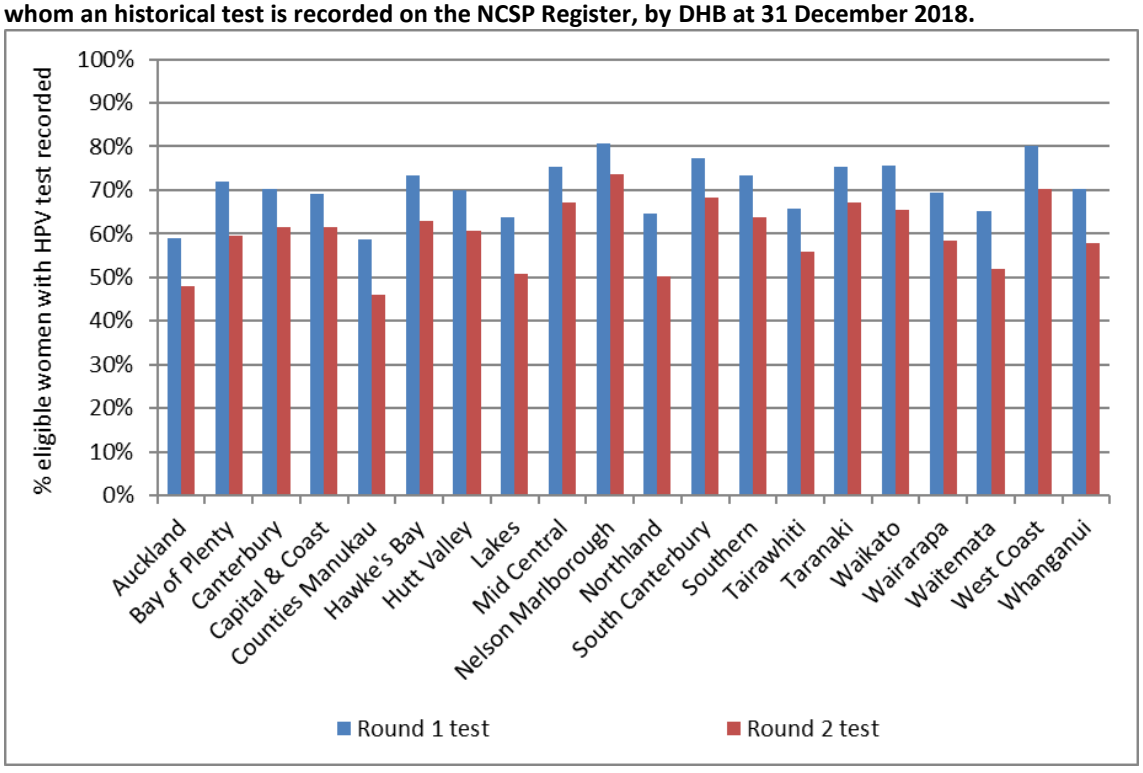


Figure 120 - Proportion of eligible women with squamous high -grade abnormality more than 3 years ago for whom an historical test is recorded on the NCSP Register, by ethnicity at 31 December 2018.

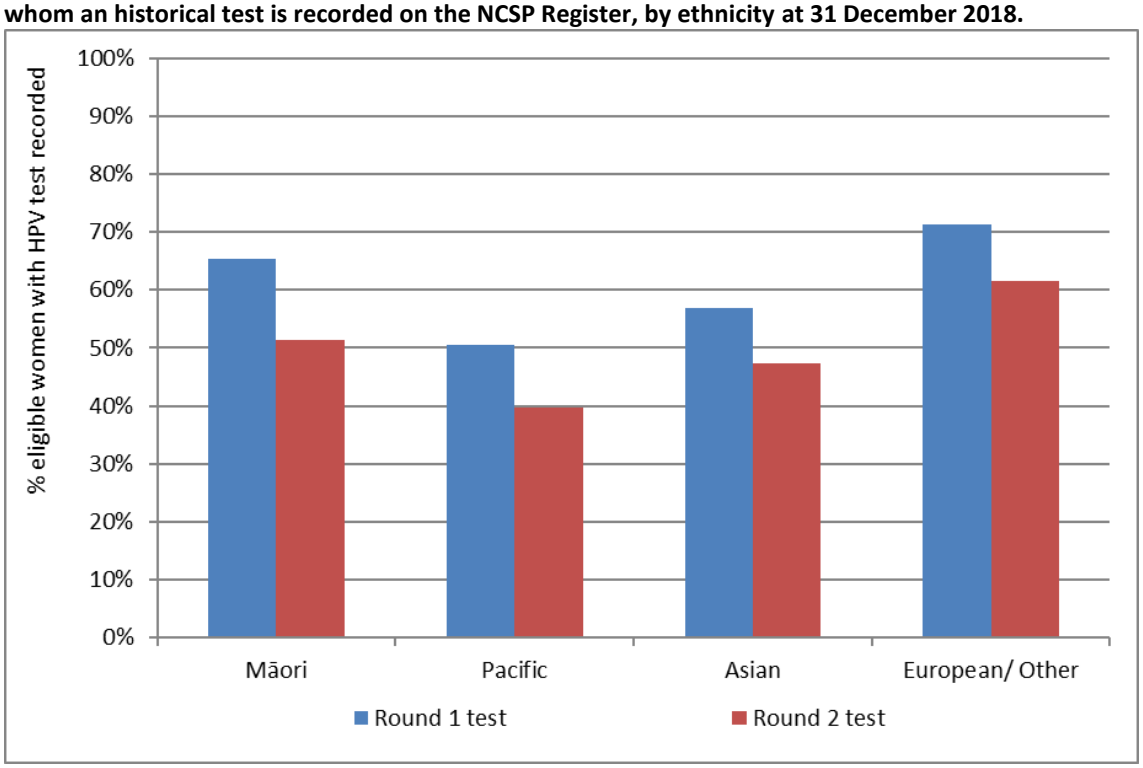


Figure 121 – Trends in the proportion of eligible women with squamous high -grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by DHB

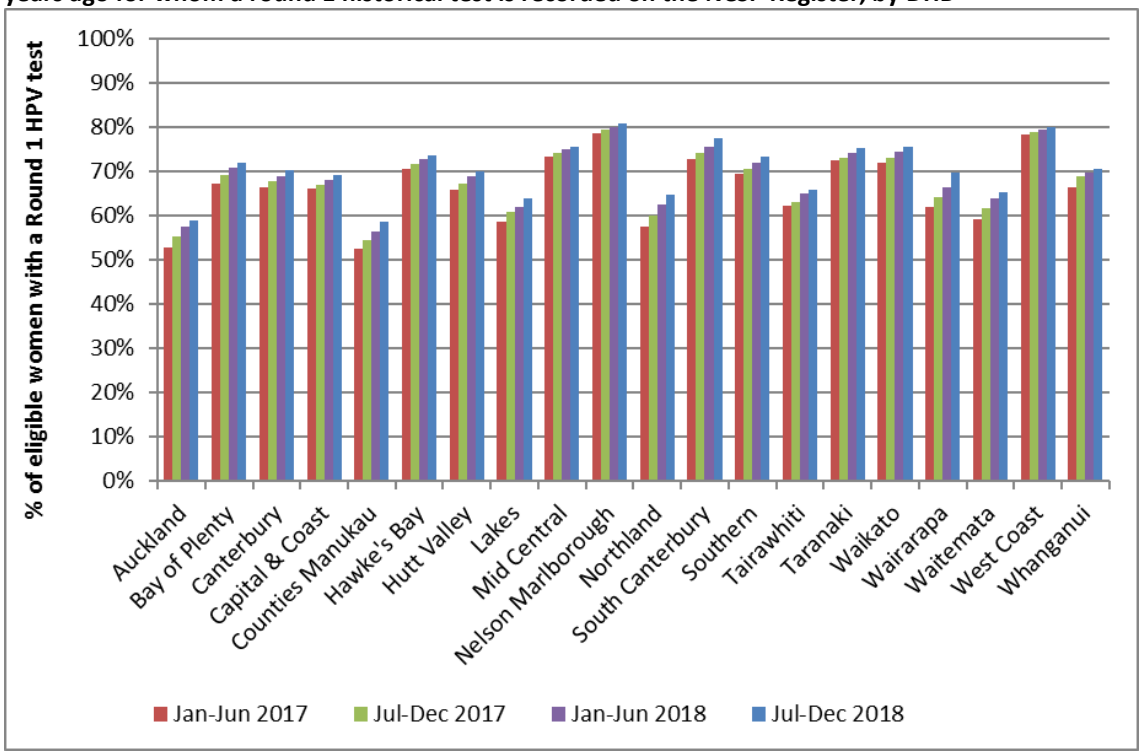


Figure 122 - Trends in the proportion of eligible women with squamous high -grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by ethnicity

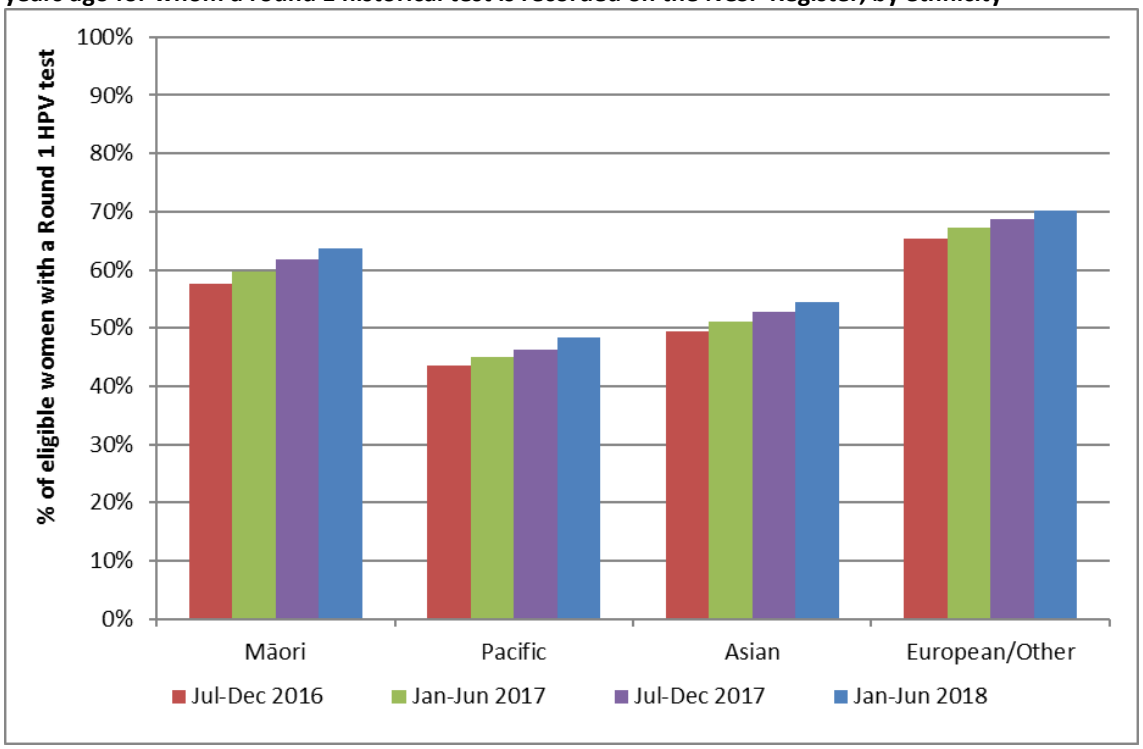
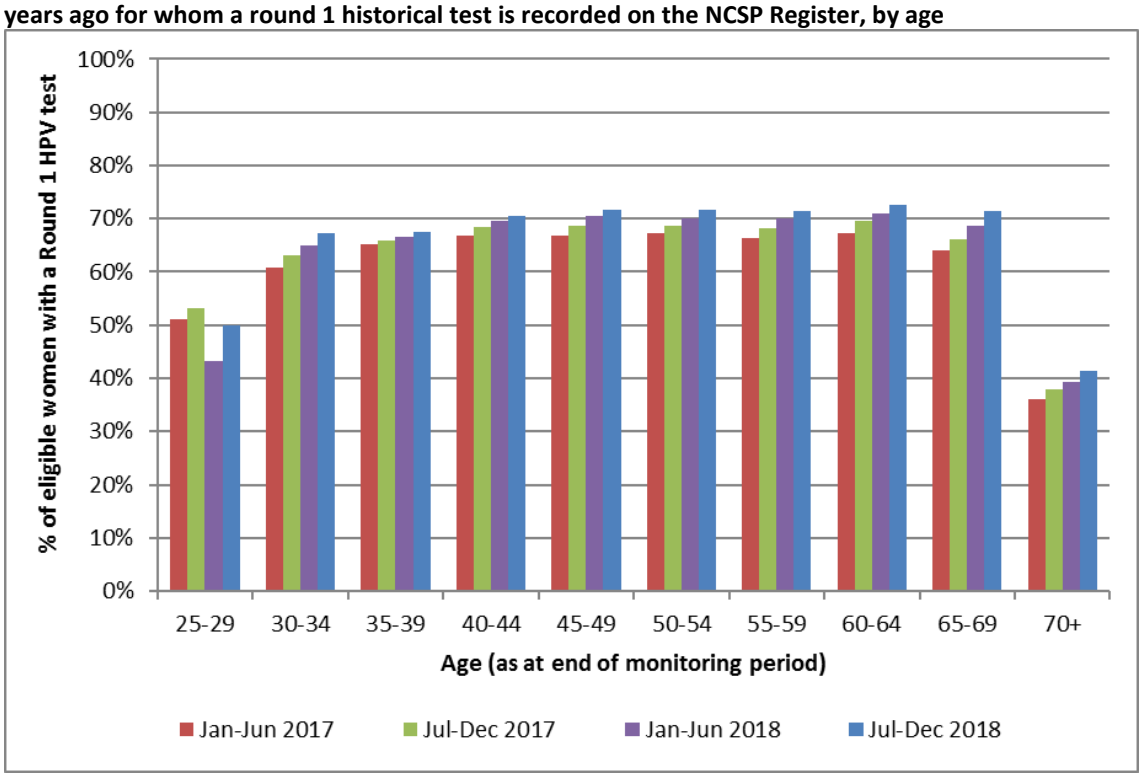


Figure 123 - Trends in the proportion of eligible women with squamous high -grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by age



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 31 December 2018, hysterectomy adjusted)

DHB	Hysterectomy adjusted population	Women screened in the last 3 years	
	N	N	%
Auckland	156,817	104,766	66.8
Bay of Plenty	61,421	48,288	78.6
Canterbury	147,066	106,972	72.7
Capital & Coast	87,288	66,046	75.7
Counties Manukau	149,605	100,763	67.4
Hawke's Bay	42,491	31,040	73.1
Hutt Valley	40,437	29,816	73.7
Lakes	28,383	21,606	76.1
Mid Central	45,368	32,712	72.1
Nelson Marlborough	39,729	30,896	77.8
Northland	45,541	31,802	69.8
South Canterbury	15,270	11,297	74.0
Southern	84,529	64,241	76.0
Tairawhiti	12,416	9,203	74.1
Taranaki	31,055	24,493	78.9
Waikato	106,771	78,900	73.9
Wairarapa	11,783	8,380	71.1
Waitemata	171,909	120,285	70.0
West Coast	8,577	6,179	72.0
Whanganui	16,255	11,742	72.2
Total	**1,302,711**	**939,427**	**72.1**

