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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 2017.

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 1,241,159 eligible women aged 25-69 years at the end of the monitoring period, 928,518 (74.8%) 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 met for only one five-year age group (women aged 45-49 years).
- Three of 20 DHBs met the coverage target.
- Nationally, coverage targets were met for European/ Other women (80.4% screened within the previous three years), but were not met for Māori, Pacific, or Asian women (62.0%, 73.4%, 63.4% respectively screened within the previous three years). Five-year coverage among women aged 25-69 years exceeded 80% in all DHBs, in Pacific and European/ Other women, and in women in all five-year age groups between 30-69 years.

The estimates for the number of women eligible for screening were updated in the current report to use updated population projections based on the 2013 Census and updated estimates for hysterectomy prevalence. While this should have resulted in more accurate estimates of coverage, they were generally lower than in recent monitoring reports. However, when the effect due to the change in estimating the eligible population was removed:

- Three-year coverage among women aged 25-69 years (76.5%) is similar to that reported in the previous monitoring report (76.4%) and has increased in Maori and Asian ethnic groups.
- Three-year coverage is lower than in the previous report in three of the 10 age groups.
- Three-year coverage is lower than in the previous report in five of 20 DHBs.
- Five-year coverage among women aged 25-69 years (90.6%) is similar to that reported in the previous monitoring report (90.3%).

Screens in women aged less than 20 years

Target: None

- In the three years to 31 December 2017, 5,682 women had a cervical sample taken when they were aged less than 20 years. This is fewer than in the previous monitoring period (6,076 women).
- This represents 0.5% of all women (of any age) who were screened in the three-year period (which is slightly lower than the previous monitoring period, 0.6%).
- Most of these women (89.7%) were aged 18-19 years at the time of their cervical sample.

Indicator 1.2 <u>Regularity of screening</u>

Target: Not yet defined

Routine screening (3-year recall)

- Among women attending for screening in 2017 following a 3-year recall recommendation, 62.5% were attending on-time; 13.4% more than six months early; and 24.1% more than six months late.
- Between the period 2013 to 2017, the proportion of women who were screened on-time increased in all ethnic groups and all 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 2017 following a 12-month repeat recommendation, 40.5% were attending on-time; 2.4% more than three months early; and 57.1% more than three months late.
- In 2017, 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 2013 to 2017, the proportion of women who were re-attending on-time for 12-month follow-up and the proportion who were re-attending more than three months early both decreased. 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.

Indicator 2 — First screening events

Target: None

- There were 22,618 women who had their first screening event during the current monitoring period – an increase compared to the previous monitoring period.
- First screening events generally occur among young women (median age 26 years).
- Asian women appear to have their first screening event at a later age (median age of Asian women attending for their first screening event was 31 years).
- The proportion of women attending for screening who are attending for their first test is highest in Asian women.

Indicator 3 — Withdrawal rates

Target: Zero between ages 20-69 years

- There were 20 women aged between 20-69 years who withdrew from the NCSP Register during this six-month period. This is fewer than the number of women in this age range who withdrew during the previous monitoring period (30 women).

Indicator 4 — Early re-screening

Target: Not yet defined

Currently reporting on the percentage of women in routine screening (previous smear negative and recommended to return in 36 months (3 years) who returned for a smear within 30 months (2.5 years) of their index smear.

- 12.6% 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 6.5% in Tairawhiti to 17.4% in Wairarapa.
- Early re-screening occurs in all ethnic groups, but is most common among European/ Other (13.1%) and least common among Pacific women (9.8%).
- Early re-screening occurs in all age groups, but is most common in women aged 20-24 years at the end of the period (15.3%) and least common in women aged 65-69 years at the end of the period (7.9%).
- Early re-screening has decreased slightly overall since the previous report, from 13.7% to 12.6%.

Indicator 5 — Laboratory Indicators

Indicator 5.1 — Cytology reporting

Unsatisfactory cytology

Target: 0.1% - 3% for LBC

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

Negative cytology

Target: No more than 96% of satisfactory cytology samples

- The target for the percent of samples reported as negative was met nationally (93.5%) and met by all six laboratories.
- Nationally, the percent of samples which are negative is similar to 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 (6.5%) and by four of six laboratories.
- Nationally, the percent of samples which are abnormal is similar to what was reported in the previous period (6.7%).

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 of six laboratories.
- Nationally the percent of HSIL samples (0.7%) was slightly lower than in the last monitoring report (0.8%). This rate has reduced in all ages; however, in women aged 20-24 years this rate is 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

- Five of six laboratories met the target range for HSIL + SC.
- Nationally, the positive predictive value of HSIL + SC was lower in this monitoring period (80.4%) than in the previous report (81.7%).

Other cytological abnormalities

Target: None

- Nationally, the positive predictive value of ASC-H has decreased compared to the previous report (48.3% in this report, 49.7% in the previous report).
- Nationally, the positive predictive value of the combination of ASC-H + HSIL + SC has decreased compared to the previous report (69.5% in this report, compared to 71.5% in the previous report).
- Nationally, the percent of glandular cytological abnormalities identified as histological high-grade has decreased since the previous report, from 46.1% to 40.6% (however this measure is generally based on a comparatively small number of samples; 160 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, 2.6% 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, 5.5% 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

- 12,536 histology samples were taken during the current monitoring period. 446 (3.6%) of these were insufficient for diagnosis.
- Results for most severe histology from 10,561 women with samples which were sufficient for diagnosis are presented.
- 56.8% of women had histology samples which were negative/ benign. This reduced to 45.6% of women when negative/ benign hysterectomy samples (total hysterectomy and partial hysterectomy with cervical component) were excluded.
- 19.5% of women had CIN 2/3 or HSIL histology results.
- 60 (0.57%) women had histology results indicating adenocarcinoma in situ (AIS).
- 55 (0.52%) women had invasive squamous cell carcinoma (ISCC) histology results, 39 (0.37%) women had adenocarcinomas not arising from the endocervix and two women (<0.05%)

adenocarcinoma arising from the endocervix histology results. Three women (<0.05%) had adenosquamous carcinoma histology results.

Indicator 5.5 — Turnaround times

Cytology

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

- The seven-working-days target for cytology was met nationally (96.3%), and was met by five of six laboratories.
- The 15-working-days target was met nationally (99.2%), and was also met in five of six laboratories.
- Performance against the seven-working-days target is similar to the previous report (96.3% in both reports).
- 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 (94.0%).
- The target was not met for reporting within 15 working days (97.2%).
- Targets were met by nine of 14 laboratories (10-working-day target) and six of 14 laboratories (15-working-day target).
- The overall proportion of histology samples reported within 15 days (97.2%) was similar to what was reported in the previous report (97.1%).

Low-grade cytology with associated HPV triage testing

Target: 98% within 15 working days

- There were 2,780 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 (99.0%).
- Five of the six laboratories met the target.

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

Histological follow-up

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

- Targets were not met nationally (for either 90 days or 180 days).
- 83.0% of women had a histology report within 90 days of their high-grade cytology report; 88.3% of women had one within 180 days.

- Three DHBs met the target for histological follow-up within 90 days and no DHBs met the target for 180 days.
- Nationally, the proportion of women with histological follow-up has increased slightly within 90 days (from 82.2% to 83.0%) and decreased at 180 days (from 89.6% to 88.3%) since the previous monitoring period.
- Compared to the previous monitoring period, the proportion of women with follow-up histology within 90 days has increased for Māori women (from 74.3% to 78.9%) and for European/ Other women (from 84.4% to 85.7%), and decreased for Pacific (from 77.8% to 68.6%) and Asian women (from 80.6% to 77.6%).
- The proportion of women with follow-up histology within 180 days has increased for Māori women and decreased for Pacific, Asian and European/ Other women.

Women with no follow-up tests

Target: None

- Nationally, 149 (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 100 (5.7%) women have no follow-up test report within 180 days.
- Nationally, there was a decrease in the proportion of women with no record of a follow-up test report at 90 days (from 9.5% to 8.5%) while the proportion remained similar for 180 days (from 5.2% to 5.7%).
- Compared to the previous monitoring period, the proportion of women with no follow-up test recorded at 180 days has increased for Māori (from 8.6% to 9.5%), Pacific women (from 6.7% to 10.5%) and Asian women (from 5.6% to 7.1%), and remained similar for European/ Other women (from 4.4% to 4.3%).

Indicator 7 — Colposcopy

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

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

- There were 1,749 women with high-grade cytology results who were not already under specialist management (the same women reported on in Indicator 6).
- This comprised 73 women with high-grade results indicating a suspicion of invasive disease and 1,676 women with other high-grade results.

- Nationally, the proportion of women with accepted referrals recorded on the NCSP Register is similar to the previous report (from 88.0% to 88.2%).

Suspicion of Invasive Disease

- Among the 73 women with high-grade cytology results indicating a suspicion of invasive disease, 40 (54.8%) had an accepted referral. Of the women with an accepted referral, 65.0% were seen within 10 working days of their referral being accepted. This is lower than in the previous report (90.0%).
- A colposcopy visit is recorded for 64 of these women (87.7%) up to 31 December 2017 (follow-up time of at least six and up to 12 months).

No Suspicion of Invasive Disease

- Among the 1,676 women with other high-grade cytology results, 1,502 (89.6%) had an accepted referral. Of the women with an accepted referral, 75.6% were seen within 20 working days of their referral being accepted. This is higher than the proportion seen within 20 working days in the previous monitoring period (69.6%).
- A colposcopy visit is recorded for 1,579 (94.2%) of these women up to 31 December 2017 (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 3,523 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 2016).
- Subsequent accepted referrals are recorded for 2,990 (84.9%) of these women, and subsequent colposcopy (by 31 December 2017) for 3,207 (91.0%) of these women.
- Nationally, 85.1% of women attended for colposcopy within 26 weeks of their accepted referral. This is higher than in the previous monitoring report (81.4%).

Indicator 7.3 — Adequacy of reporting colposcopy

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

- Based on 12,117 colposcopy visits 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 92.2% of colposcopy visits.
- The type of recommended follow-up was recorded for 95.1% of colposcopy visits, and the recommended timeframe for this follow-up was recorded for 94.3% of colposcopy visits.
- Colposcopic appearance was reported as abnormal in 54.4% of colposcopies, and inconclusive in 5.0% 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 reporting period (92.2%) to the previous monitoring period (92.6%).
- The number of colposcopies recorded on the NCSP Register has decreased slightly by 5.4%.
- All DHBs were reporting colposcopy data electronically to the NCSP Register throughout the current monitoring period.

Indicator 7.4 — Timeliness and appropriateness of treatment

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

- 63.2% of 2,187 women with HSIL histology (CIN 2/3) during the period 1 January to 30 June 2017 have a record of treatment within eight weeks of their histology report.
- The proportion of women with histologically confirmed CIN 2/3 treated within eight weeks of their histology result being reported has increased since the previous monitoring period (from 61.9% to 63.2%).
- No DHBs 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, 1,589 women were treated for high-grade lesions in the period 1 July to 31 December 2016.
- 76.5% of women treated have a record of both colposcopy and cytology within the nine months after their treatment visit. 77.5% have a record of at least a colposcopy visit (with or without cytology) in the same time period.
- Two 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 1,197 women who were eligible for appropriate discharge within 12 months of their treatment (75.3% of all women treated for CIN 2/3). Of these women, 1,027 (85.8%) were discharged to their sample taker within 12 months.
- Eight DHBs met the target of discharging 90% or more women who were eligible for discharge within 12 months.

Indicator 8 HPV testing

Indicator 8.1 HPV triage of low-grade cytology

Target: None set.

HPV triage

- Nationally, 97.4% of women aged 30 years or more with an eligible ASC-US cytology result, and 97.6% 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 1.8% of women with an ASC-US result, and 0.7% of women with an LSIL result; 27 women in total).
- The proportion of women aged 30 years and over who were eligible for HPV triage of low-grade cytology who subsequently received a triage test is similar in the previous monitoring period for women with ASC-US results (97.4%, compared to 97.7% in the previous report) and for women with LSIL results (97.6%, compared to 96.9% in the previous report).

Positive triage tests

- Among women aged 30 years or more with a valid HPV triage test results, 25.5% of women with ASC-US results and 60.1% of women with LSIL results were positive for high risk HPV.
- Positivity for high risk HPV varied by laboratory (from 14.5% to 32.0% for ASC-US, and from 45.0% to 67.9% for LSIL).
- Positivity for high risk HPV generally decreased with increasing age.
- The proportion of women whose HPV tests were positive increased compared to the previous monitoring period for ASC-US (25.5%, compared to 24.8% in the previous period), and LSIL (60.1%, 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, 91.1% of women have a record of colposcopy and 60.6% have a record of histology within 12 months of their triage test. The corresponding percentages for LSIL are 93.5% with colposcopy and 67.2% 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 17.9% for women with ASC-US cytology and 15.2% for women with LSIL cytology. This corresponded to 53 of the women with ASC-US cytology and 114 of the women with LSIL cytology.

- Among women with histology recorded within 12 months of a triage test, 26.9% of women with ASC-US cytology and 21.2% of women with LSIL cytology had a histological outcome of CIN 2+.

Indicator 8.2 HPV test volumes

Target: None set.

- 18,230 cervical samples were received nationally at laboratories for HPV testing during the current monitoring period.
- Nationally, 14.1% of HPV tests were taken for follow-up of women treated for confirmed high-grade squamous abnormalities in the previous four years, 37.1% were taken to manage women with high-grade squamous cytology or histology more than three years ago (historical testing), 6.9% were taken at colposcopy (potentially to assist in resolving discordant results), and 14.7% were taken for HPV triage of low-grade cytology in women aged 30 years or more. The remaining 27.2% of HPV tests did not fit into any of the previously described categories, and so the reason for testing was unclear.
- The proportion of HPV tests which are invalid is very small (0.05%).
- Overall HPV test volumes have decreased by 3.5% since the previous monitoring period. The reduction does not appear to be linked to any particular purpose.

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

Target: None set.

- This analysis followed up 49,293 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 32,799 women (66.5%) with a Round 1 historical HPV test recorded, and 27,024 women (54.8%) with a Round 2 historical HPV test recorded.
- The proportion of women who had received a historical HPV test varied by DHB, from 54.3% to 79.3% for Round 1 tests and from 40.2% to 71.9% for Round 2 tests.
- There was comparatively less variation by age in the proportion of women who had received a historical HPV test. For women aged 25 to 69 years this varied from 53.2% (25-29 years) to 69.6% (60-64 years) for Round 1 tests, and from 40.3% (25-29 years) to 59.1% (60-64 years) for Round 2 tests.
- The proportion of women who had received a historical HPV test varied somewhat by ethnicity, from 46.2% (Pacific women) to 68.7%

	(European/ Other women) for Round 1 tests and from 35.5% (Pacific women) to 57.5% (European/ Other women) for Round 2 tests. • The proportion of eligible women with an HPV test recorded has increased since the previous report from 64.9% to 66.5% for Round 1 tests, and from 52.1% to 54.8% for Round 2 tests.

2. Background

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

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

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

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

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

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

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

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

3. Methods

Data used

The analyses in this report are based on data extracted from the NCSP Register on 22 February 2018.

Age

Unless otherwise specified, age is defined as the woman's age at the end of the monitoring period, i.e. the women's age at 31 December 2017.

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 (both total and partial) in the New Zealand population, modelled by Alistair Gray [1], and are the adjustors recommended by the Health and Disability Intelligence Unit within the Ministry of Health. Hysterectomy incidence was estimated by fitting models to observed data on hysterectomies obtained from public and private hospital discharge data and estimates of the usually resident female population from Statistics New Zealand. 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 (1988 to 2017). The 31 December 2017 estimates that were employed in this monitoring report have been updated to include actual hysterectomy data to 31 December 2016 (supplemented by NZ Health Survey data) in five-year age groups to better reflect the hysterectomy prevalence in the population and have been projected forward using the same method previously. A known limitation of these estimates of hysterectomy prevalence is that they do 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). These limitations may be mitigated by the fact they are working in opposite directions, and that some women who emigrate from New Zealand do return later in their lives.

The hysterectomy prevalence data were applied to New Zealand population estimates from Statistics New Zealand (projection based on 2013 Census data) so that estimates of the number of women in the New Zealand population (by age and ethnicity) who had not had a hysterectomy prior to 31 December 2017 were obtained. Hysterectomy prevalence figures for the whole population (the denominator) were age-specific hysterectomy adjustments and were applied

equally across 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 were the female 2013 Census population, projected to 31 December 2017. These population projection estimates were also updated to include the new hysterectomy adjustor in the current report.

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 early September 2017) contained ethnicity codes for approximately 99.0% 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.[2, 3] 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 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 1.1 – 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*** 928,518 (74.8%) women aged 25-69 at the end of the current monitoring period (31 December 2017) had at least one cervical sample taken during the previous three years. This does not yet meet the target of 80%. 1,099,837 (88.6%) 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 Māori, Pacific, or Asian women. Coverage among women aged 25-69 years in these groups was 62.0%, 73.4% and 63.4% respectively. The coverage target was achieved among European/ Other women (80.4% of eligible European/ Other women aged 25-69 screened) (Figure 1, Table 24). Coverage for each of Māori, Pacific, Asian or European/ Other women was also explored at the DHB level. Three-yearly coverage for Māori women ranged from 50.9% (South Canterbury) to 71.9% (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 56.2% (Northland) to 92.4% women in (South Canterbury) (Figure 5). The target level of 80% of Pacific women screened within the previous three years was achieved by two DHBs (South Canterbury, Wairarapa). Three-yearly coverage in Asian women ranged from 52.2% (West Coast) to 77.4% (Hutt Valley) (Figure 6). The target level of 80% of Asian women screened within the previous three years was not met in any DHB. Three-yearly coverage for European/ Other women ranged from 76.5%

(Counties Manukau and Wairarapa) to 87.8% (Bay of Plenty) (Figure 7). The target level of 80% of European/ Other women screened within the previous three years was achieved in nine DHBs (Auckland, Bay of Plenty, Capital and Coast, Lakes, Nelson Marlborough, Southern, Tairawhiti, Taranaki, Waikato).