Table 24 - Three-year coverage by ethnicity (women 25-69 years screened in the three years prior to 31 December 2018, hysterectomy adjusted)

Ethnicity	Hysterectomy adjusted population (ages 25-69 years)	Women screened in the last 3 years (ages 25-69 years)	
	N	N	%
Māori	172,626	107,252	62.1
Pacific	74,909	50,389	67.3
Asian	223,535	133,998	59.9
European/ Other	831,641	647,788	77.9
Total	**1,302,711**	**939,427**	**72.1**

Table 25 – Three-year coverage by age (women 20-69 years screened in the three years prior to 31 December 2018, hysterectomy adjusted)

Age	Hysterectomy adjusted population	Women screened in the last 3 years	
	N	N	%
20-24	170,980	77,108	45.1
25-29	187,752	109,679	58.4
30-34	171,499	115,019	67.1
35-39	151,636	112,541	74.2
40-44	142,358	109,827	77.1
45-49	154,383	121,235	78.5
50-54	142,605	111,355	78.1
55-59	139,478	106,510	76.4
60-64	116,603	86,340	74.0
65-69	96,397	66,921	69.4
20-69	**1,473,691**	**1,016,535**	**69.0**

Table 26 – Three-year coverage (women aged 25-69 years screened in the three years prior to 31 December 2018, hysterectomy adjusted), by ethnicity and DHB

	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	5,651	51.3	9,413	65.9	29,696	51.9	60,006	80.8
Bay of Plenty	8,687	65.4	581	64.8	2,854	54.4	36,166	86.1
Canterbury	5,967	55.7	2,266	76.8	11,179	66.5	87,560	75.1
Capital & Coast	5,122	58.4	3,443	62.8	8,662	59.2	48,819	83.6
Counties Manukau	12,017	59.5	19,445	68.7	28,285	65.3	41,016	71.0
Hawke's Bay	6,835	72.3	892	74.6	1,435	57.1	21,878	74.6
Hutt Valley	3,746	64.2	1,810	65.7	3,862	71.8	20,398	77.1
Lakes	6,232	70.6	468	83.0	1,466	50.7	13,440	83.4
Mid Central	5,167	67.3	778	73.5	2,332	54.7	24,435	75.5
Nelson Marlborough	2,294	67.0	396	79.5	1,439	65.0	26,767	79.7
Northland	8,553	63.1	441	53.5	1,253	50.5	21,555	75.2
South Canterbury	592	54.7	115	92.7	469	68.3	10,121	75.7
Southern	4,057	58.4	976	72.7	3,321	47.1	55,887	80.8
Tairawhiti	4,082	70.5	169	64.5	244	59.8	4,708	79.0
Taranaki	3,265	68.1	215	70.3	1,069	65.2	19,944	82.0
Waikato	13,204	62.9	1,842	64.4	7,736	64.3	56,118	79.2
Wairarapa	1,123	66.4	144	82.3	235	53.0	6,878	72.6
Waitemata	7,476	54.1	6,700	63.2	27,832	64.6	78,277	75.0
West Coast	556	61.2	59	62.1	213	60.9	5,351	74.1
Whanganui	2,626	68.2	236	71.3	416	47.9	8,464	75.5
NZ overall		**62.1**		**67.3**		**59.9**		**77.9**

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 31 December 2018, hysterectomy adjusted), by ethnicity and age

Age group	Māori		Pacific		Asian		European/ Other	
	N	%	N	%	N	%	N	%
25-29	17,141	57.9	7,203	50.7	15,320	41.2	70,015	65.6
30-34	14,819	60.9	6,772	60.7	23,332	60.8	70,096	71.8
35-39	12,887	60.5	6,521	67.1	23,224	67.8	69,909	80.9
40-44	12,829	62.5	6,375	70.7	16,484	64.1	74,139	85.1
45-49	13,689	64.9	6,223	71.2	15,538	64.8	85,785	85.3
50-54	12,075	66.4	6,036	76.5	13,012	63.2	80,232	83.6
55-59	11,003	65.4	4,887	77.6	11,309	62.7	79,311	80.7
60-64	7,769	63.7	3,712	82.4	9,620	64.5	65,239	76.8
65-69	5,040	58.9	2,660	78.5	6,159	58.5	53,062	71.8
NZ overall		**62.1**		**67.3**		**59.9**		**77.9**

Table 28 – Five-year coverage by DHB (women aged 25-69 years screened in the five years prior to 31 December 2018, hysterectomy adjusted)

DHB	Hysterectomy adjusted population	Women screened in the last 5 years	
	N	N	%
Auckland	156,817	125,853	80.3
Bay of Plenty	61,421	56,089	91.3
Canterbury	147,066	126,417	86.0
Capital & Coast	87,288	78,349	89.8
Counties Manukau	149,605	122,903	82.2
Hawke's Bay	42,491	37,408	88.0
Hutt Valley	40,437	35,744	88.4
Lakes	28,383	25,425	89.6
Mid Central	45,368	38,483	84.8
Nelson Marlborough	39,729	36,348	91.5
Northland	45,541	38,510	84.6
South Canterbury	15,270	13,385	87.7
Southern	84,529	75,484	89.3
Tairawhiti	12,416	10,997	88.6
Taranaki	31,055	28,357	91.3
Waikato	106,771	91,995	86.2
Wairarapa	11,783	10,082	85.6
Waitemata	171,909	143,694	83.6
West Coast	8,577	7,432	86.7
Whanganui	16,255	14,075	86.6
NZ OVERALL	**1,302,711**	**1,117,030**	**85.7**

Table 29 – Five-year coverage by ethnicity (women aged 25-69 years screened in the five years prior to 31 December 2018, hysterectomy adjusted)

Ethnicity	Hysterectomy adjusted population	Women screened in the last 5 years	
	N	N	%
Māori	172,626	133,350	77.2
Pacific	74,909	65,085	86.9
Asian	223,535	156,949	70.2
European/ Other	831,641	761,646	91.6
NZ OVERALL	**1,302,711**	**1,117,030**	**85.7**

Table 30 - Five-year coverage by age (women 20-69 years screened in the five years prior to 31 December 2018, hysterectomy adjusted)

Age	Hysterectomy adjusted population	Women screened in the last 5 years	
	N	N	%
20-24	170,980	82,208	48.1
25-29	187,752	133,979	71.4
30-34	171,499	138,465	80.7
35-39	151,636	134,239	88.5
40-44	142,358	130,461	91.6
45-49	154,383	143,716	93.1
50-54	142,605	131,862	92.5
55-59	139,478	124,890	89.5
60-64	116,603	100,835	86.5
65-69	96,397	78,583	81.5
20-69	**1,473,691**	**1,199,238**	**81.4**

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

DHB	Māori		Pacific		Asian		European/ Other	
	N	%	N	%	N	%	N	%
Auckland	7,080	64.3	12,184	85.3	35,523	62.1	71,066	95.6
Bay of Plenty	10,745	80.9	701	78.1	3,236	61.7	41,407	98.6
Canterbury	7,256	67.8	2,823	95.7	12,883	76.6	103,455	88.7
Capital & Coast	6,305	71.9	4,400	80.3	10,122	69.2	57,522	98.5
Counties Manukau	15,311	75.8	25,692	90.8	33,114	76.4	48,786	84.4
Hawke's Bay	8,625	91.2	1,144	95.7	1,645	65.5	25,994	88.6
Hutt Valley	4,775	81.8	2,325	84.4	4,522	84.1	24,122	91.1
Lakes	7,588	86.0	555	98.4	1,709	59.1	15,573	96.7
Mid Central	6,315	82.2	952	89.9	2,637	61.9	28,579	88.3
Nelson Marlborough	2,813	82.1	469	94.2	1,649	74.5	31,417	93.5
Northland	11,007	81.1	548	66.4	1,439	58.0	25,516	89.0
South Canterbury	723	66.8	145	116.9	536	78.0	11,981	89.6
Southern	4,899	70.6	1,194	88.9	3,832	54.3	65,559	94.8
Tairawhiti	5,045	87.2	202	77.1	285	69.9	5,465	91.7
Taranaki	3,934	82.0	256	83.7	1,231	75.1	22,936	94.3
Waikato	16,133	76.8	2,268	79.3	8,736	72.6	64,858	91.5
Wairarapa	1,432	84.7	187	106.9	276	62.3	8,187	86.4
Waitemata	9,419	68.2	8,689	81.9	32,867	76.3	92,719	88.8
West Coast	675	74.3	68	71.6	239	68.3	6,450	89.3
Whanganui	3,270	85.0	283	85.5	468	53.9	10,054	89.7
NZ OVERALL	**133,350**	**77.2**	**65,085**	**86.9**	**156,949**	**70.2**	**761,646**	**91.6**

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 31 December 2018, by DHB.

DHB	Number of women screened in last 3 years		% of population aged 15-19 years screened
	Aged 10-20 years	Aged 15-19 years	
Auckland	439	439	2.7
Bay of Plenty	223	223	3.2
Canterbury	916	914	5.2
Capital & Coast	384	384	3.5
Counties Manukau	354	354	1.9
Hawke's Bay	160	160	3.1
Hutt Valley	117	116	2.6
Lakes	87	86	2.5
Mid Central	139	139	2.3
Nelson Marlborough	139	139	3.4
Northland	91	91	1.8
South Canterbury	61	61	3.9
Southern	457	457	3.9
Tairawhiti	30	30	1.9
Taranaki	125	125	3.7
Waikato	381	380	2.8
Wairarapa	41	41	3.3
Waitemata	680	678	3.6
West Coast	40	40	5.1
Whanganui	55	55	2.9
Unspecified	-	-	-
Total	**4,919**	**4,912**	**3.2**

Table 33 - Women screened under 20 years of age, as a proportion of all women screened in the three years to 31 December 2018, by DHB

DHB	Women screened in last 3 years		Proportion of women screened who were aged < 20 years (%)
	Aged < 20 years	All ages	
Auckland	439	115,347	0.4
Bay of Plenty	223	53,382	0.4
Canterbury	916	120,182	0.8
Capital & Coast	384	75,004	0.5
Counties Manukau	354	110,887	0.3
Hawke's Bay	160	34,494	0.5
Hutt Valley	117	32,610	0.4
Lakes	87	23,729	0.4
Mid Central	139	36,804	0.4
Nelson Marlborough	139	33,983	0.4
Northland	91	35,021	0.3
South Canterbury	61	12,550	0.5
Southern	457	73,275	0.6
Tairawhiti	30	10,203	0.3
Taranaki	125	27,188	0.5
Waikato	381	88,728	0.4
Wairarapa	41	9,377	0.4
Waitemata	680	132,488	0.5
West Coast	40	6,786	0.6
Whanganui	55	13,067	0.4
Unspecified	-	-	-
Total	**4,919**	**1,045,105**	**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 31 December 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	439	407	92.7
Bay of Plenty	223	208	93.3
Canterbury	916	801	87.4
Capital & Coast	384	368	95.8
Counties Manukau	354	312	88.1
Hawke's Bay	160	138	86.3
Hutt Valley	117	105	89.7
Lakes	87	79	90.8
Mid Central	139	133	95.7
Nelson Marlborough	139	123	88.5
Northland	91	77	84.6
South Canterbury	61	50	82.0
Southern	457	412	90.2
Tairawhiti	30	24	80.0
Taranaki	125	114	91.2
Waikato	381	351	92.1
Wairarapa	41	37	90.2
Waitemata	680	599	88.1
West Coast	40	35	87.5
Whanganui	55	49	89.1
Unspecified	-	-	-
Total	**4,919**	**4,422**	**89.9**

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

DHB	Estimated hysterectomy prevalence (%)		
	Report 50	Report 49	Report 48
20-24	0.021%	0.016%	0.344%
25-29	0.172%	0.171%	0.913%
30-34	0.782%	0.781%	1.789%
35-39	2.403%	2.406%	3.503%
40-44	5.446%	5.447%	6.561%
45-49	8.493%	8.494%	10.030%
50-54	12.136%	12.135%	13.283%
55-59	14.428%	14.428%	17.529%
60-64	18.283%	18.282%	23.689%
65-69	21.919%	21.916%	29.103%

Based on estimates from Cleary and Wright[1] (Reports 49 and 50) and Gray[2] (Report 48).

Table 36 - Women (25-69 years) screened in the three years to 31 December 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)	(no hysterectomy adjustment)
Auckland	66.8	62.0
Bay of Plenty	78.6	71.1
Canterbury	72.7	66.2
Capital & Coast	75.7	69.5
Counties Manukau	67.4	62.0
Hawke's Bay	73.1	65.9
Hutt Valley	73.7	67.3
Lakes	76.1	69.1
Mid Central	72.1	65.4
Nelson Marlborough	77.8	69.8
Northland	69.8	62.8
South Canterbury	74.0	66.4
Southern	76.0	69.0
Tairawhiti	74.1	67.3
Taranaki	78.9	71.5
Waikato	73.9	67.3
Wairarapa	71.1	63.9
Waitemata	70.0	64.1
West Coast	72.0	64.9
Whanganui	72.2	65.2
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 30 Jun 2017	To 31 Dec 2017	To 30 Jun 2018	To 31 Dec 2018
Auckland	77.4%	70.6%	67.6%	66.8%
Bay of Plenty	81.1%	80.3%	78.4%	78.6%
Canterbury	74.5%	73.7%	72.4%	72.7%
Capital & Coast	79.3%	78.3%	75.6%	75.7%
Counties Manukau	73.2%	71.8%	68.0%	67.4%
Hawke's Bay	75.9%	76.3%	73.0%	73.1%
Hutt Valley	76.7%	76.0%	73.4%	73.7%
Lakes	78.1%	77.0%	76.1%	76.1%
Mid Central	74.9%	73.9%	71.8%	72.1%
Nelson Marlborough	80.0%	80.4%	77.7%	77.8%
Northland	73.0%	71.8%	69.4%	69.8%
South Canterbury	76.2%	76.9%	75.1%	74.0%
Southern	79.9%	78.5%	75.3%	76.0%
Tairawhiti	74.3%	75.8%	73.7%	74.1%
Taranaki	78.9%	81.0%	78.8%	78.9%
Waikato	76.5%	75.6%	73.3%	73.9%
Wairarapa	73.6%	75.2%	71.1%	71.1%
Waitemata	75.2%	73.4%	70.0%	70.0%
West Coast	71.1%	75.3%	72.2%	72.0%
Whanganui	74.8%	75.1%	72.5%	72.2%
Total	**76.4%**	**74.8%**	**72.1%**	**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 30 Jun 2017	To 31 Dec 2017	To 30 Jun 2018	To 31 Dec 2018
20-24	50.3%	47.5%	45.9%	45.1%
25-29	65.0%	60.8%	58.9%	58.4%
30-34	72.1%	69.4%	67.6%	67.1%
35-39	77.8%	76.1%	74.1%	74.2%
40-44	79.9%	78.7%	77.2%	77.1%
45-49	81.0%	80.5%	78.3%	78.5%
50-54	80.1%	79.5%	77.9%	78.1%
55-59	79.6%	79.4%	76.2%	76.4%
60-64	79.3%	79.1%	73.6%	74.0%
65-69	75.2%	75.8%	68.9%	69.4%
Total	**73.3%**	**71.6%**	**69.0%**	**69.0%**