The target coverage of 80% of women screened at least once within the previous three years was achieved in one out of the nine five-year age groups between 25 and 69 years (women aged 45-49 years). The target was not achieved for the five-year age groups between 25 to 44 and 50 to 69. Among women aged 25-69 years at the end of the period, coverage was lowest for women aged 25-29 years (60.8%) and was highest for women aged 45-49 (80.5%) (Figure 2, Table 25). Coverage was also low for women aged 20-24 years (47.5%), 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 70.6% (Auckland) to 81.0% (Taranaki). Three of the 20 DHBs achieved the 80% target for women aged 25-69 years at the end of the period (Figure 3, Table 23).

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 83.8% for Auckland to 94.1% for Nelson Marlborough (Figure 8, Table 26); by age from 73.8% for women aged 25-29 years to 95.1% for women aged 45-49 years (Figure 9, Table 28) and from 73.7% (Asian) to 94.4% (European/ Other) (Figure 10, Table 27). Five-yearly coverage for Māori women ranged from 64.1% (South Canterbury) to 90.3% (Hawke's Bay) (Figure 11, Table 29). Five-yearly coverage for Pacific women ranged from 68.7% (Northland) to all women (Wairarapa) (Figure 12, Table 29). Five-yearly coverage for Asian women ranged from 58.1% (West Coast) to 89.7% (Hutt Valley) (Figure 13, Table 29). Five-yearly coverage in European/ Other women ranged from 90.5% (Counties Manukau) to all women (Bay of Plenty and Capital & Coast) (Figure 14, Table 29). Coverage was estimated to be over 100% of the eligible population in some cases (Table 29); 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 5,682 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 the 31 December 2017. This represents 0.5% of women who were screened at any age (Table 31).

The number of women who were aged less than 20 years at the time they were screened varied by DHB from 31 (Tairawhiti) to 1,056 (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 2.0% (Tairawhiti) to 6.0% (Canterbury). Some DHBs screen a relatively low number of women when they are younger than 20 years, but at a comparatively high rate, because their population is small (for example West Coast). Details of screens of women aged less than 20 years by DHB are presented in Figure 15, and Table 30 to Table 32.

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 (89.7%; Table 32). This may represent opportunistic screening of women aged 18-19 years. This proportion varied from 83.3% in South Canterbury to 94.7% 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

Trends in the current report need to be interpreted with some caution, as the eligible population estimates used were updated in the current report to employ updated population projections from Stats NZ and updated estimates of hysterectomy prevalence. This change will have improved the accuracy of the coverage estimates, however it also means that some caution is required in interpreting changes since recent reports, as these may partially reflect differences in the estimates of the eligible population (which increased from 1,214,382 to 1,241,159 women). To aid comparisons with recent reports, the text in this *Trends* section of the current report includes some results generated using the previous population projections and hysterectomy prevalence estimates for the current reporting period ("previous estimates"); however charts use the updated denominator, to allow consistency going forward.

Coverage

Based on previous estimates of the eligible population (1,214,382 women), overall coverage in New Zealand among women aged 25-69 years was 76.5% within the last three years, and 90.6% within the last five years in the current monitoring report compared to 76.4% within the last three years, and 90.3% within the last five years in the previous monitoring report. Therefore, the apparent drop in three and five year coverage in the current report using the updated estimates (74.8% and 88.6% respectively) is due to the change in the eligible population estimates.

By ethnicity, small increases were seen in three-year coverage for Māori and Asian woman using the previous population estimates (from 64.0% to 64.5% for Maori women and 67.2% to 68.4% for Asian women). A slight drop in coverage of 0.6% was seen in Pacific women and coverage in European/ Other women remained relatively similar (decease of 0.1%) from the previous report using previous estimates. Therefore, apparent drops in coverage in the current report are mostly due to the change in the eligible population estimates (Figure 18, Table 36).

Based on the results using the previous estimates, three-year coverage decreased in five DHBs when compared to the previous report. Four of these DHBs showed decreasing coverage over more than one monitoring period (Auckland, Counties Manukau, Hutt Valley and Waitemata) when using previous estimates. Apparent drops in coverage in seven additional DHBs when using updated population estimates appear to be due to the change in the eligible population estimates (these changes were relatively small - generally less than one percentage point). Coverage over the last four monitoring periods using the updated estimates by DHB are shown in Figure 16 and Table 34.

Based on previous estimates of the eligible population, three-year coverage decreased in three of the five-year age groups (women aged 20-24, 25-29, and 50-54 years), and the 50-54 years age group fell slightly below the target in this report. These decreases were quite small, however, with a change of less than one percentage point. Small increases or no change was seen in the remaining age groups. Apparent decreases in coverage in an additional six age groups using the updated estimates (five-year age groups between 30-49 and 55-64 years) therefore appear to be due to the change in the eligible population estimates. Trends over the last four monitoring periods using updated population estimates are shown in Figure 17 and Table 35).

Screens in women aged less than 20 years

The number of women screened who were aged under 20 years has decreased from 6,076 in the previous monitoring period to 5,682 in the current monitoring period, and the proportion of all women with screening events who were aged less than 20 years at the time of the event is slightly lower (at 0.5% in this report compared to 0.6% in the previous report). The number of women screened who were aged less than 20 years at the time of their cervical sample has decreased in all of the 20 DHBs over the last two monitoring periods (Figure 19).

The proportion of these women who were aged 18-19 years has remained similar to the previous monitoring period (89.7%, compared to 89.6% previously), with small increases occurring in 9 of 20 DHBs (Figure 20). 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 this report, and this change means that differences in coverage compared to reports prior to this report should be interpreted with caution, as these may partially reflect differences in the population estimates. When these differences were taken into account, three-year coverage was similar to that in the previous report, and this was also broadly the case for the different ethnic groups, age groups and DHBs with a general increasing coverage in most cases.

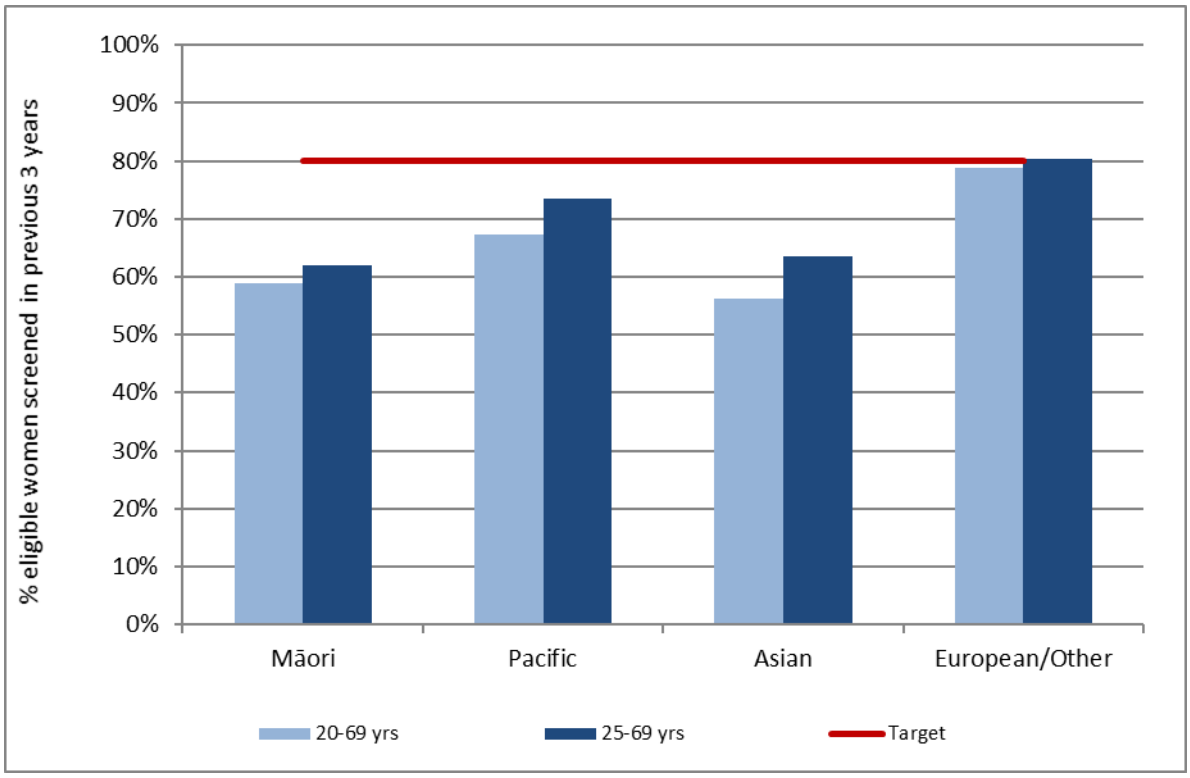
As discussed in the *Methods* section of this report (Hysterectomy-adjusted population; page 14), the hysterectomy prevalence estimates used to make the adjustment includes all women with a hysterectomy, some of whom may still require cervical screening. These women will have been removed from the denominator, 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 33.