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 30 Jun 2017	To 31 Dec 2017	To 30 Jun 2018	To 31 Dec 2018
Māori	64.0%	62.0%	61.8%	62.1%
Pacific	74.3%	73.4%	68.6%	67.3%
Asian	67.2%	63.4%	59.1%	59.9%
European/ Other	81.1%	80.4%	78.0%	77.9%
Total	**76.4%**	**74.8%**	**72.1%**	**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 1.2 – Regularity of screening

Table 40 - Routine (3-yearly) repeat screening interval (number of cytology tests), by ethnicity, 2014-2018

	Māori women			Pacific women			Asian women			European/ Other women		
Quarter	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late
Jan-Mar 2014	1,009	2,757	1,628	325	1,218	799	1,069	2,994	1,048	7,680	24,061	8,764
Apr-Jun 2014	949	3,000	1,749	343	1,309	780	1,212	3,309	1,034	7,980	25,862	8,811
Jul-Sep 2014	1,004	3,130	1,721	306	1,445	774	1,050	3,710	1,144	7,503	27,795	8,673
Oct-Dec 2014	850	2,985	1,686	330	1,389	788	975	3,226	1,050	6,948	26,676	8,058
Jan-Mar 2015	969	2,869	1,836	313	1,334	823	1,072	3,323	1,202	7,560	26,267	9,121
Apr-Jun 2015	994	3,259	2,057	311	1,535	984	1,145	3,870	1,443	7,719	28,496	9,885
Jul-Sep 2015	879	3,560	2,061	311	1,513	855	1,043	3,799	1,131	7,028	29,250	9,055
Oct-Dec 2015	847	3,318	1,903	336	1,500	924	933	3,610	1,152	6,773	27,765	9,138
Jan-Mar 2016	927	3,012	1,898	312	1,400	1,005	1,025	3,549	1,206	7,185	26,610	9,110
Apr-Jun 2016	888	3,262	2,130	319	1,547	1,077	1,023	4,042	1,371	7,021	28,445	9,606
Jul-Sep 2016	785	3,280	2,016	278	1,524	845	974	4,342	1,234	6,317	29,343	9,247
Oct-Dec 2016	657	2,797	1,753	226	1,318	721	783	3,463	1,139	5,696	25,727	8,480
Jan-Mar 2017	821	2,994	1,906	294	1,370	863	926	3,780	1,335	6,534	26,762	9,673
Apr-Jun 2017	781	3,304	2,027	277	1,482	909	949	4,160	1,467	6,118	27,857	9,827
Jul-Sep 2017	740	3,393	2,080	253	1,463	924	927	4,534	1,506	5,672	28,502	9,719
Oct-Dec 2017	610	3,101	2,052	241	1,326	815	737	3,988	1,373	5,117	27,158	9,473
Jan-Mar 2018	817	3,555	2,298	265	1,386	954	888	4,020	1,542	6,178	28,372	10,984
Apr-Jun 2018	838	3,795	2,334	273	1,505	1,086	916	4,663	1,690	5,823	30,242	10,810
Jul-Sep 2018	738	4,095	2,573	284	1,633	997	893	4,882	1,866	5,385	30,643	10,564
Oct-Dec 2018	601	3,518	2,065	210	1,436	891	825	4,286	1,619	4,949	28,397	9,659

Table 41 - Routine (3-yearly) repeat screening interval (number of cytology tests), by age, 2014-2018

	20-29			30-39			40-49			50-59			60-69		
Quarter	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late
Jan-Mar 2014	1,774	2,927	1,324	2,351	5,866	3,392	2,739	8,477	3,395	2,146	8,113	2,614	1,073	5,647	1,514
Apr-Jun 2014	1,747	2,929	1,291	2,423	6,271	3,304	2,863	9,034	3,568	2,310	8,952	2,753	1,141	6,294	1,458
Jul-Sep 2014	1,708	3,005	1,308	2,164	6,486	3,372	2,727	9,830	3,488	2,173	9,864	2,713	1,091	6,895	1,431
Oct-Dec 2014	1,521	2,793	1,178	1,981	6,019	3,212	2,519	9,211	3,301	2,032	9,451	2,505	1,050	6,802	1,386
Jan-Mar 2015	1,833	3,051	1,381	2,289	6,347	3,591	2,572	9,023	3,697	2,151	8,958	2,829	1,069	6,414	1,484
Apr-Jun 2015	1,709	3,156	1,415	2,379	6,778	3,846	2,718	10,003	4,130	2,239	9,983	3,151	1,124	7,240	1,827
Jul-Sep 2015	1,515	3,245	1,345	2,133	6,944	3,618	2,495	10,222	3,732	2,061	10,471	2,912	1,057	7,240	1,495
Oct-Dec 2015	1,447	3,230	1,368	1,934	6,366	3,521	2,418	9,678	3,724	2,055	9,712	2,977	1,035	7,207	1,527
Jan-Mar 2016	1,803	3,235	1,413	2,296	6,802	3,701	2,393	9,049	3,732	1,957	8,997	2,822	1,000	6,488	1,551
Apr-Jun 2016	1,570	3,324	1,453	2,196	6,802	3,767	2,467	9,683	4,014	2,028	9,965	3,218	990	7,522	1,732
Jul-Sep 2016	1,393	3,268	1,349	1,911	7,003	3,599	2,166	10,103	3,829	1,905	10,474	2,934	979	7,641	1,631
Oct-Dec 2016	1,202	2,845	1,221	1,617	5,954	3,210	1,957	8,545	3,304	1,704	9,068	2,757	882	6,893	1,601
Jan-Mar 2017	1,553	3,263	1,448	1,968	6,587	3,688	2,226	9,014	3,829	1,910	9,255	3,014	918	6,787	1,798
Apr-Jun 2017	1,382	3,320	1,445	1,852	6,820	3,696	2,171	9,434	3,951	1,789	9,921	3,243	931	7,308	1,895
Jul-Sep 2017	1,183	3,362	1,464	1,856	6,957	3,751	1,985	9,779	3,849	1,685	10,324	3,296	883	7,470	1,869
Oct-Dec 2017	1,056	3,120	1,375	1,432	6,334	3,651	1,811	8,954	3,775	1,583	9,630	3,127	823	7,535	1,785
Jan-Mar 2018	1,401	3,585	1,577	1,910	7,281	4,269	2,109	9,495	4,222	1,834	9,806	3,537	894	7,166	2,173
Apr-Jun 2018	1,271	3,665	1,559	1,803	7,527	4,037	2,106	10,198	4,338	1,785	10,687	3,678	885	8,128	2,308
Jul-Sep 2018	1,141	3,658	1,521	1,727	7,614	4,121	1,941	10,498	4,289	1,676	11,218	3,827	815	8,265	2,242
Oct-Dec 2018	990	3,318	1,401	1,479	6,889	3,539	1,730	9,332	3,842	1,574	10,235	3,428	812	7,863	2,024

Table 42 - 12 month repeat screening interval (number of cytology tests), by ethnicity, 2014-2018

	Māori women			Pacific women			Asian women			European/ Other women		
Quarter	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late
Jan-Mar 2014	173	1,366	2,597	53	499	1,192	98	1,369	1,654	777	8,969	10,560
Apr-Jun 2014	144	1,396	2,601	39	565	1,096	99	1,482	1,689	759	9,302	10,062
Jul-Sep 2014	99	1,466	2,503	30	559	1,033	81	1,751	1,722	649	9,491	10,216
Oct-Dec 2014	103	1,286	2,535	35	504	1,118	82	1,395	1,719	616	8,739	9,680
Jan-Mar 2015	125	1,268	2,734	36	485	1,178	120	1,379	1,954	766	8,402	10,522
Apr-Jun 2015	116	1,373	2,675	40	530	1,283	114	1,538	2,111	692	8,552	10,294
Jul-Sep 2015	107	1,447	2,707	34	563	1,111	71	1,521	1,914	579	8,865	9,793
Oct-Dec 2015	107	1,336	2,693	29	568	1,301	78	1,452	1,861	562	8,441	9,501
Jan-Mar 2016	127	1,303	2,681	38	550	1,289	92	1,451	1,866	661	7,907	9,902
Apr-Jun 2016	125	1,413	2,589	41	605	1,252	102	1,527	1,950	610	8,436	9,445
Jul-Sep 2016	76	1,315	2,513	24	585	1,138	61	1,687	1,994	505	8,176	9,316
Oct-Dec 2016	70	1,167	2,281	28	478	962	53	1,401	1,728	442	7,373	8,409
Jan-Mar 2017	93	1,214	2,232	34	515	1,000	82	1,463	1,982	510	7,310	9,212
Apr-Jun 2017	76	1,195	2,415	30	488	1,065	76	1,581	2,050	462	7,245	8,733
Jul-Sep 2017	58	1,175	2,546	18	492	1,126	68	1,652	2,210	371	7,195	8,872
Oct-Dec 2017	57	1,008	2,480	18	369	978	59	1,430	1,979	353	6,427	8,525
Jan-Mar 2018	67	1,053	2,657	32	396	1,073	78	1,348	2,093	426	6,271	9,609
Apr-Jun 2018	68	1,083	2,573	22	413	1,079	62	1,530	2,094	428	6,319	9,201
Jul-Sep 2018	61	1,163	2,743	24	445	1,096	59	1,757	2,294	351	6,601	8,718
Oct-Dec 2018	53	1,075	2,328	18	381	985	62	1,549	2,027	329	6,170	7,988

Table 43 - 12 month repeat screening interval (number of cytology tests), by age, 2014-2018

	20-29			30-39			40-49			50-59			60-69		
Quarter	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late	Early	On-time	Late
Jan-Mar 2014	467	3,974	4,866	253	2,505	4,121	194	2,547	3,542	124	2,023	2,354	63	1,154	1,120
Apr-Jun 2014	459	4,041	4,530	216	2,630	4,018	157	2,768	3,462	128	2,062	2,284	81	1,244	1,154
Jul-Sep 2014	330	4,296	4,755	204	2,677	4,017	160	2,748	3,477	109	2,251	2,173	56	1,295	1,052
Oct-Dec 2014	336	3,958	4,550	166	2,354	3,842	150	2,325	3,310	108	2,072	2,261	76	1,215	1,089
Jan-Mar 2015	457	4,096	5,097	238	2,329	4,198	153	2,189	3,627	129	1,785	2,320	70	1,135	1,146
Apr-Jun 2015	398	4,103	4,829	220	2,488	4,136	170	2,351	3,655	106	1,876	2,506	68	1,175	1,237
Jul-Sep 2015	326	4,277	4,869	169	2,551	3,926	128	2,377	3,395	107	2,011	2,294	61	1,180	1,041
Oct-Dec 2015	341	4,134	4,728	160	2,300	4,019	120	2,266	3,219	101	1,916	2,278	54	1,181	1,112
Jan-Mar 2016	406	4,062	5,074	206	2,316	4,099	144	2,100	3,255	100	1,664	2,224	62	1,069	1,086
Apr-Jun 2016	384	4,184	4,644	182	2,481	4,012	153	2,313	3,182	104	1,793	2,232	55	1,210	1,166
Jul-Sep 2016	257	4,139	4,578	178	2,454	3,994	116	2,234	3,233	76	1,785	2,120	39	1,151	1,036
Oct-Dec 2016	223	3,689	4,090	149	2,178	3,493	105	1,919	2,830	69	1,597	1,969	47	1,036	998
Jan-Mar 2017	301	3,980	4,543	166	2,301	3,697	124	1,865	3,031	85	1,433	2,047	43	923	1,108
Apr-Jun 2017	266	3,897	4,457	157	2,284	3,775	114	1,797	2,792	69	1,507	2,112	38	1,024	1,127
Jul-Sep 2017	208	3,912	4,667	131	2,304	3,917	89	1,894	3,015	56	1,452	2,079	31	952	1,076
Oct-Dec 2017	195	3,539	4,505	117	1,956	3,585	89	1,566	2,736	47	1,334	2,023	39	839	1,113
Jan-Mar 2018	270	3,555	4,998	140	2,020	4,204	105	1,513	3,089	54	1,204	2,017	34	776	1,124
Apr-Jun 2018	237	3,574	4,588	136	2,137	4,123	96	1,540	2,985	68	1,253	2,003	43	841	1,248
Jul-Sep 2018	205	3,897	4,513	113	2,248	4,075	93	1,623	2,990	54	1,278	2,118	30	920	1,155
Oct-Dec 2018	171	3,598	4,083	105	2,015	3,714	92	1,540	2,629	53	1,208	1,845	41	814	1,057

Table 44 - Timeliness of re-attendance in 2014 and 2018 following a routine (3-year) repeat screening recommendation, by ethnicity

Ethnicity	2018			2014		
	Early	On-time	Late	Early	On-time	Late
Māori	11.0%	55.0%	34.0%	17.0%	52.8%	30.2%
Pacific	9.5%	54.6%	36.0%	13.3%	54.7%	32.0%
Asian	12.5%	63.5%	23.9%	19.7%	60.7%	19.6%
European/ Other	12.3%	64.6%	23.1%	17.8%	61.8%	20.3%

Table 45 - Timeliness of re-attendance in 2014 and 2018 following a routine (3-year) repeat screening recommendation, by age

Age	2018			2014		
	Early	On-time	Late	Early	On-time	Late
20-29	19.1%	56.7%	24.1%	28.7%	49.6%	21.7%
30-39	13.3%	56.2%	30.6%	19.0%	52.6%	28.4%
40-49	12.3%	61.7%	26.0%	17.7%	59.8%	22.5%
50-59	10.9%	66.3%	22.9%	15.6%	65.4%	19.0%
60-69	7.8%	72.1%	20.1%	12.2%	71.7%	16.2%

Indicator 2 – First screening events

Table 46 - Age distribution of first screening events for period 1 July – 31 December 2018

Age	Women with first events	% of first events (ages 20-69 yrs) which occurred in that age group
20-24	10,163	42.5
25-29	4,623	19.3
30-34	3,530	14.8
35-39	2,098	8.8
40-44	1,181	4.9
45-49	769	3.2
50-54	507	2.1
55-59	380	1.6
60-64	418	1.7
65-69	250	1.0
20-69 yrs	**23,919**	**100.0**

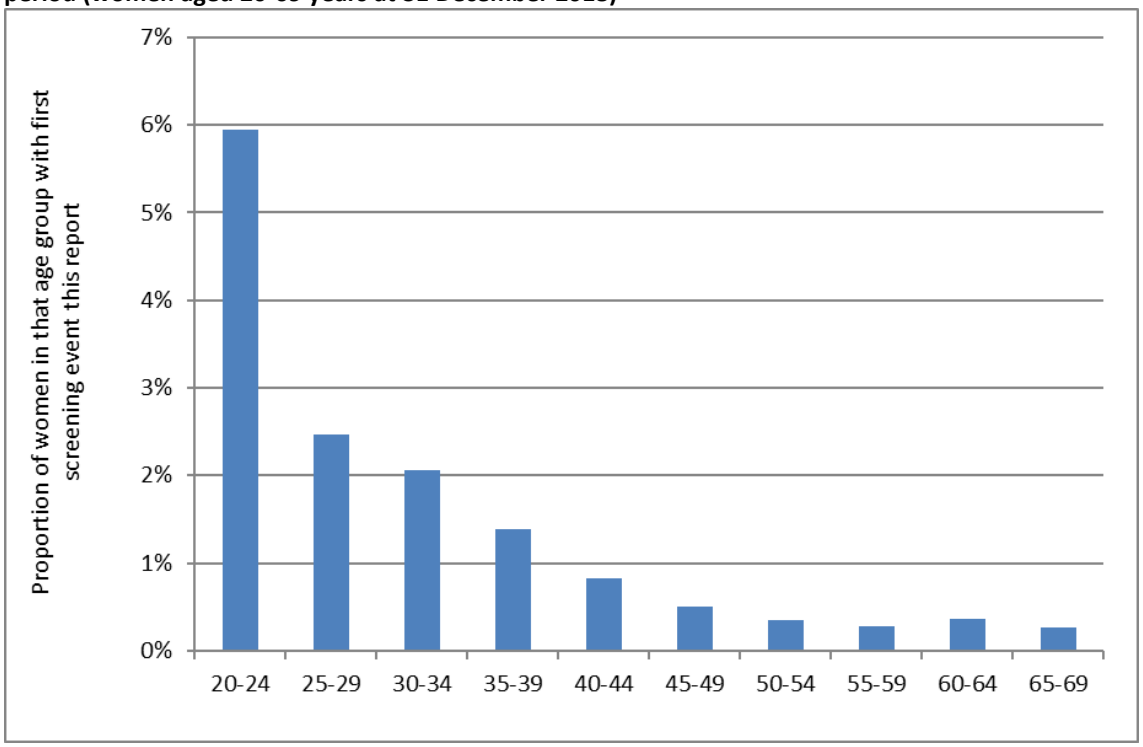
Percentage = number of first screens in age group divided by total number of first screens x 100.