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.

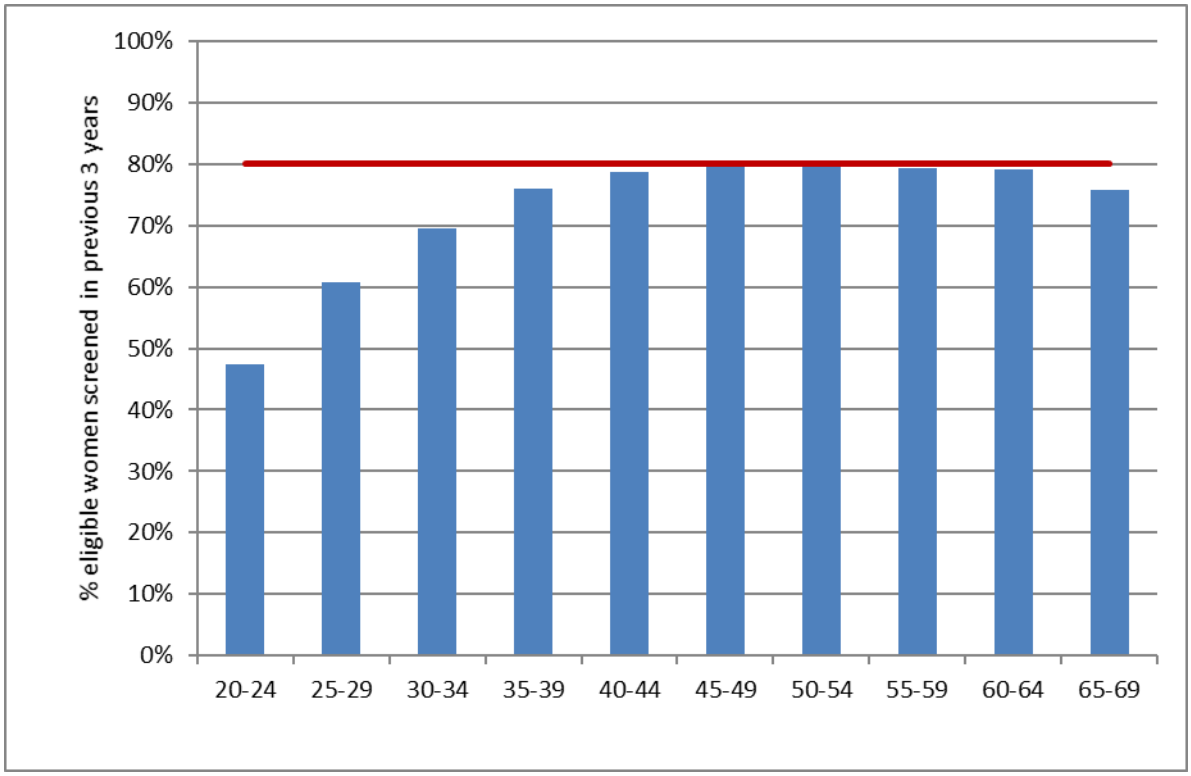
Coverage in women aged 20-24 years is likely to remain lower than for other ages and coverage in this age group should be interpreted with caution, as many women will have had a shorter period in which they were eligible for screening. In 2019, National Cervical Screening Programme will be changing the 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.[4] 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 2017, as a proportion of hysterectomy-adjusted female population)



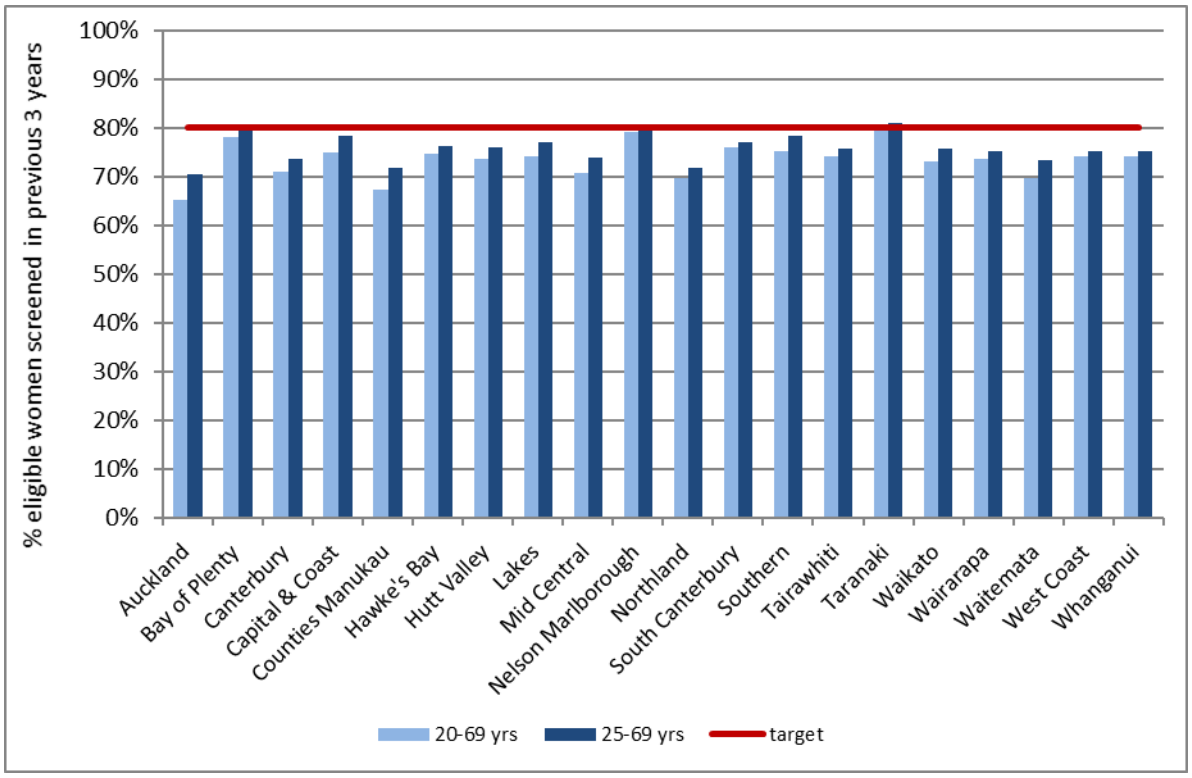
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. Target: 80% for ages 25-69 years, hysterectomy adjusted. See also Table 24.

Figure 2 - Three-year coverage by five-year age group (women 20-69 years screened in the three years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population)



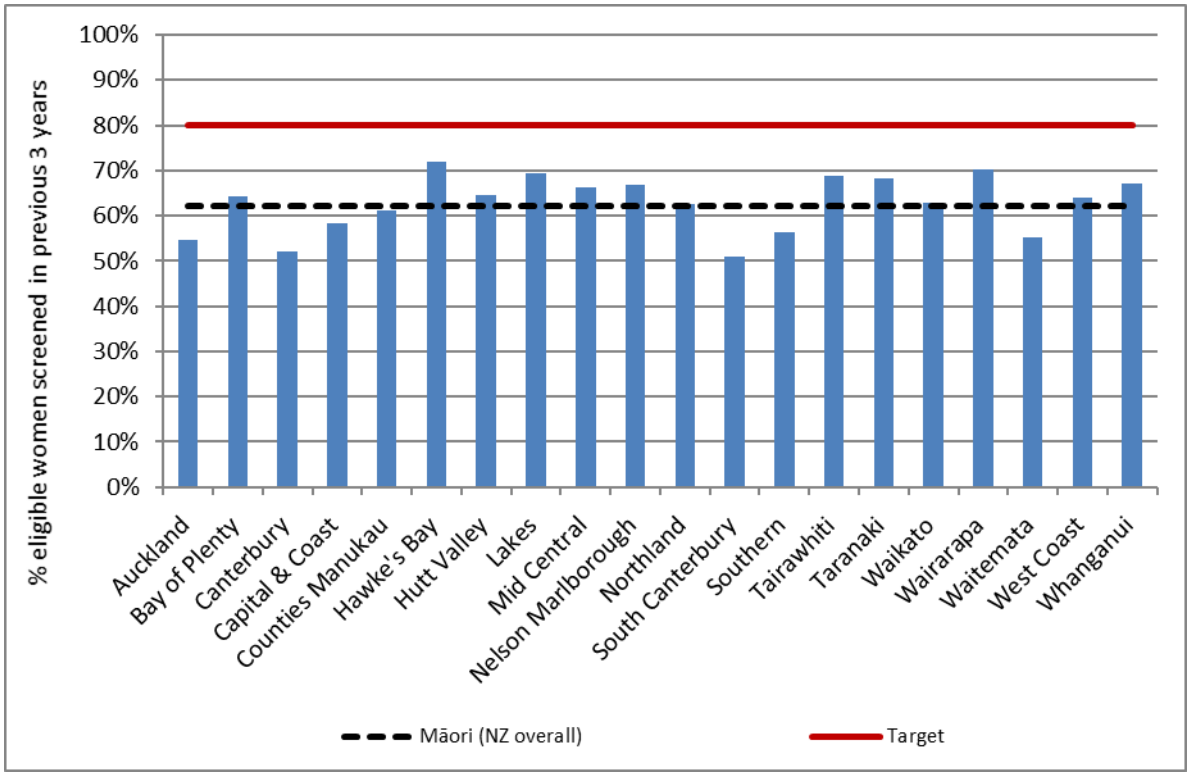
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. Target: 80% for ages 25-69 years, hysterectomy adjusted. See also Table 25.

Figure 3 - Three-year coverage by DHB (women 25-69 years screened in the three years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population)



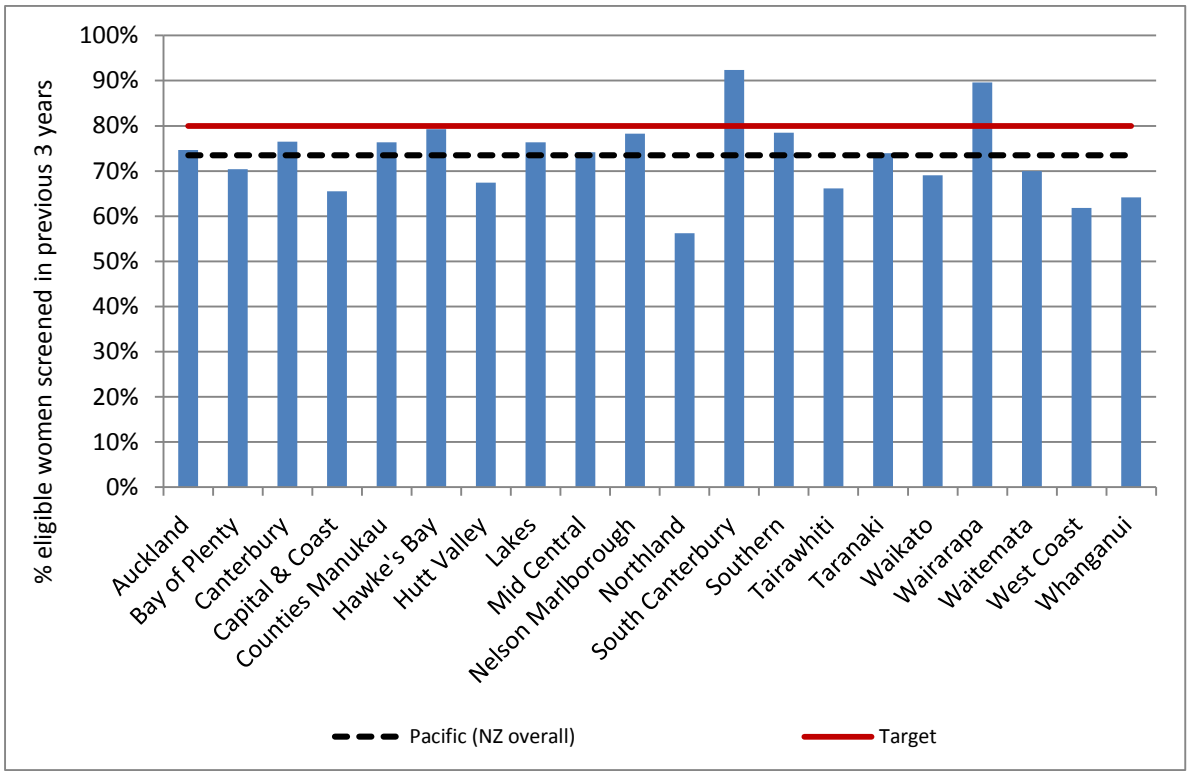
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. Target 80%, hysterectomy adjusted. See also Table 23.

Figure 4 - Three-year coverage in Māori women (women 25-69 years screened in the three years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



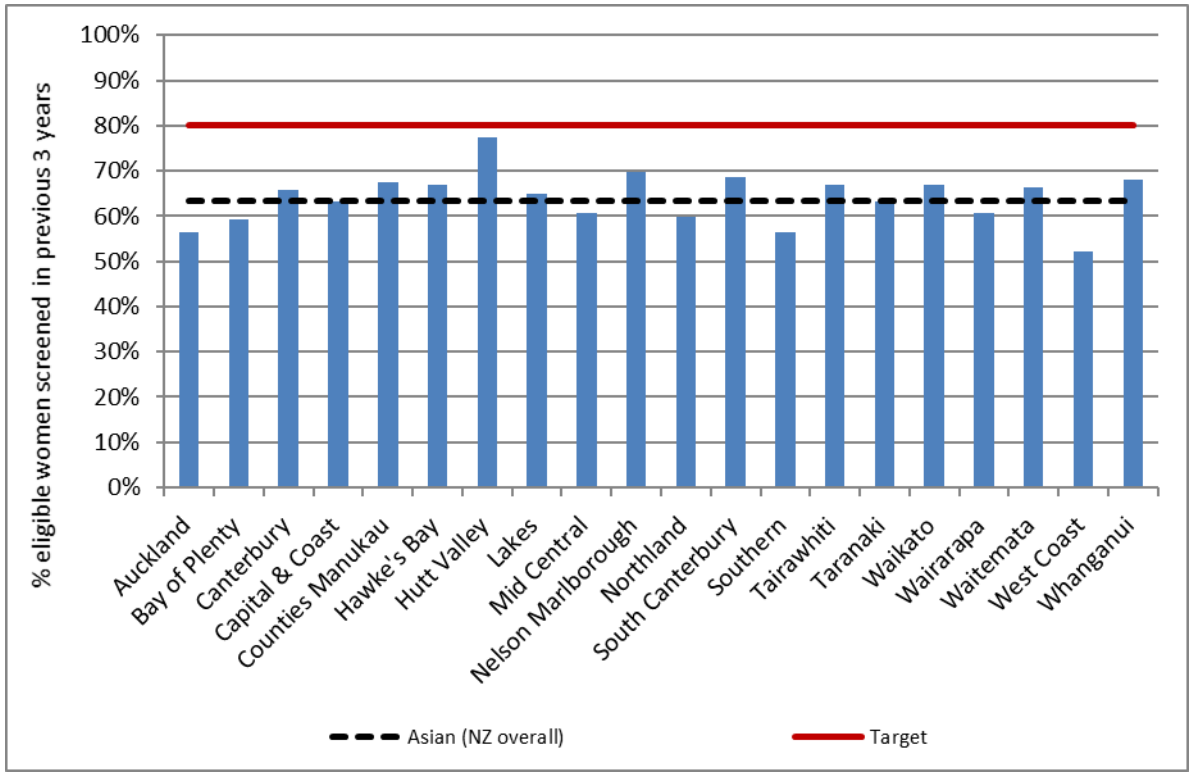
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 5 - Three-year coverage in Pacific women (women 25-69 years screened in the three years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