Table 47 - Women (ages 20-69 years) with first screening events as a proportion of total number of women with screening events 1 July – 31 December 2018

Age	Women with first events	As a proportion of women with a screening event	
		N	%
20-24	10,163	22,285	45.6
25-29	4,623	24,053	19.2
30-34	3,530	24,645	14.3
35-39	2,098	23,066	9.1
40-44	1,181	22,230	5.3
45-49	769	24,215	3.2
50-54	507	22,144	2.3
55-59	380	20,810	1.8
60-64	418	16,794	2.5
65-69	250	12,426	2.0
20-69 yrs	**23,919**	**212,668**	**11.2**

Percentage = number of first screens in age group divided by all women with a screening event within that age group (first or subsequent events) x 100.

Figure 124 - Proportion of population* in that age group with their first screening event during the monitoring period (women aged 20-69 years at 31 December 2018)



**Hysterectomy adjusted, 2013 Census data projected to 31 December 2018.*

Table 48 - 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 DHB, for period 1 July – 31 December 2018

DHB	Women with first events	As a proportion of women with a screening event		As a proportion of eligible population	
	N	N	%	N	%
Auckland	3,567	24,174	14.8	182,246	2.0
Bay of Plenty	900	10,503	8.6	67,615	1.3
Canterbury	2,740	24,518	11.2	166,968	1.6
Capital & Coast	1,991	15,005	13.3	101,701	2.0
Counties Manukau	3,030	21,639	14.0	170,576	1.8
Hawke's Bay	582	7,095	8.2	46,756	1.2
Hutt Valley	588	6,418	9.2	44,791	1.3
Lakes	435	4,722	9.2	31,658	1.4
Mid Central	733	7,847	9.3	52,202	1.4
Nelson Marlborough	546	6,566	8.3	42,829	1.3
Northland	605	7,365	8.2	50,036	1.2
South Canterbury	178	2,368	7.5	16,590	1.1
Southern	1,776	15,349	11.6	97,777	1.8
Tairawhiti	169	2,093	8.1	13,839	1.2
Taranaki	372	5,154	7.2	33,950	1.1
Waikato	2,013	18,528	10.9	121,193	1.7
Wairarapa	132	1,880	7.0	12,856	1.0
Waitemata	3,257	27,426	11.9	192,900	1.7
West Coast	80	1,272	6.3	9,263	0.9
Whanganui	225	2,746	8.2	17,945	1.3
Total	**23,919**	**212,668**	**11.2**	**1,473,691**	**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 31 December 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 49 - 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 July – 31 December 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	2,551	25,893	9.9	206,257	1.2
Pacific	1,675	10,951	15.3	89,758	1.9
Asian	7,323	31,428	23.3	252,777	2.9
European/ Other	12,370	144,396	8.6	924,899	1.3
Total	**23,919**	**212,668**	**11.2**	**1,473,691**	**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 31 December 2018 for that ethnicity group, as a percent.

Table 50 - Median age of women with a first screening event, by ethnicity, for period 1 July – 31 December 2018

Ethnic Group	Median Age	Mean Age
Māori	22	24.7
Pacific	25	29.0
Asian	31	33.9
European/ Other	24	28.0

Indicator 3 – Withdrawal rates

Table 51 - Number of women (aged 20-69 years) who withdrew from the NCSP Register 1 July – 31 December 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	203,513	3	0.001
Pacific	103,259	-	0.000
Asian	204,273	1	0.000
European/ Other	1,104,768	11	0.001
Total	**1,615,813**	**15**	**0.001**

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

Table 52 - Number of women who withdrew from the NCSP Register 1 January July – 30 June31 December 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	757	-	0
20-24	72,061	1	0.001
25-29	144,944	1	0.001
30-34	171,044	1	0.001
35-39	181,338	1	0.001
40-44	184,405	1	0.001
45-49	205,966	1	0.000
50-54	193,267	1	0.001
55-59	186,051	2	0.001
60-64	153,098	3	0.002
65-69	123,639	3	0.002
70+	289,635	-	<0.001
Total (all ages)	**1,906,205**	**15**	**0.001**
Total (20-69)	**1,615,813**	**15**	**0.001**

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

Indicator 4 – Early re-screening

Table 53 - Early re-screening by DHB

DHB	Women recommended to return in 3 years	Women with >1 subsequent test	
	N	N	%
Auckland	5,014	666	13.3
Bay of Plenty	2,399	339	14.1
Canterbury	5,725	775	13.5
Capital & Coast	3,459	295	8.5
Counties Manukau	5,016	485	9.7
Hawke's Bay	1,599	176	11.0
Hutt Valley	1,502	129	8.6
Lakes	1,083	131	12.1
Mid Central	1,526	121	7.9
Nelson Marlborough	1,692	165	9.8
Northland	1,507	151	10.0
South Canterbury	646	83	12.8
Southern	3,234	367	11.3
Tairawhiti	415	29	7.0
Taranaki	1,188	117	9.8
Waikato	3,833	309	8.1
Wairarapa	491	69	14.1
Waitemata	6,062	1,000	16.5
West Coast	320	41	12.8
Whanganui	544	45	8.3
Unspecified	-	-	0.0
Total	**47,255**	**5,493**	**11.6**

Table 54 - Early re-screening by five-year age group

Age	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
20-24	1,209	189	15.6
25-29	4,504	596	13.2
30-34	5,060	676	13.4
35-39	5,453	674	12.4
40-44	5,651	676	12.0
45-49	6,364	788	12.4
50-54	5,807	679	11.7
55-59	5,467	555	10.2
60-64	4,366	404	9.3
65-69	3,374	256	7.6
All ages	**47,255**	**5,493**	**11.6**

Table 55 - Early re-screening by ethnicity

Ethnicity	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
Māori	5,116	556	10.9
Pacific	2,389	181	7.6
Asian	5,582	596	10.7
European/ Other	34,168	4,160	12.2
Total	**47,255**	**5,493**	**11.6**

Indicator 5 – Laboratory indicators

Indicator 5.1 – Laboratory cytology reporting

Table 56 - Age-standardised percentage of satisfactory smears reported as HSIL, by laboratory

Laboratory	% satisfactory smears reported as HSIL	
	Age-standardised rate* (20-69 years)	Crude rate
Anatomical Pathology Services	0.57%	0.61%
Canterbury Health Laboratories	0.83%	0.89%
LabPLUS	2.08%	2.26%
Medlab Central Ltd.	1.17%	1.19%
Pathlab	0.39%	0.41%
Southern Community Laboratories	0.75%	0.79%
Total	**0.75%**	**0.79%**

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

Indicator 5.2 – Accuracy of cytology predicting HSIL

Table 57 - Positive predictive value of a report of HSIL + SC cytology by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	191	91.8	142	74.3	17	8.2	208
Canterbury Health Laboratories	53	91.4	42	79.2	5	8.6	58
LabPLUS	22	88.0	15	68.2	3	12.0	25
Medlab Central Ltd.	111	89.5	96	86.5	13	10.5	124
Pathlab	81	92.0	68	84.0	7	8.0	88
Southern Community Laboratories	572	92.9	457	79.9	44	7.1	616
Total	**1,030**	**92.0**	**820**	**79.6**	**89**	**8.0**	**1,119**

Target: 65% - 85%.

Table 58 - Positive predictive value of a report of ASC-H cytology by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	115	85.8	53	46.1	19	14.2	134
Canterbury Health Laboratories	50	94.3	30	60.0	3	5.7	53
LabPLUS	40	74.1	16	40.0	14	25.9	54
Medlab Central Ltd.	79	79.8	48	60.8	20	20.2	99
Pathlab	96	88.1	52	54.2	13	11.9	109
Southern Community Laboratories	130	82.8	67	51.5	27	17.2	157
Total	**510**	**84.2**	**266**	**52.2**	**96**	**15.8**	**606**

Table 59 - Positive predictive value of a report of ASC-H + HSIL + SC cytology by laboratory

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Anatomical Pathology Services	306	89.5	195	63.7	36	10.5	342
Canterbury Health Laboratories	103	92.8	72	69.9	8	7.2	111
LabPLUS	62	78.5	31	50.0	17	21.5	79
Medlab Central Ltd.	190	85.2	144	75.8	33	14.8	223
Pathlab	177	89.8	120	67.8	20	10.2	197
Southern Community Laboratories	702	90.8	524	74.6	71	9.2	773
Total	**1,540**	**89.3**	**1,086**	**70.5**	**185**	**10.7**	**1,725**

Indicator 5.4 – Histology Reporting

Figure 125 - Trends in histologically-confirmed HSIL as a percentage of all women with histology (To 1 July – 31 December 2018).

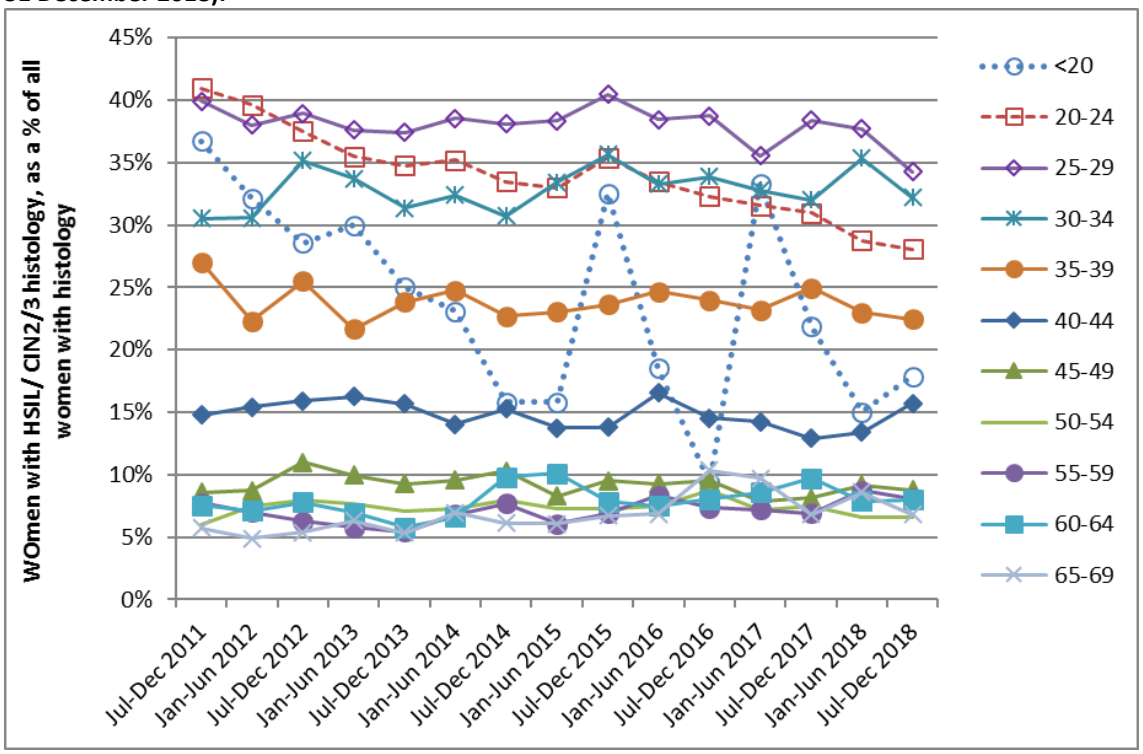


Table 60 - Rate of women with CIN 2/3 per 1,000 women screened, by age and ethnicity and for NZ overall, 1 July – 31 December 2018

DHB	Ethnicity				NZ overall
	Māori	Pacific	Asian	European/ Other	
<20	0.0	0.0	0.0	15.2	11.2
20-24	12.8	9.6	6.4	15.3	13.8
25-29	22.1	10.5	6.8	21.6	18.4
30-34	24.7	12.2	9.3	18.2	16.8
35-39	13.4	9.9	9.0	11.6	11.1
40-44	12.6	8.8	5.6	8.8	8.8
45-49	5.7	4.4	5.2	5.1	5.2
50-54	4.9	1.7	2.5	3.1	3.2
55-59	4.1	2.3	2.3	3.0	3.0
60-64	6.5	3.1	2.0	2.0	2.4
65-69	1.1	0.0	2.6	2.2	2.1
70+	16.9	12.7	0.0	4.9	5.5
ASR (20-69 years)^	**12.5**	**7.3**	**5.8**	**10.8**	**10.0**

^Age Standardised to the WHO population (ages 20-69 years)[13].