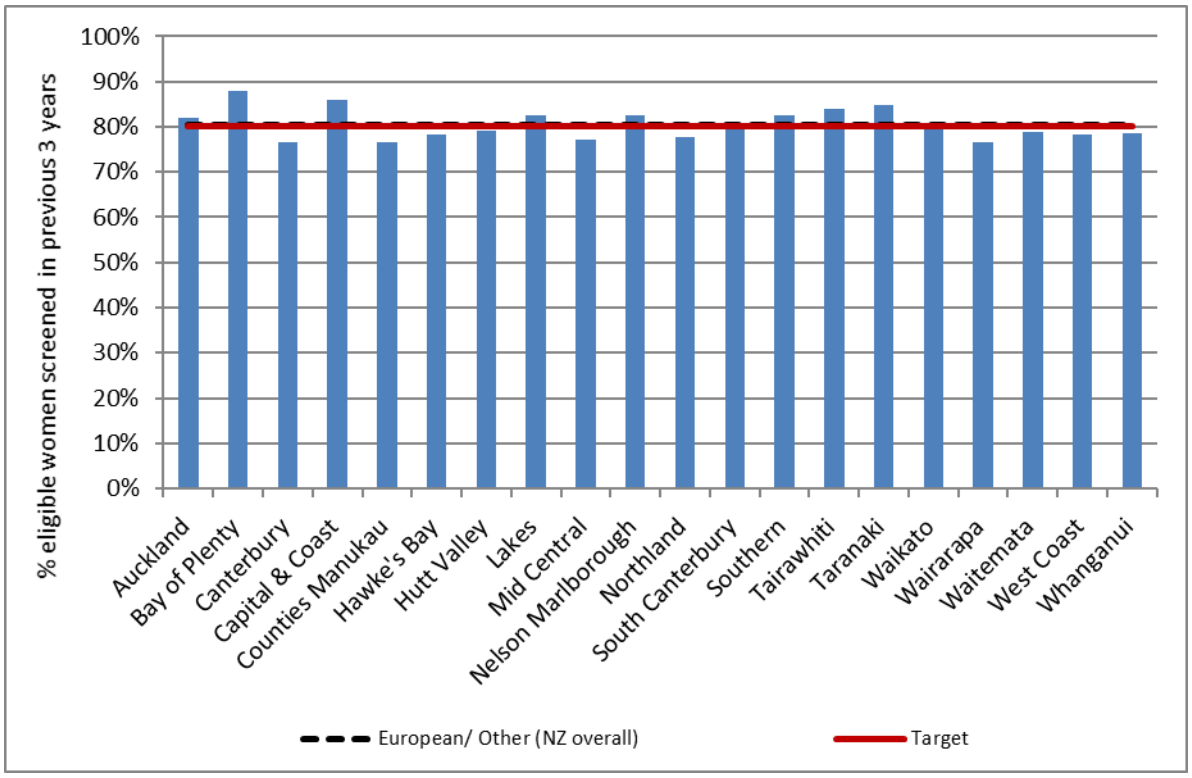
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 6 - Three-year coverage in Asian women (women 25-69 years screened in the three years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



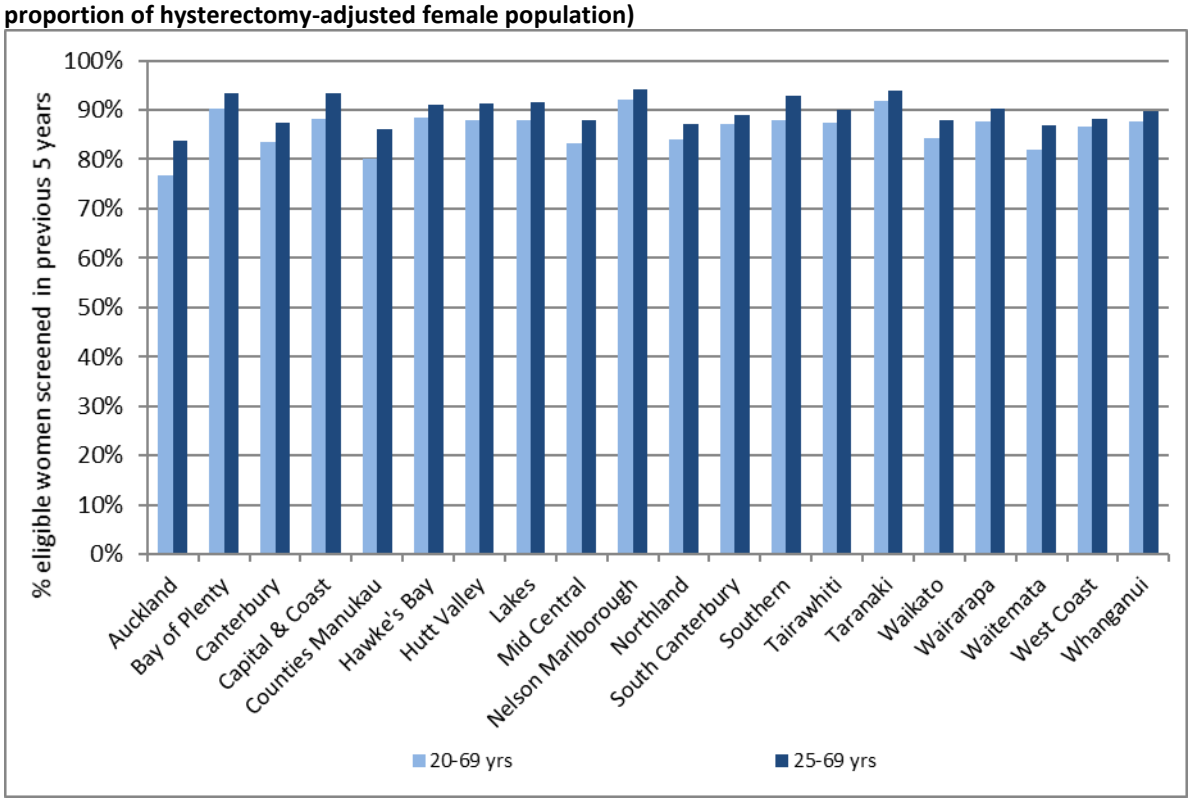
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 7 - Three-year coverage in European/ Other women (women 25-69 years screened in the three years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



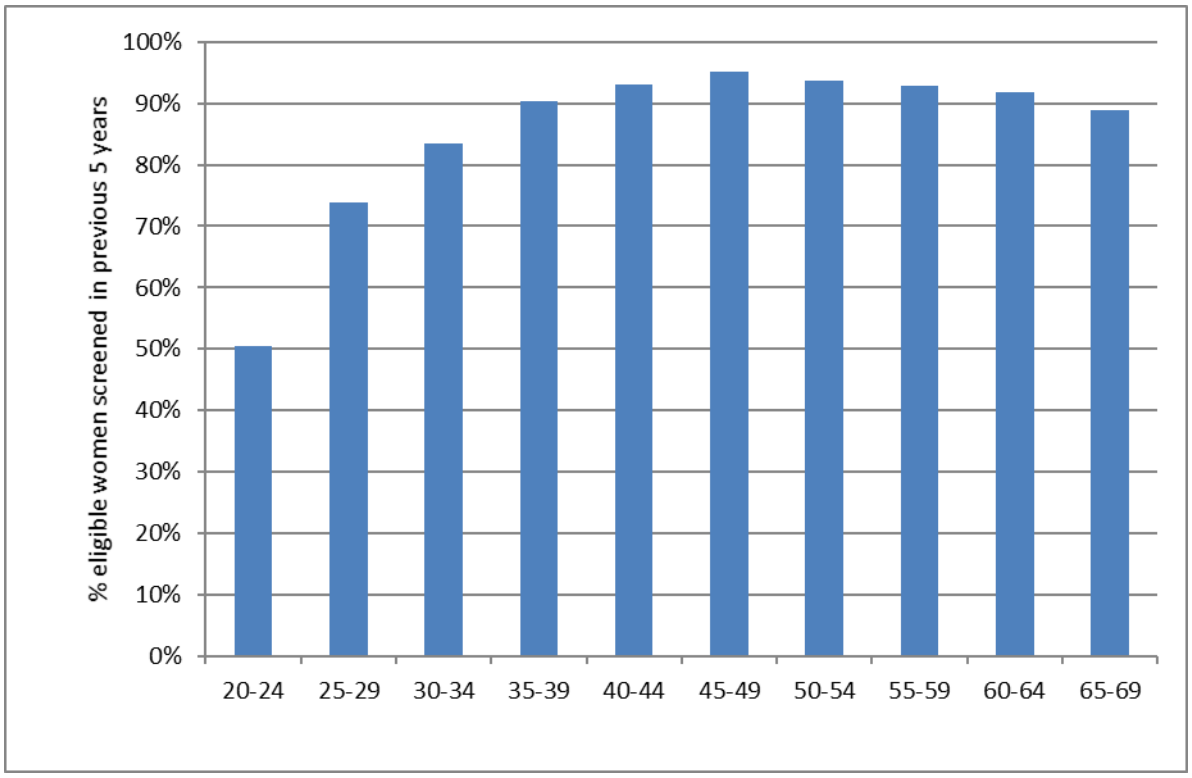
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. Target 80%, hysterectomy adjusted.