Table 61 - Rate of women, per 1,000 women screened, with CIN 2/3 histology, by age and ethnicity, Jan-Jun 2009 to Jun-Jul 2018

		Period																			
Ethnicity	Age Group	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	Jun-Jul 2018
Māori	<20	21.3	20.5	8.5	19.3	14.2	24.0	19.9	12.2	0.0	0.0	0.0	14.3	7.1	8.0	7.6	0.0	20.6	0.0	10.4	0.0
Māori	20-24	29.2	31.6	25.4	28.1	23.4	31.4	32.2	29.4	27.7	30.1	25.0	24.1	19.6	20.7	21.3	19.4	20.2	16.5	14.3	12.8
Māori	25-29	32.3	31.7	28.4	28.0	30.3	34.3	33.8	41.3	37.9	38.2	37.4	40.1	32.4	31.9	28.5	35.1	25.6	28.7	22.1	22.1
Māori	30-34	20.7	19.1	24.4	30.7	26.9	21.9	27.4	34.7	31.0	30.1	28.7	25.2	31.8	30.4	23.0	30.0	25.2	26.9	23.7	24.7
Māori	35-39	16.3	16.2	19.3	17.1	15.1	17.3	16.8	13.5	18.0	20.5	17.4	17.5	17.1	21.8	17.4	19.7	20.5	19.2	11.9	13.4
Māori	40-44	9.1	9.0	10.5	10.0	12.2	11.2	11.1	9.8	10.2	12.9	10.2	14.0	12.4	11.1	15.4	14.7	14.3	8.5	8.4	12.6
Māori	45-49	11.6	9.1	5.1	8.2	6.1	7.0	6.4	6.0	9.1	7.4	7.2	9.5	9.1	10.4	5.9	8.1	5.5	7.7	7.3	5.7
Māori	50-54	6.5	2.4	4.5	5.0	4.5	2.2	7.2	8.5	6.0	3.9	5.1	8.1	8.0	5.0	5.0	8.3	4.0	4.3	4.1	4.9
Māori	55-59	3.3	5.3	0.7	4.1	2.6	8.4	4.5	4.3	3.1	1.8	3.5	2.9	3.2	2.5	4.2	3.3	3.2	4.5	6.1	4.1
Māori	60-64	4.9	2.2	4.6	2.8	2.0	4.0	3.9	2.7	3.7	2.7	5.2	9.3	7.8	3.8	6.1	4.6	2.4	3.0	2.7	6.5
Māori	65-69	1.9	3.8	5.6	1.7	1.7	3.4	0.0	6.5	6.3	1.6	1.4	1.4	3.8	6.3	3.8	12.3	1.2	1.2	1.1	1.1
Māori	70+	0.0	0.0	0.0	0.0	0.0	8.0	7.5	7.4	8.5	17.5	13.3	0.0	0.0	7.8	8.9	0.0	0.0	7.8	14.6	16.9
Pacific	<20	11.6	7.2	0.0	0.0	0.0	0.0	10.3	0.0	0.0	27.0	21.3	0.0	0.0	0.0	0.0	0.0	47.6	0.0	0.0	0.0
Pacific	20-24	11.1	12.9	13.7	15.1	11.7	10.8	14.5	17.0	13.5	14.0	7.5	8.5	10.2	12.0	7.8	10.2	7.1	5.0	10.0	9.6
Pacific	25-29	6.2	7.5	8.9	16.2	16.1	13.6	13.6	15.2	13.2	14.7	16.3	23.8	17.5	12.9	13.1	15.7	16.9	16.2	9.8	10.5
Pacific	30-34	9.3	10.7	11.9	10.5	10.7	6.3	18.3	18.7	11.8	13.8	14.4	16.6	16.1	13.7	13.2	20.4	17.8	15.5	14.8	12.2
Pacific	35-39	8.8	6.6	7.2	10.2	7.1	7.4	9.6	14.3	13.5	11.7	10.0	12.5	8.0	8.5	6.6	10.5	6.3	12.4	12.2	9.9
Pacific	40-44	4.6	3.0	4.2	4.7	5.3	8.3	7.4	9.4	6.5	7.3	6.2	9.3	4.5	3.5	7.8	11.2	7.6	6.4	3.2	8.8
Pacific	45-49	7.8	4.1	3.3	4.7	4.2	4.8	7.3	8.1	5.7	3.7	4.6	4.7	4.3	5.1	5.8	6.8	3.3	3.4	5.8	4.4
Pacific	50-54	1.3	2.4	1.1	6.1	3.2	2.0	5.6	8.1	7.0	2.7	3.9	1.8	5.2	3.4	4.2	2.7	2.5	3.9	3.7	1.7
Pacific	55-59	1.6	4.3	1.4	2.7	1.4	1.5	2.7	2.8	6.5	6.4	5.4	3.3	2.1	1.2	1.0	2.3	4.7	5.5	6.7	2.3
Pacific	60-64	2.4	4.1	2.1	5.6	8.3	3.8	5.2	3.6	1.7	1.6	0.0	3.3	1.5	1.5	2.9	3.0	3.1	4.5	6.1	3.1
Pacific	65-69	0.0	0.0	0.0	0.0	3.2	3.1	2.8	0.0	2.6	5.0	2.4	2.5	2.3	0.0	2.2	7.0	7.1	4.7	2.2	0.0
Pacific	70+	15.9	15.6	15.6	13.2	0.0	0.0	0.0	0.0	0.0	17.5	0.0	0.0	15.4	0.0	0.0	12.7	15.4	14.1	14.9	12.7
Asian	<20	13.3	18.9	0.0	20.4	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	0.0
Asian	20-24	4.9	8.8	5.7	6.9	7.8	6.6	9.1	14.2	10.7	9.7	9.1	12.1	5.9	10.1	12.9	11.9	10.4	7.0	6.9	6.4
Asian	25-29	9.4	6.6	6.3	6.8	8.9	10.7	8.1	12.9	9.8	8.1	8.7	11.4	7.6	13.8	11.6	11.4	5.0	7.2	5.9	6.8
Asian	30-34	6.5	6.7	9.3	7.9	9.5	14.5	9.4	11.6	9.8	10.0	9.4	7.6	9.4	10.9	12.5	10.8	8.6	9.9	7.5	9.3
Asian	35-39	8.7	6.7	7.5	10.6	9.7	10.9	7.7	12.5	7.8	10.4	10.3	8.0	8.9	6.6	7.8	9.7	7.4	6.7	9.3	9.0
Asian	40-44	5.3	4.1	8.1	8.8	5.4	5.8	8.7	11.7	9.3	9.5	4.9	9.8	5.2	7.8	9.7	8.8	5.7	4.3	7.2	5.6

Ethnicity	Age Group	Period																			
		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	Jun-Jul 2018
Asian	45-49	4.3	4.8	3.5	6.2	4.4	5.6	2.2	9.9	6.0	4.6	6.5	6.1	4.4	6.4	5.6	4.7	4.3	4.5	4.2	5.2
Asian	50-54	1.2	3.6	3.2	2.5	3.5	2.4	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	2.5
Asian	55-59	3.6	2.4	4.0	1.5	6.4	6.3	3.8	4.2	2.3	3.2	2.8	3.9	3.3	1.0	2.0	4.3	1.9	3.2	3.7	2.3
Asian	60-64	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	5.7	2.8	4.1	3.8	2.2	2.0
Asian	65-69	0.0	2.3	2.2	8.3	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	2.6
Asian	70+	0.0	10.5	0.0	0.0	0.0	0.0	0.0	10.8	9.5	28.6	0.0	0.0	9.3	8.4	0.0	0.0	0.0	0.0	7.4	0.0
Eur/Other	<20	18.6	23.6	7.9	11.5	11.7	19.8	19.7	17.6	21.8	16.6	11.9	6.9	8.8	24.8	6.8	7.7	16.9	17.8	4.8	15.2
Eur/Other	20-24	28.2	26.2	24.6	25.7	28.5	27.4	31.2	28.5	26.7	24.2	23.3	22.2	20.3	21.6	20.1	20.8	18.4	17.7	15.0	15.3
Eur/Other	25-29	27.5	25.4	25.1	27.1	27.3	30.1	29.2	30.5	31.2	33.0	30.0	30.0	28.0	31.3	30.3	28.3	24.1	23.7	21.8	21.6
Eur/Other	30-34	16.4	17.8	16.4	20.4	19.6	17.6	18.2	22.5	22.2	21.0	21.4	21.5	19.3	22.4	21.8	22.3	20.1	18.7	20.0	18.2
Eur/Other	35-39	10.6	9.9	10.1	11.9	10.9	12.2	11.7	14.3	10.6	12.9	12.8	13.3	11.4	12.3	13.3	13.3	11.4	14.8	10.9	11.6
Eur/Other	40-44	5.9	6.0	6.5	7.2	7.5	6.9	7.9	8.5	9.3	8.6	8.3	8.7	7.4	7.3	8.5	7.7	7.2	7.5	7.4	8.8
Eur/Other	45-49	3.7	3.9	4.5	4.6	3.5	4.4	4.6	5.5	5.3	5.8	5.3	6.0	4.5	5.0	5.6	5.9	4.1	4.2	5.2	5.1
Eur/Other	50-54	2.5	2.4	2.7	3.2	2.2	2.8	2.9	2.8	3.6	3.2	3.1	3.6	2.4	3.1	3.5	4.2	3.2	3.7	2.9	3.1
Eur/Other	55-59	1.2	1.2	1.9	1.9	1.6	1.9	2.2	2.0	2.0	1.7	2.1	2.6	1.9	2.8	3.3	2.9	2.8	2.2	2.5	3.0
Eur/Other	60-64	2.2	1.7	0.7	1.5	1.2	1.7	1.7	2.2	2.0	1.4	1.7	2.7	2.6	2.5	1.4	2.3	2.6	2.8	2.1	2.0
Eur/Other	65-69	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	1.7	1.8	2.3	2.7	2.2	2.4	2.2
Eur/Other	70+	4.9	2.4	2.6	5.0	3.8	2.0	3.0	1.7	7.9	5.1	1.8	3.6	1.9	4.5	7.6	2.6	4.2	5.5	6.2	4.9

Table 62 - Number of women screened, by age and ethnicity, Jan-Jun 2009 to Jun-Jul 2018

		Period																			
Ethnicity	Age Group	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	Jun-Jul 2018
Māori	<20	610	439	470	363	353	292	302	246	208	152	152	140	141	125	132	100	97	68	96	84
Māori	20-24	4353	4431	4575	4691	4794	4717	4538	4723	4548	4551	4435	4281	4441	4541	4364	3922	3963	3828	3977	3840
Māori	25-29	3370	3090	3308	3319	3504	3235	3288	3241	3276	3403	3393	3389	3516	3766	3750	3387	3474	3418	3706	3669
Māori	30-34	3238	2977	3069	3132	3127	3015	3031	2937	2738	2790	2790	2737	2953	2897	3001	2635	2662	2858	3210	3115
Māori	35-39	3123	3080	3156	3275	3169	3070	2864	2886	2718	2683	2697	2623	2749	2846	2700	2490	2493	2494	2767	2678
Māori	40-44	2850	2903	2856	2989	3108	3038	2962	3070	2847	2859	2737	2919	2896	2986	2722	2580	2585	2480	2754	2698
Māori	45-49	2675	2748	2769	2814	2772	2707	2667	2677	2528	2574	2636	2633	2761	2795	2728	2588	2531	2604	2864	2820
Māori	50-54	1844	2080	2020	2179	2204	2266	2229	2355	2316	2295	2371	2476	2386	2603	2413	2282	2265	2301	2431	2438
Māori	55-59	1216	1326	1402	1470	1516	1547	1558	1610	1588	1625	1708	1702	1847	2000	1907	1817	1859	2022	2146	2199
Māori	60-64	820	906	873	1054	983	1005	1019	1091	1078	1098	1148	1188	1283	1301	1318	1316	1274	1338	1472	1528
Māori	65-69	516	522	533	601	594	586	644	619	630	629	695	722	797	789	787	816	844	852	918	908
Māori	70+	118	118	129	135	118	125	134	135	117	114	150	124	135	129	112	144	128	129	137	177
Pacific	<20	172	138	132	109	127	92	97	51	60	37	47	42	37	28	28	26	21	18	12	14
Pacific	20-24	1443	1474	1535	1726	1626	1669	1725	1532	1631	1643	1592	1526	1576	1587	1789	1468	1414	1395	1296	1355
Pacific	25-29	1452	1341	1461	1416	1368	1392	1473	1318	1440	1427	1470	1431	1541	1628	1674	1463	1419	1359	1435	1433
Pacific	30-34	1503	1404	1429	1527	1406	1434	1473	1284	1355	1301	1322	1326	1432	1458	1594	1273	1234	1289	1350	1311
Pacific	35-39	1475	1365	1386	1471	1401	1355	1348	1329	1256	1283	1305	1282	1373	1410	1523	1233	1278	1205	1313	1310
Pacific	40-44	1317	1322	1416	1475	1333	1330	1347	1273	1230	1362	1292	1287	1319	1426	1417	1245	1183	1098	1234	1244
Pacific	45-49	1154	1211	1209	1286	1204	1256	1226	1238	1225	1362	1304	1266	1387	1371	1381	1181	1219	1171	1210	1147
Pacific	50-54	799	843	895	988	931	998	1062	993	998	1108	1033	1124	1152	1186	1196	1095	1184	1014	1071	1155
Pacific	55-59	609	698	704	744	690	677	741	716	769	777	747	902	935	864	953	856	856	910	894	881
Pacific	60-64	425	485	477	532	482	525	573	563	586	623	603	607	676	657	701	674	636	670	651	646
Pacific	65-69	278	287	269	292	315	318	363	359	378	397	419	406	432	462	459	430	423	428	449	469
Pacific	70+	63	64	64	76	58	57	43	55	57	57	64	64	65	77	76	79	65	71	67	79
Asian	<20	75	53	61	49	57	39	41	36	26	32	26	20	34	24	25	16	22	20	21	21
Asian	20-24	1623	1477	1587	1459	1405	1513	1536	1549	1593	1646	1654	1649	1693	1681	1712	1674	1732	1703	1744	1712
Asian	25-29	3200	3175	3310	3225	3246	3175	3327	3185	3163	3210	3089	3335	3558	3483	3798	3503	3624	3912	4042	4244
Asian	30-34	2763	2846	3015	3055	3148	3237	3523	3626	3892	4088	4161	4322	4914	4660	5022	4800	5136	5051	5332	5394
Asian	35-39	2867	2985	2929	2936	2978	2834	2971	2872	2946	3071	3101	3269	3700	3627	3864	3930	4168	4450	4725	5092

		Period																			
Ethnicity	Age Group	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	Jun-Jul 2018
Asian	40-44	2813	2892	2839	2953	2945	2916	2983	2895	2997	3045	3051	3058	3253	3063	3300	3174	3174	3291	3324	3581
Asian	45-49	2562	2689	2601	2725	2706	2660	2712	2718	2675	2810	2776	2795	2958	2833	2872	2982	3027	3080	3069	3286
Asian	50-54	1733	1924	1847	1964	1974	2077	2093	2187	2237	2389	2309	2512	2582	2518	2514	2475	2475	2467	2514	2777
Asian	55-59	1123	1262	1264	1352	1415	1577	1570	1663	1706	1877	1779	2072	2107	2025	1999	2117	2056	2178	2134	2216
Asian	60-64	684	802	851	907	914	971	960	1061	1157	1309	1270	1433	1543	1559	1570	1756	1706	1841	1785	1970
Asian	65-69	394	435	454	480	498	526	516	568	638	713	659	767	886	818	969	952	1000	1038	1032	1156
Asian	70+	86	95	93	103	87	100	98	93	105	105	111	113	107	119	93	127	132	134	135	166
Eur/Other	<20	1988	1438	1513	1217	1279	1061	1015	853	825	662	674	579	570	525	588	388	473	393	421	328
Eur/Other	20-24	18631	17821	18526	18802	18850	19165	18843	18663	18593	18553	18072	17908	18351	17812	18135	16365	16672	15842	16317	15378
Eur/Other	25-29	16588	14661	15794	14972	15188	15003	15283	14733	15179	15010	15190	15009	15985	15664	16322	14858	15747	14886	16337	14707
Eur/Other	30-34	17835	15750	16892	15806	15745	15430	15700	15022	15299	14790	14697	14437	15184	14571	15240	14246	14719	14243	16027	14825
Eur/Other	35-39	21688	19787	20167	19463	18759	18019	18008	16855	16644	15718	15635	14817	15507	14953	15299	14281	14413	13732	14937	13986
Eur/Other	40-44	20667	19993	20358	20428	19873	20291	19960	19551	18866	18921	18224	17960	18520	17421	16800	15906	15609	14587	15717	14707
Eur/Other	45-49	20249	20619	19982	20248	19125	19455	18677	18797	17806	17978	17090	17615	17662	17859	17396	16858	16788	16784	17488	16962
Eur/Other	50-54	16512	17095	16822	17591	16934	17844	17523	17709	17166	17778	16701	17325	17327	17324	16244	15905	15427	15512	15870	15774
Eur/Other	55-59	13098	13927	13562	13930	13415	14092	13994	14226	13595	14415	13903	14452	14470	15107	14456	14552	14656	14745	15351	15514
Eur/Other	60-64	10654	11439	11411	11651	11234	11949	11330	11602	11079	11694	11075	11871	11734	11981	11702	11562	11575	11857	12245	12650
Eur/Other	65-69	7194	7597	7632	7644	7393	7932	8172	8624	8579	9074	8930	9576	9746	9770	9578	9450	9300	9513	10046	9893
Eur/Other	70+	2250	2485	2337	2381	2355	2464	2358	2327	2158	2342	2191	2249	2162	2199	2229	2352	2353	2381	2586	2471