Figure 8 - Five-year coverage by DHB (women screened in the five years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population)



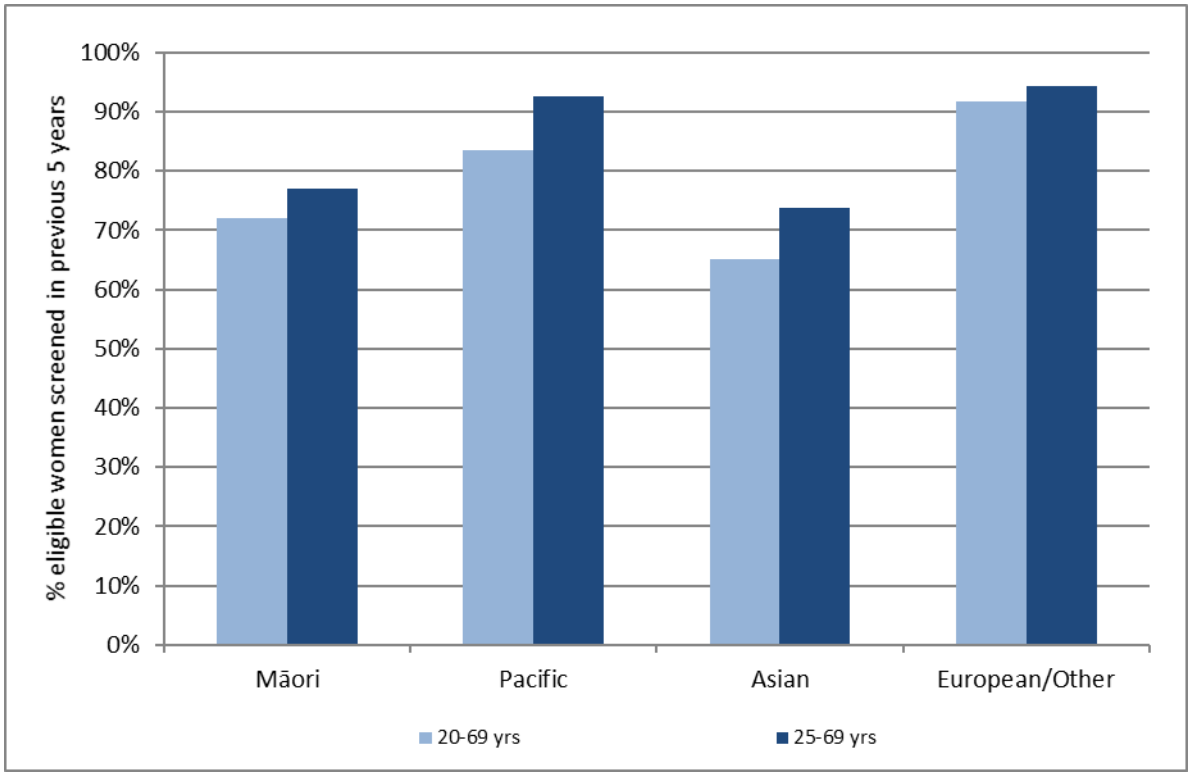
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. See also Table 26.

Figure 9 - Five-year coverage by five-year age-group (women screened in the five years prior to 31 December 2017, as proportion of hysterectomy-adjusted female population)



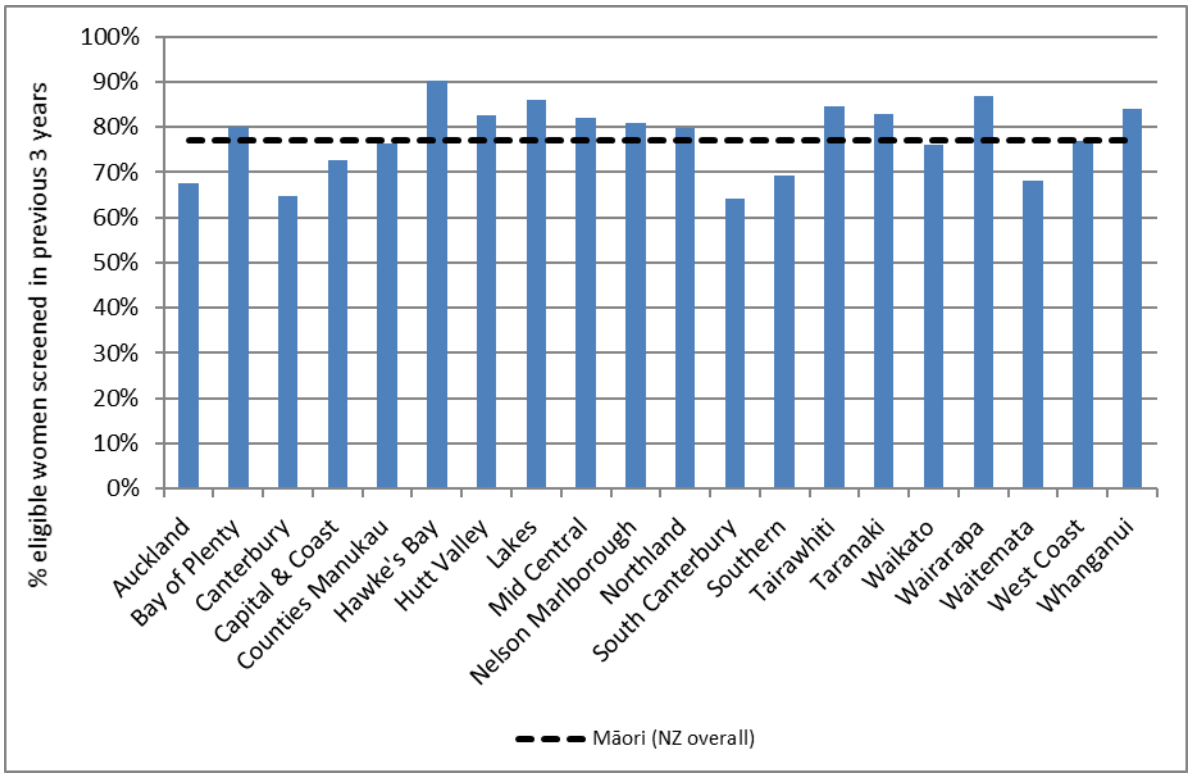
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data. See also Table 28.

Figure 10 - Five-year coverage by ethnicity (women screened in the five years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population)



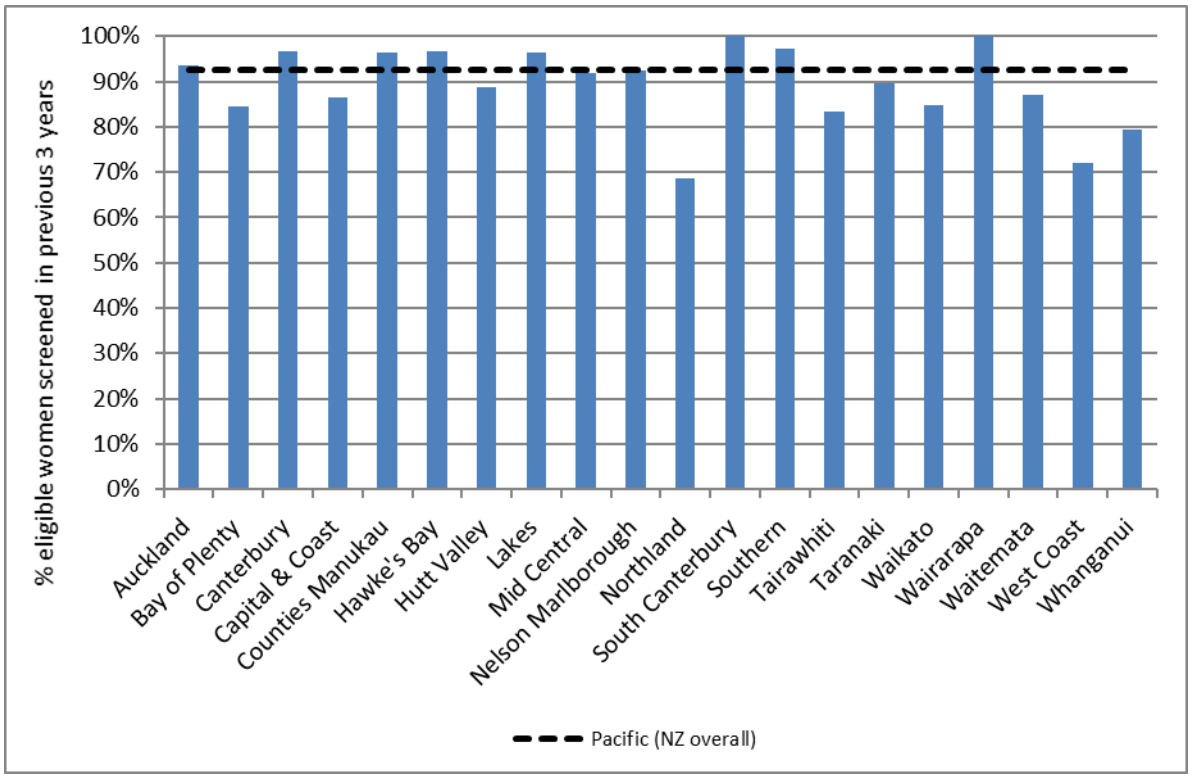
Note: Coverage calculated using population projection for based on 2013 Census data. See also Table 27.