Indicator 5.5 – Laboratory turnaround time

Table 63 - Timeliness of cytology reporting by laboratory, 1 July – 31 December 2018

Laboratory	Laboratory turnaround time - cytology								
	Within 7 days		8-15 days		Total within 15 days		More than 15 days		Total
	N	%	N	%	N	%	N	%	N
Anatomical Pathology Services	43,122	97.8	884	2.0	44,006	99.8	108	0.2	44,114
Canterbury Health Laboratories	9,193	91.9	758	7.6	9,951	99.4	57	0.6	10,008
LabPLUS	7,200	91.8	530	6.8	7,730	98.6	111	1.4	7,841
Medlab Central Ltd	14,450	93.2	898	5.8	15,348	99.0	157	1.0	15,505
Pathlab	26,990	98.9	242	0.9	27,232	99.8	53	0.2	27,285
Southern Community Labs Dunedin	106,793	97.4	1,565	1.4	108,358	98.8	1,324	1.2	109,682
Total	**207,748**	**96.9**	**4,877**	**2.3**	**212,625**	**99.2**	**1,810**	**0.8**	**214,435**

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 64 - Timeliness of histology reporting by laboratory, 1 July – 31 December 2018

Laboratory	Laboratory turnaround time - histology								
	Within 10 days		10-15 days		Total within 15 days		More than 15 days		Total
	N	%	N	%	N	%	N	%	N
Anatomical Pathology Services	1,559	98.6	13	0.8	1,572	99.4	9	0.6	1,581
Canterbury Health Laboratories	1,272	84.1	198	13.1	1,470	97.2	43	2.8	1,513
LabPLUS	694	82.1	83	9.8	777	92.0	68	8.0	845
Medlab Central Ltd.	861	95.2	9	1.0	870	96.2	34	3.8	904
Memorial Hospital Hastings Laboratory	68	86.1	2	2.5	70	88.6	9	11.4	79
Middlemore Hospital Laboratory	646	88.9	56	7.7	702	96.6	25	3.4	727
Nelson Hospital Laboratory	114	98.3	1	0.9	115	99.1	1	0.9	116
North Shore Hospital Laboratory	936	95.2	27	2.7	963	98.0	20	2.0	983
Northland Pathology Laboratory	220	90.9	19	7.9	239	98.8	3	1.2	242
Pathlab	877	84.2	84	8.1	961	92.2	81	7.8	1,042
Southern Community Laboratories Dunedin	2,717	99.1	11	0.4	2,728	99.5	14	0.5	2,742
Southern Community Laboratories Wellington	974	97.0	27	2.7	1,001	99.7	3	0.3	1,004
Taranaki Medlab	300	100.0	-	0.0	300	100.0	-	0.0	300
Waikato Hospital Laboratory	144	80.9	4	2.2	148	83.1	30	16.9	178
Total	**11,382**	**92.9**	**534**	**4.4**	**11,916**	**97.2**	**340**	**2.8**	**12,256**

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 65 - Timeliness of reporting for cytology with associated HPV testing by laboratory, 1 July – 31 December 2018

Laboratory	Laboratory turnaround time - cytology with HPV testing				
	Within 15 days		More than 15 days		Total
	N	%	N	%	N
Anatomical Pathology Services	792	99.5	4	0.5	796
Canterbury Health Laboratories	188	97.4	5	2.6	193
LabPLUS	231	98.7	3	1.3	234
Medlab Central Ltd.	419	99.3	3	0.7	422
Pathlab	544	99.3	4	0.7	548
Southern Community Laboratories	1,000	99.5	5	0.5	1,005
Total	**3,174**	**99.2**	**24**	**0.8**	**3,198**

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

Table 66 - Women with a histology report within 90 days of a high -grade cytology report, by DHB and age

DHB	<20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70+		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Auckland	-	-	24	85.7	33	91.7	31	79.5	22	88.0	15	78.9	9	75.0	6	54.5	8	72.7	8	80.0	8	61.5	1	100.0	165
Bay of Plenty	-	-	8	100.0	28	87.5	16	94.1	7	77.8	6	75.0	8	80.0	4	100.0	3	75.0	2	50.0	1	50.0	4	80.0	87
Canterbury	-	-	34	89.5	52	98.1	47	95.9	17	94.4	15	100.0	14	93.3	7	87.5	8	72.7	2	33.3	3	60.0	1	50.0	200
Capital & Coast	-	-	17	94.4	24	85.7	29	100.0	18	85.7	9	90.0	6	85.7	5	71.4	3	60.0	1	100.0	1	33.3	0	0.0	113
Counties Manukau	1	100.0	19	70.4	28	80.0	29	74.4	18	81.8	13	92.9	13	68.4	6	75.0	5	41.7	4	50.0	7	77.8	1	33.3	144
Hawke's Bay	-	-	4	57.1	14	87.5	17	89.5	5	71.4	6	66.7	3	100.0	3	60.0	6	75.0	1	100.0	1	50.0	1	100.0	61
Hutt Valley	-	-	6	85.7	12	100.0	9	90.0	4	100.0	3	100.0	1	100.0	-	-	1	33.3	-	-	0	0.0	-	-	36
Lakes	-	-	3	75.0	2	100.0	7	77.8	3	100.0	5	100.0	3	60.0	3	100.0	4	100.0	1	50.0	1	100.0	4	80.0	36
Mid Central	-	-	19	95.0	20	87.0	20	83.3	9	90.0	7	100.0	3	75.0	6	75.0	2	66.7	4	100.0	2	66.7	2	100.0	94
Nelson Marlborough	-	-	4	100.0	11	91.7	7	100.0	7	100.0	4	80.0	5	100.0	2	66.7	2	66.7	3	50.0	2	100.0	0	0.0	47
Northland	-	-	5	100.0	9	90.0	10	83.3	3	60.0	5	100.0	4	100.0	6	100.0	4	57.1	2	66.7	1	100.0	2	100.0	51
South Canterbury	-	-	3	100.0	2	100.0	4	100.0	3	100.0	2	100.0	-	-	1	100.0	1	33.3	0	0.0	1	100.0	1	50.0	18
Southern	-	-	11	100.0	26	83.9	40	95.2	21	95.5	6	75.0	10	83.3	3	100.0	5	71.4	7	70.0	2	100.0	1	100.0	132
Tairawhiti	-	-	1	33.3	6	100.0	5	71.4	4	80.0	3	75.0	-	-	-	-	1	100.0	3	100.0	1	100.0	0	0.0	24
Taranaki	-	-	3	75.0	10	90.9	11	100.0	5	83.3	3	100.0	4	100.0	-	-	2	100.0	1	100.0	1	50.0	1	50.0	41
Waikato	-	-	17	100.0	27	100.0	24	82.8	14	87.5	8	100.0	3	100.0	4	44.4	1	50.0	7	87.5	3	100.0	4	80.0	112
Wairarapa	-	-	3	100.0	4	66.7	3	100.0	-	-	2	100.0	-	-	2	100.0	-	-	-	-	-	-	-	-	14
Waitemata	-	-	30	93.8	35	76.1	25	80.6	14	70.0	14	87.5	16	94.1	11	91.7	8	88.9	4	50.0	1	33.3	5	71.4	163
West Coast	-	-	4	100.0	2	100.0	4	100.0	-	-	-	-	0	0.0	1	100.0	-	-	-	-	-	-	-	-	11
Whanganui	-	-	4	66.7	6	75.0	5	71.4	6	100.0	3	100.0	2	100.0	-	-	-	-	1	100.0	1	100.0	1	100.0	29
Total	**1**	**100.0**	**219**	**88.0**	**351**	**88.2**	**343**	**87.5**	**180**	**86.1**	**129**	**88.4**	**104**	**83.9**	**70**	**76.9**	**64**	**67.4**	**51**	**66.2**	**37**	**66.1**	**29**	**65.9**	**1,578**

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

Table 67 - Women with a histology report within 180 days of a high -grade cytology report, by DHB and age

DHB	<20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70+		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Auckland	-	-	26	92.9	34	94.4	32	82.1	23	92.0	16	84.2	9	75.0	9	81.8	8	72.7	9	90.0	9	69.2	1	100.0	176
Bay of Plenty	-	-	8	100.0	28	87.5	16	94.1	8	88.9	8	100.0	8	80.0	4	100.0	3	75.0	2	50.0	1	50.0	4	80.0	90
Canterbury	-	-	34	89.5	52	98.1	48	98.0	18	100.0	15	100.0	14	93.3	7	87.5	9	81.8	2	33.3	3	60.0	1	50.0	203
Capital & Coast	-	-	17	94.4	25	89.3	29	100.0	21	100.0	9	90.0	7	100.0	6	85.7	4	80.0	1	100.0	2	66.7	0	0.0	121
Counties Manukau	1	100.0	19	70.4	28	80.0	33	84.6	21	95.5	13	92.9	14	73.7	6	75.0	9	75.0	6	75.0	8	88.9	1	33.3	159
Hawke's Bay	-	-	4	57.1	14	87.5	17	89.5	6	85.7	7	77.8	3	100.0	3	60.0	6	75.0	1	100.0	1	50.0	1	100.0	63
Hutt Valley	-	-	6	85.7	12	100.0	10	100.0	4	100.0	3	100.0	1	100.0	-	-	1	33.3	-	-	0	0.0	-	-	37
Lakes	-	-	3	75.0	2	100.0	8	88.9	3	100.0	5	100.0	5	100.0	3	100.0	4	100.0	1	50.0	1	100.0	5	100.0	40
Mid Central	-	-	19	95.0	21	91.3	22	91.7	9	90.0	7	100.0	4	100.0	7	87.5	2	66.7	4	100.0	3	100.0	2	100.0	100
Nelson Marlborough	-	-	4	100.0	11	91.7	7	100.0	7	100.0	4	80.0	5	100.0	2	66.7	2	66.7	3	50.0	2	100.0	1	50.0	48
Northland	-	-	5	100.0	9	90.0	10	83.3	4	80.0	5	100.0	4	100.0	6	100.0	5	71.4	3	100.0	1	100.0	2	100.0	54
South Canterbury	-	-	3	100.0	2	100.0	4	100.0	3	100.0	2	100.0	-	-	1	100.0	2	66.7	0	0.0	1	100.0	1	50.0	19
Southern	-	-	11	100.0	27	87.1	40	95.2	22	100.0	7	87.5	10	83.3	3	100.0	7	100.0	8	80.0	2	100.0	1	100.0	138
Tairawhiti	-	-	2	66.7	6	100.0	5	71.4	5	100.0	4	100.0	-	-	-	-	1	100.0	3	100.0	1	100.0	0	0.0	27
Taranaki	-	-	3	75.0	11	100.0	11	100.0	5	83.3	3	100.0	4	100.0	-	-	2	100.0	1	100.0	1	50.0	1	50.0	42
Waikato	-	-	17	100.0	27	100.0	26	89.7	14	87.5	8	100.0	3	100.0	4	44.4	1	50.0	8	100.0	3	100.0	4	80.0	115
Wairarapa	-	-	3	100.0	4	66.7	3	100.0	-	-	2	100.0	-	-	2	100.0	-	-	-	-	-	-	-	-	14
Waitemata	-	-	31	96.9	39	84.8	27	87.1	18	90.0	14	87.5	17	100.0	11	91.7	8	88.9	5	62.5	1	33.3	6	85.7	177
West Coast	-	-	4	100.0	2	100.0	4	100.0	-	-	-	-	1	100.0	1	100.0	-	-	-	-	-	-	-	-	12
Whanganui	-	-	4	66.7	7	87.5	6	85.7	6	100.0	3	100.0	2	100.0	-	-	-	-	1	100.0	1	100.0	1	100.0	31
Total	**1**	**100.0**	**223**	**89.6**	**361**	**90.7**	**358**	**91.3**	**197**	**94.3**	**135**	**92.5**	**111**	**89.5**	**75**	**82.4**	**74**	**77.9**	**58**	**75.3**	**41**	**73.2**	**32**	**72.7**	**1,666**

'– ' 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 68 - 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	146	129
Bay of Plenty	93	85
Canterbury	198	184
Capital & Coast	122	108
Counties Manukau	161	147
Hawke's Bay	71	65
Hutt Valley	36	32
Lakes	39	37
Mid Central	101	100
Nelson Marlborough	50	45
Northland	56	51
South Canterbury	18	17
Southern	127	116
Tairawhiti	33	28
Taranaki	41	40
Waikato	100	96
Wairarapa	15	15
Waitemata	153	148
West Coast	12	9
Whanganui	35	33
Private practice	275	194
Total	**1,882**	**1,679**

Table 69 - 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	297	275	197	71.6	236	85.8
Pacific	87	77	43	55.8	60	77.9
Asian	164	152	105	69.1	136	89.5
European/ Other	1,269	1,139	912	80.1	1,061	93.2
Total	**1,817**	**1,643**	**1,257**	**76.5**	**1,493**	**90.9**

Table 70 - 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	1,551	1,454	1,141	78.5	1,360	93.5
Auckland	134	124	95	76.6	115	92.7
Bay of Plenty	91	84	75	89.3	80	95.2
Canterbury	197	183	133	72.7	176	96.2
Capital & Coast	119	107	98	91.6	105	98.1
Counties Manukau	153	142	68	47.9	118	83.1
Hawke's Bay	69	65	54	83.1	63	96.9
Hutt Valley	36	32	27	84.4	32	100.0
Lakes	36	34	30	88.2	31	91.2
Mid Central	100	99	61	61.6	82	82.8
Nelson Marlborough	47	43	37	86.0	42	97.7
Northland	53	49	37	75.5	46	93.9
South Canterbury	18	17	13	76.5	17	100.0
Southern	123	114	102	89.5	111	97.4
Tairawhiti	31	28	20	71.4	24	85.7
Taranaki	39	39	31	79.5	37	94.9
Waikato	95	92	88	95.7	88	95.7
Wairarapa	15	15	13	86.7	15	100.0
Waitemata	150	145	123	84.8	137	94.5
West Coast	12	9	6	66.7	9	100.0
Whanganui	33	33	30	90.9	32	97.0
Private Practice	266	189	116	61.4	133	70.4
Total	**1,817**	**1,643**	**1,257**	**76.5**	**1,493**	**90.9**

Table 71 - 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	20	14
SC	10	8
AC1-AC5	30	11
R10, R14	5	3
Total	**65**	**36**

** 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 72 - 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	405	372	91.9	350	86.4	345	92.7	312	83.9
Bay of Plenty	242	216	89.3	224	92.6	206	95.4	191	88.4
Canterbury	248	237	95.6	231	93.1	226	95.4	224	94.5
Capital & Coast	127	120	94.5	120	94.5	116	96.7	109	90.8
Counties Manukau	358	343	95.8	320	89.4	317	92.4	316	92.1
Hawke's Bay	97	88	90.7	86	88.7	81	92.0	54	61.4
Hutt Valley	73	70	95.9	68	93.2	66	94.3	51	72.9
Lakes	96	93	96.9	90	93.8	88	94.6	78	83.9
Mid Central	136	129	94.9	123	90.4	119	92.2	108	83.7
Nelson Marlborough	57	52	91.2	51	89.5	49	94.2	43	82.7
Northland	62	61	98.4	56	90.3	56	91.8	53	86.9
South Canterbury	21	21	100.0	21	100.0	21	100.0	19	90.5
Southern	136	129	94.9	125	91.9	124	96.1	111	86.0
Tairawhiti	28	28	100.0	25	89.3	25	89.3	23	82.1
Taranaki	44	44	100.0	42	95.5	42	95.5	41	93.2
Waikato	284	277	97.5	261	91.9	260	93.9	229	82.7
Wairarapa	17	14	82.4	15	88.2	13	92.9	13	92.9
Waitemata	416	390	93.8	360	86.5	360	92.3	339	86.9
West Coast	27	25	92.6	26	96.3	25	100.0	25	100.0
Whanganui	71	69	97.2	66	93.0	65	94.2	64	92.8
Private practice	599	313	52.3	570	95.2	284	90.7	278	88.8
Total	**3,544**	**3,091**	**87.2**	**3,230**	**91.1**	**2,888**	**93.4**	**2,681**	**86.7**

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 73 - 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	444	405	91.2	385	86.7	358	88.4	322	79.5
Pacific	171	156	91.2	144	84.2	135	86.5	125	80.1
Asian	434	387	89.2	398	91.7	369	95.3	346	89.4
European/ Other	2,495	2,143	85.9	2,303	92.3	2,026	94.5	1,888	88.1
Total	**3,544**	**3,091**	**87.2**	**3,230**	**91.1**	**2,888**	**93.4**	**2,681**	**86.7**

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 74 - 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	10,259	97.2	100.0	91.8	93.8	93.3	92.6
Auckland	964	98.0	100.0	90.6	98.7	98.2	92.0
Bay of Plenty	476	97.5	100.0	90.0	90.5	90.5	91.0
Canterbury	1,611	96.2	100.0	92.8	98.1	97.8	92.2
Capital & Coast	679	99.1	100.0	90.1	97.2	96.3	95.0
Counties Manukau	828	96.6	100.0	93.4	100.0	99.4	92.5
Hawke's Bay	346	98.6	100.0	87.8	92.8	91.9	92.8
Hutt Valley	288	98.6	100.0	92.3	95.8	95.1	93.4
Lakes	240	97.1	100.0	94.9	96.7	96.3	93.3
Mid Central	599	94.3	100.0	93.1	98.3	98.0	90.3
Nelson Marlborough	339	95.6	100.0	88.4	78.8	78.2	90.3
Northland	285	96.5	100.0	89.8	99.3	98.2	91.6
South Canterbury	99	93.9	100.0	87.8	92.9	91.9	87.9
Southern	599	97.5	100.0	87.7	97.7	97.3	90.2
Tairawhiti	154	98.1	100.0	88.8	98.1	98.1	90.9
Taranaki	331	97.3	100.0	85.1	99.4	99.4	90.3
Waikato	746	98.1	100.0	95.6	76.7	75.2	95.6
Wairarapa	87	97.7	100.0	95.5	94.3	94.3	94.3
Waitemata	1,298	97.5	100.0	94.0	85.4	85.0	94.5
West Coast	75	97.3	100.0	90.0	100.0	100.0	90.7
Whanganui	215	96.7	100.0	94.7	98.1	97.7	93.5
Private practice	1,411	97.0	100.0	91.3	96.6	93.9	92.3
Total	**11,670**	**97.1**	**100.0**	**91.7**	**94.1**	**93.4**	**92.5**

Table 75 - Summary of colposcopic appearance findings, by DHB

DHB	Total colposcopies	SCJ visible*	Colposcopic appearance (as % of colposcopies where items are completed)	
	N	N	Abnormal	Inconclusive
Public clinics overall	10,259	9,968	55.0	4.9
Auckland	964	945	59.8	6.2
Bay of Plenty	476	464	58.8	6.5
Canterbury	1,611	1,550	60.2	4.7
Capital & Coast	679	673	40.1	4.4
Counties Manukau	828	800	57.9	4.1
Hawke's Bay	346	341	43.6	6.1
Hutt Valley	288	284	62.5	5.2
Lakes	240	233	69.6	3.8
Mid Central	599	565	53.9	4.0
Nelson Marlborough	339	324	51.9	6.8
Northland	285	275	43.2	4.9
South Canterbury	99	93	43.4	6.1
Southern	599	584	55.8	7.8
Tairawhiti	154	151	66.9	8.4
Taranaki	331	322	43.2	7.6
Waikato	746	732	55.2	2.5
Wairarapa	87	85	72.4	3.4
Waitemata	1,298	1,266	50.7	3.2
West Coast	75	73	60.0	6.7
Whanganui	215	208	66.0	3.7
Private practice	1,411	1,368	51.8	5.0
Total	**11,670**	**11,336**	**54.6**	**4.9**

** Field has been completed.*

Table 76 - 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	5,640	5,264	93.3	504	147	29.2	4,115	872	21.2
Auckland	576	539	93.6	60	19	31.7	328	57	17.4
Bay of Plenty	280	246	87.9	31	10	32.3	165	21	12.7
Canterbury	970	922	95.1	75	27	36.0	566	146	25.8
Capital & Coast	272	254	93.4	30	8	26.7	377	125	33.2
Counties Manukau	479	460	96.0	34	10	29.4	315	38	12.1
Hawke's Bay	151	143	94.7	21	2	9.5	174	36	20.7
Hutt Valley	180	165	91.7	15	4	26.7	93	17	18.3
Lakes	167	146	87.4	9	2	22.2	64	9	14.1
Mid Central	323	307	95.0	24	6	25.0	252	51	20.2
Nelson Marlborough	176	157	89.2	23	7	30.4	140	37	26.4
Northland	123	121	98.4	14	3	21.4	148	35	23.6
South Canterbury	43	36	83.7	6	2	33.3	50	7	14.0
Southern	334	321	96.1	47	21	44.7	218	68	31.2
Tairawhiti	103	92	89.3	13	3	23.1	38	12	31.6
Taranaki	143	134	93.7	25	6	24.0	163	27	16.6
Waikato	412	398	96.6	19	8	42.1	315	53	16.8
Wairarapa	63	61	96.8	3	2	66.7	21	7	33.3
Waitemata	658	584	88.8	42	2	4.8	598	111	18.6
West Coast	45	38	84.4	5	3	60.0	25	4	16.0
Whanganui	142	140	98.6	8	2	25.0	65	11	16.9
Private practice	731	615	84.1	70	45	64.3	610	137	22.5
Total	**6,371**	**5,879**	**92.3**	**574**	**192**	**33.4**	**4,725**	**1,009**	**21.4**

Indicator 7.5 – Timely discharge of women after treatment

Table 77 - 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	Eligible for discharge*		Women discharged appropriately	
	N	N	% of women treated	N	% of eligible
Auckland	84	62	73.8	55	88.7
Bay of Plenty	59	48	81.4	43	89.6
Canterbury	174	129	74.1	91	70.5
Capital & Coast	52	41	78.8	38	92.7
Counties Manukau	123	74	60.2	72	97.3
Hawke's Bay	61	44	72.1	37	84.1
Hutt Valley	23	20	87.0	19	95.0
Lakes	32	27	84.4	22	81.5
Mid Central	75	51	68.0	46	90.2
Nelson Marlborough	55	50	90.9	50	100.0
Northland	68	41	60.3	34	82.9
South Canterbury	8	8	100.0	3	37.5
Southern	100	86	86.0	76	88.4
Tairawhiti	28	22	78.6	22	100.0
Taranaki	44	37	84.1	31	83.8
Waikato	116	98	84.5	97	99.0
Wairarapa	9	5	55.6	5	100.0
Waitemata	107	76	71.0	58	76.3
West Coast	11	7	63.6	6	85.7
Whanganui	30	19	63.3	18	94.7
Private Practice	82	70	85.4	50	71.4
Total	**1,341**	**1,015**	**75.7**	**873**	**86.0**

** 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 78 - 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	% of women treated	N	% of eligible
Auckland	84	81	96.4	80	95.2
Bay of Plenty	59	26	44.1	26	44.1
Canterbury	174	121	69.5	117	67.2
Capital & Coast	52	48	92.3	48	92.3
Counties Manukau	123	73	59.3	71	57.7
Hawke's Bay	61	37	60.7	37	60.7
Hutt Valley	23	20	87.0	20	87.0
Lakes	32	21	65.6	21	65.6
Mid Central	75	61	81.3	60	80.0
Nelson Marlborough	55	42	76.4	42	76.4
Northland	68	58	85.3	56	82.4
South Canterbury	8	5	62.5	5	62.5
Southern	100	83	83.0	83	83.0
Tairawhiti	28	19	67.9	19	67.9
Taranaki	44	34	77.3	34	77.3
Waikato	116	102	87.9	102	87.9
Wairarapa	9	6	66.7	6	66.7
Waitemata	107	94	87.9	94	87.9
West Coast	11	3	27.3	3	27.3
Whanganui	30	27	90.0	27	90.0
Private Practice	82	56	68.3	55	67.1
Total	**1,341**	**1,017**	**75.8**	**1,006**	**75.0**

Indicator 8 – HPV tests

Indicator 8.1 – Triage of low-grade cytology

Table 79 - Triage testing of women with ASC-US cytology

Laboratory	Total ASC-US results		Women with an HPV test			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
	N	N	N	%	N	%
Anatomical Pathology Services	194	417	1	0.5	410	98.3
Canterbury Health Laboratories	51	142	0	0.0	140	98.6
LabPLUS	62	168	0	0.0	164	97.6
Medlab Central Ltd.	133	293	0	0.0	267	91.1
Pathlab	115	274	0	0.0	266	97.1
Southern Community Laboratories	225	390	5	2.2	380	97.4
Total	**780**	**1,684**	**6**	**0.8**	**1,627**	**96.6**

** 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 80 - Triage testing of women with LSIL cytology

Laboratory	Total ASC-US results		Women with an HPV test			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
	N	N	N	%	N	%
Anatomical Pathology Services	491	374	2	0.4	370	98.9
Canterbury Health Laboratories	89	56	0	0.0	55	98.2
LabPLUS	96	65	1	1.0	63	96.9
Medlab Central Ltd.	176	168	1	0.6	152	90.5
Pathlab	298	283	1	0.3	273	96.5
Southern Community Laboratories	1,015	684	10	1.0	645	94.3
Total	**2,165**	**1,630**	**15**	**0.7**	**1,558**	**95.6**

** 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 81 - 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	76	72	94.7	57	75.0	8	11.1	14.0
Canterbury Health Laboratories	18	18	100.0	15	83.3	7	38.9	46.7
LabPLUS	23	20	87.0	11	47.8	0	0.0	0.0
Medlab Central Ltd.	45	37	82.2	23	51.1	4	10.8	17.4
Pathlab	90	87	96.7	47	52.2	12	13.8	25.5
Southern Community Laboratories	89	83	93.3	57	64.0	14	16.9	24.6
Total	**341**	**317**	**93.0**	**210**	**61.6**	**45**	**14.2**	**21.4**

** % 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 2017), to allow for sufficient follow-up time for colposcopy/ histology.*

Table 82 - 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	227	211	93.0	149	65.6	24	11.4	16.1
Canterbury Health Laboratories	36	36	100.0	31	86.1	7	19.4	22.6
LabPLUS	45	39	86.7	28	62.2	4	10.3	14.3
Medlab Central Ltd.	58	57	98.3	41	70.7	11	19.3	26.8
Pathlab	165	149	90.3	102	61.8	24	16.1	23.5
Southern Community Laboratories	356	331	93.0	240	67.4	46	13.9	19.2
Total	**887**	**823**	**92.8**	**591**	**66.6**	**116**	**14.1**	**19.6**

** % 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 83 - 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	3,773	21.7	8.6
Canterbury Health Laboratories	1,291	7.4	12.9
LabPLUS	717	4.1	9.1
Medlab Central Ltd	1,649	9.5	10.6
Pathlab	2,291	13.2	8.4
Southern Community Labs	7,698	44.2	7.0
Total	**17,419**	**100.0**	**8.1**

Table 84 - Invalid HPV tests, by laboratory

Laboratory	Total	Valid		Invalid	
	N	N	%	N	%
Anatomical Pathology Services	3,773	3,773	100.0	-	0.00
Canterbury Health Laboratories	1,291	1,289	99.8	2	0.15
LabPLUS	717	716	99.9	1	0.14
Medlab Central Ltd.	1,649	1,648	99.9	1	0.06
Pathlab	2,291	2,291	100.0	-	0.00
Southern Community Laboratories	7,698	7,697	100.0	1	0.01
Total	**17,419**	**17,414**	**100.0**	**5**	**0.03**

Table 85 - Validity of HPV triage tests, by test technology

Test technology	Total HPV tests		Valid		Invalid	
	N	%	N	%	N	%
Abbott RealTime High Risk HPV	8,989	51.6	8,986	100.0	3	0.03
BD Onclarity	2,291	13.2	2,291	100.0	-	0.00
Roche COBAS 4800 HPV	6,139	35.2	6,137	100.0	2	0.03
Total	**17,419**	**100.0**	**17,414**	**100.0**	**5**	**0.03**

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

Ethnicity	Post-treatment		Historical		Taken at colposcopy		HPV triage		Other		Total
	N	%	N	%	N	%	N	%	N	%	N
Māori	371	14.0	1,103	41.7	148	5.6	361	13.6	665	25.1	2,648
Pacific	87	13.8	192	30.4	41	6.5	160	25.3	152	24.1	632
Asian	230	15.7	364	24.9	124	8.5	461	31.5	285	19.5	1,464
European/ Other	1,870	14.8	4,562	36.0	911	7.2	2,007	15.8	3,325	26.2	12,675
Total	**2,558**	**14.7**	**6,221**	**35.7**	**1,224**	**7.0**	**2,989**	**17.2**	**4,427**	**25.4**	**17,419**

Table 87 - Volume of HPV test samples received during the monitoring period, by purpose and age

Age	Post-treatment		Historical		Taken at colposcopy		HPV triage		Other		Total
	N	%	N	%	N	%	N	%	N	%	N
<20	-	0.0	-	-	1	25.0	-	0.0	3	75.0	4
20-24	150	23.4	50	7.8	151	23.6	-	0.0	290	45.2	641
25-29	575	33.6	545	31.9	188	11.0	-	0.0	401	23.5	1,709
30-34	637	22.5	978	34.5	175	6.2	595	21.0	446	15.8	2,831
35-39	432	17.7	975	39.9	118	4.8	525	21.5	396	16.2	2,446
40-44	263	12.4	926	43.8	109	5.2	459	21.7	358	16.9	2,115
45-49	204	9.5	894	41.7	109	5.1	442	20.6	495	23.1	2,144
50-54	118	6.7	662	37.3	109	6.1	353	19.9	531	29.9	1,773
55-59	84	5.4	540	34.6	99	6.4	285	18.3	551	35.3	1,559
60-64	47	4.3	347	31.4	78	7.1	178	16.1	455	41.2	1,105
65-69	32	4.1	198	25.2	63	8.0	122	15.5	371	47.2	786
70+	16	5.2	106	34.6	24	7.8	30	9.8	130	42.5	306
Total	**2,558**	**14.7**	**6,221**	**35.7**	**1,224**	**7.0**	**2,989**	**17.2**	**4,427**	**25.4**	**17,419**

Table 88 - 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	531	14.1	1,465	38.8	130	3.4	783	20.8	864	22.9	3,773
Canterbury Health Laboratories	272	21.1	362	28.0	258	20.0	185	14.3	214	16.6	1,291
LabPLUS	93	13.0	156	21.8	149	20.8	220	30.7	99	13.8	717
Medlab Central Ltd.	290	17.6	539	32.7	43	2.6	379	23.0	398	24.1	1,649
Pathlab	289	12.6	970	42.3	219	9.6	482	21.0	331	14.4	2,291
Southern Community Laboratories	1,083	14.1	2,729	35.5	425	5.5	940	12.2	2,521	32.7	7,698
Total	**2,558**	**14.7**	**6,221**	**35.7**	**1,224**	**7.0**	**2,989**	**17.2**	**4,427**	**25.4**	**17,419**

Table 89 - 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	873	10,259	8.5
Auckland	28	964	2.9
Bay of Plenty	118	476	24.8
Canterbury	170	1,611	10.6
Capital & Coast	80	679	11.8
Counties Manukau	58	828	7.0
Hawke's Bay	23	346	6.6
Hutt Valley	7	288	2.4
Lakes	81	240	33.8
Mid Central	15	599	2.5
Nelson Marlborough	33	339	9.7
Northland	18	285	6.3
South Canterbury	18	99	18.2
Southern	56	599	9.3
Tairawhiti	1	154	0.6
Taranaki	19	331	5.7
Waikato	62	746	8.3
Wairarapa	14	87	16.1
Waitemata	44	1,298	3.4
West Coast	11	75	14.7
Whanganui	17	215	7.9
Private practice	171	1,411	12.1
Total	**1,044**	**11,670**	**8.9**

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 90 - Women eligible for and proportion who have received HPV testing for a historical high -grade abnormality, by age at 31 December 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	22	22	11	50.0	9	40.9
30-34	1,291	1,282	861	67.2	682	53.2
35-39	5,465	5,430	3,671	67.6	3,082	56.8
40-44	9,066	8,989	6,344	70.6	5,396	60.0
45-49	11,063	10,936	7,829	71.6	6,677	61.1
50-54	8,337	8,192	5,862	71.6	4,991	60.9
55-59	6,192	5,998	4,285	71.4	3,694	61.6
60-64	3,857	3,723	2,698	72.5	2,327	62.5
65-69	2,299	2,145	1,532	71.4	1,335	62.2
70+	2,919	2,375	985	41.5	778	32.8
Total	**50,511**	**49,092**	**34,078**	**69.4**	**28,971**	**59.0**

** 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 91 - 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	3,953	3,877	2,283	58.9	1,856	47.9
Bay of Plenty	3,038	2,945	2,118	71.9	1,754	59.6
Canterbury	6,028	5,880	4,133	70.3	3,622	61.6
Capital & Coast	2,779	2,733	1,886	69.0	1,681	61.5
Counties Manukau	3,513	3,403	1,995	58.6	1,561	45.9
Hawke's Bay	2,245	2,170	1,593	73.4	1,368	63.0
Hutt Valley	1,534	1,489	1,041	69.9	904	60.7
Lakes	1,612	1,570	1,000	63.7	799	50.9
Mid Central	2,255	2,182	1,644	75.3	1,465	67.1
Nelson Marlborough	1,917	1,856	1,497	80.7	1,365	73.5
Northland	1,952	1,871	1,208	64.6	941	50.3
South Canterbury	840	814	630	77.4	555	68.2
Southern	4,762	4,643	3,404	73.3	2,965	63.9
Tairawhiti	920	884	580	65.6	493	55.8
Taranaki	2,234	2,154	1,622	75.3	1,446	67.1
Waikato	4,039	3,923	2,962	75.5	2,569	65.5
Wairarapa	520	505	351	69.5	295	58.4
Waitemata	5,100	4,968	3,235	65.1	2,577	51.9
West Coast	433	425	340	80.0	298	70.1
Whanganui	825	790	556	70.4	457	57.8
Unspecified	12	10	-	0.0	-	0.0
Total	**50,511**	**49,092**	**34,078**	**69.4**	**28,971**	**59.0**

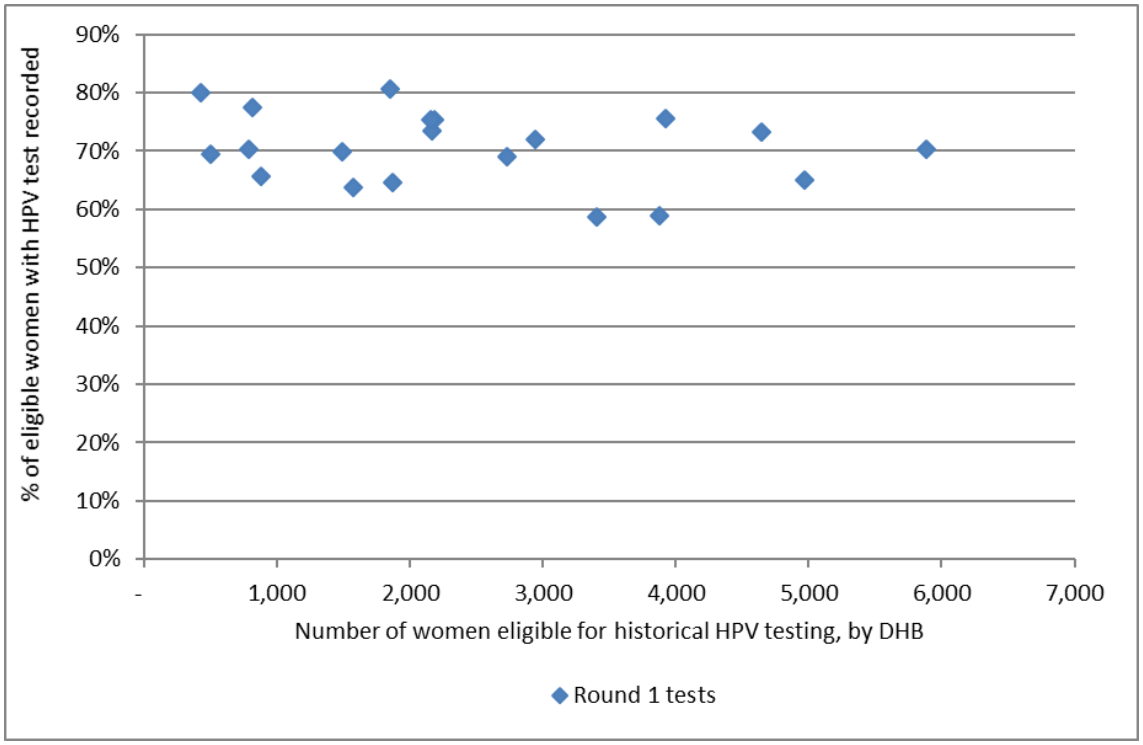
** Women are not followed up in the current report if they are no longer alive at the end of the current monitoring period; or if they have since had a non-squamous high -grade abnormality (no longer eligible for historical HPV testing).*

Table 92 - 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	7,964	7,638	4,987	65.3	3,921	51.3
Pacific	1,236	1,194	602	50.4	475	39.8
Asian	1,705	1,680	955	56.8	796	47.4
European/ Other	39,606	38,580	27,534	71.4	23,779	61.6
Total	**50,511**	**49,092**	**34,078**	**69.4**	**28,971**	**59.0**

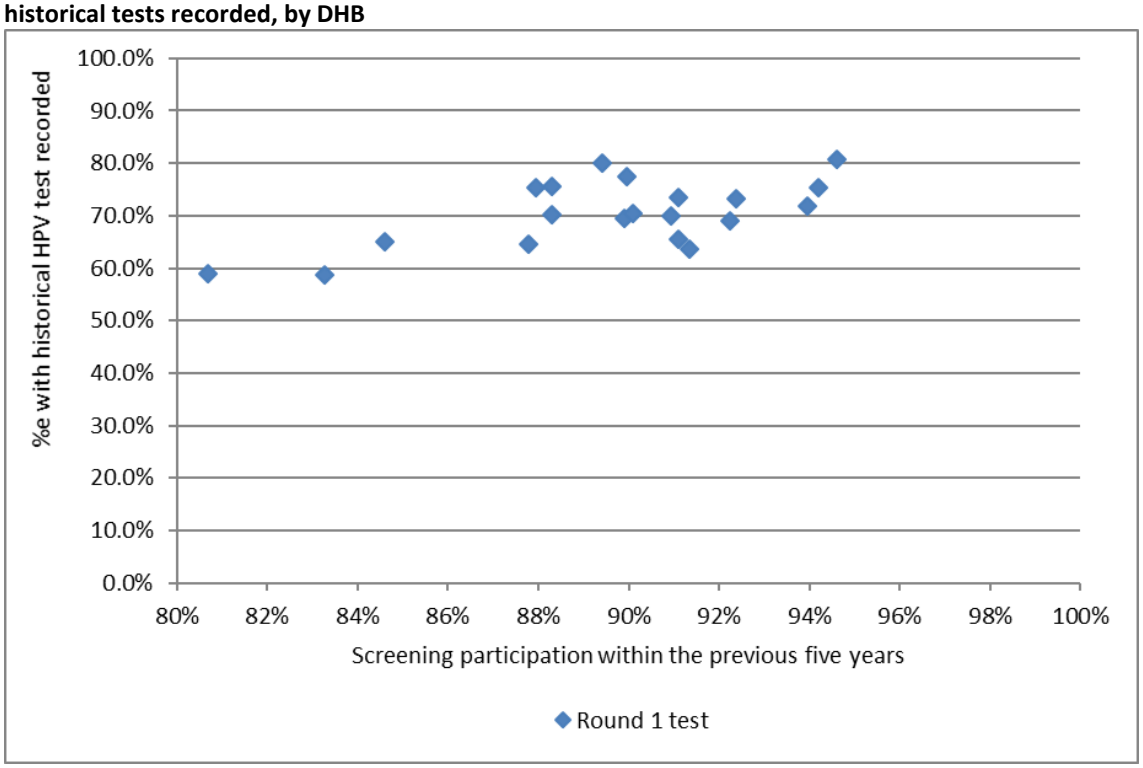
** Women are not followed up in the current report if they are no longer alive at the end of the current monitoring period; or if they have since had a non-squamous high -grade abnormality (no longer eligible for historical HPV testing).*

Figure 126 - Number of women eligible for historical testing within a DHB versus the percentage with a Round 1 historical HPV test recorded



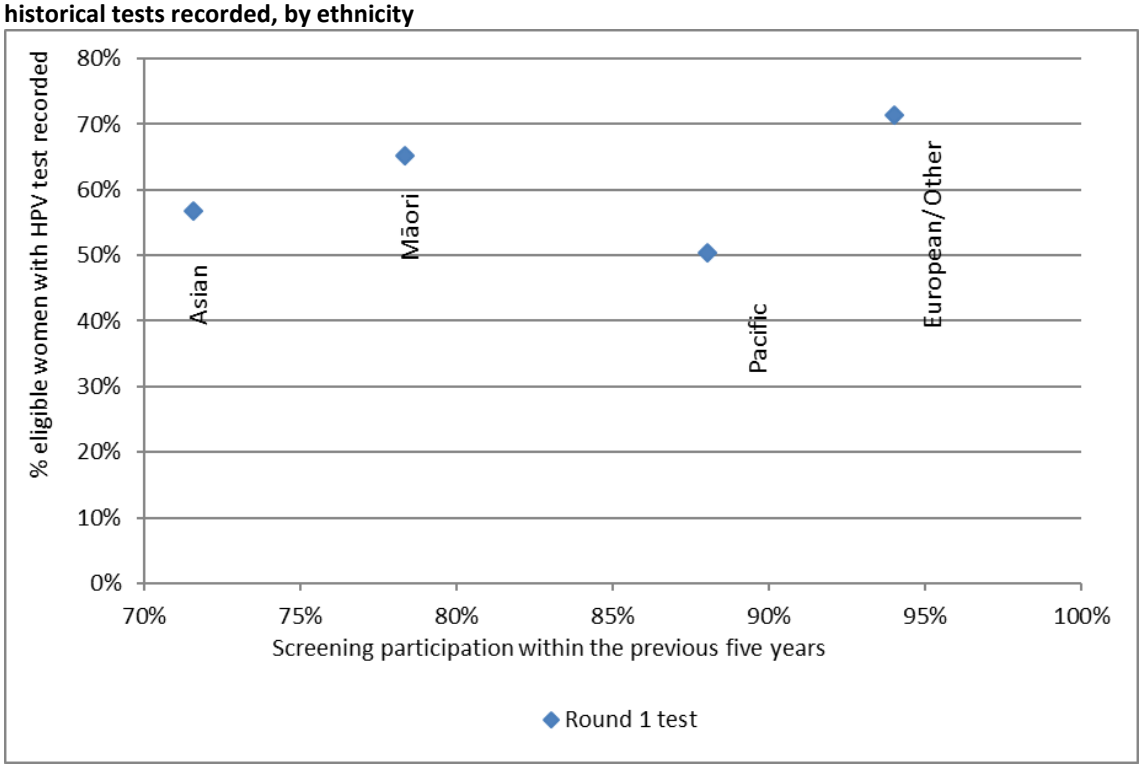
Each dot represents a DHB.
This chart does not suggest that there is any relationship between the number of women eligible for testing and percent of women who have been tested, therefore this does not seem a likely explanation for the variation in women tested in different DHBs.

Figure 127 - 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 93.

Figure 128 - 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 93 - 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	80.7%	58.9%	47.9%
Bay of Plenty	94.0%	71.9%	59.6%
Canterbury	88.3%	70.3%	61.6%
Capital & Coast	92.3%	69.0%	61.5%
Counties Manukau	83.3%	58.6%	45.9%
Hawke's Bay	91.1%	73.4%	63.0%
Hutt Valley	90.9%	69.9%	60.7%
Lakes	91.3%	63.7%	50.9%
Mid Central	87.9%	75.3%	67.1%
Nelson Marlborough	94.6%	80.7%	73.5%
Northland	87.8%	64.6%	50.3%
South Canterbury	90.0%	77.4%	68.2%
Southern	92.4%	73.3%	63.9%
Tairawhiti	91.1%	65.6%	55.8%
Taranaki	94.2%	75.3%	67.1%
Waikato	88.3%	75.5%	65.5%
Wairarapa	89.9%	69.5%	58.4%
Waitemata	84.6%	65.1%	51.9%
West Coast	89.4%	80.0%	70.1%
Whanganui	90.1%	70.4%	57.8%

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 94 - 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
Southern	General Gynae Department – Dunedin Hospital

DHB	Colposcopy clinics included*
	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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