Figure 11 - Five-year coverage in Māori women (women 25-69 years screened in the five years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



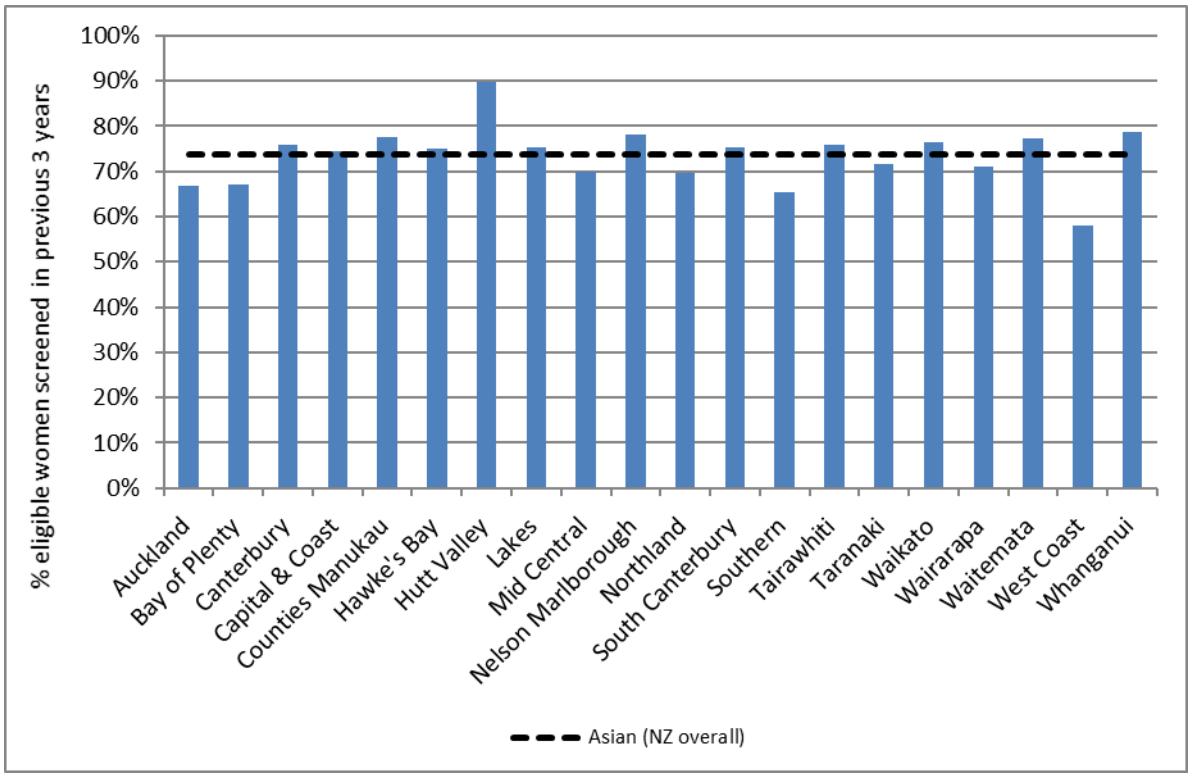
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data.

Figure 12 - Five-year coverage in Pacific women (women 25-69 years screened in the five years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



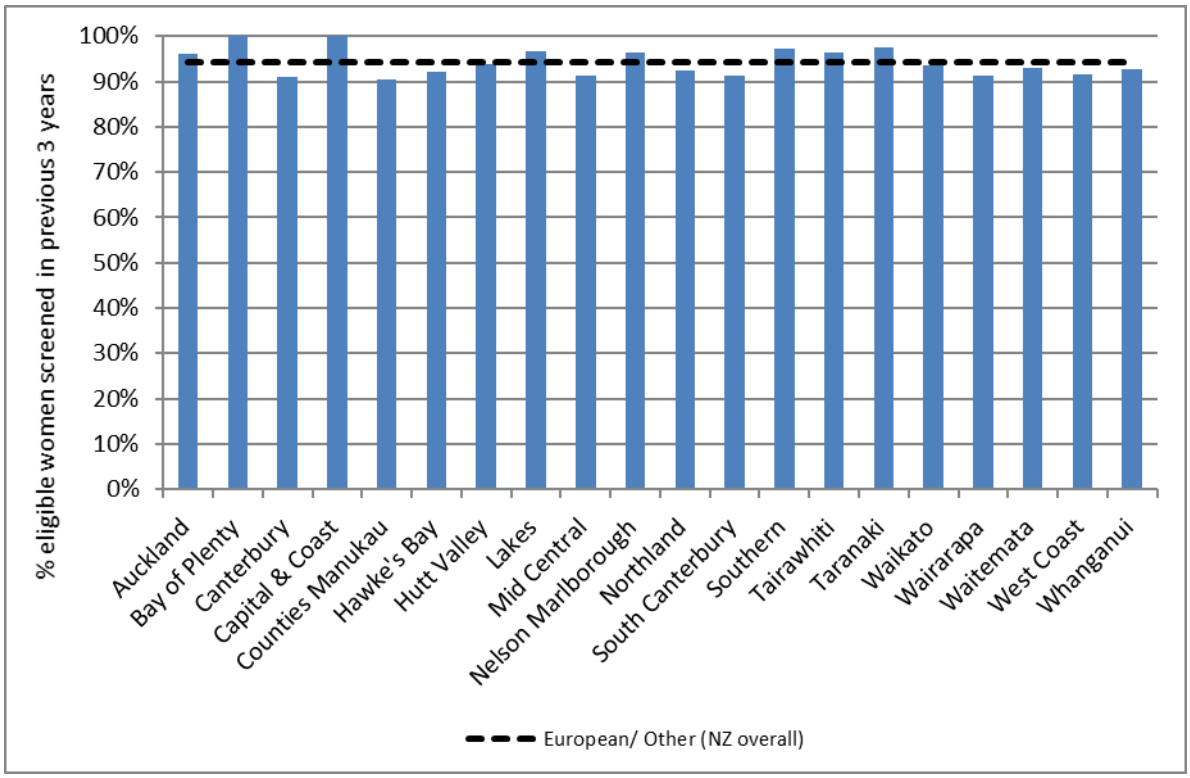
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data.

Figure 13 - Five-year coverage in Asian women (women 25-69 years screened in the five years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



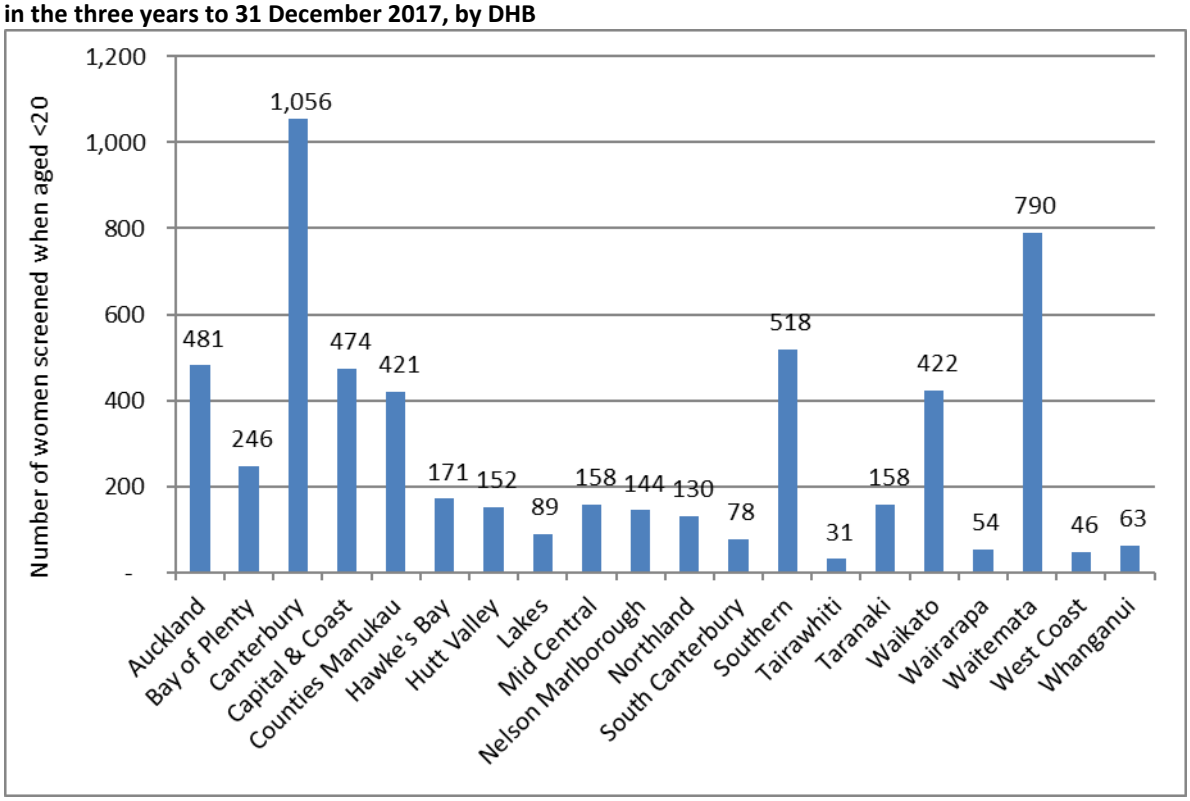
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data.

Figure 14 - Five-year coverage in European/ Other women (women 25-69 years screened in the five years prior to 31 December 2017, as a proportion of hysterectomy-adjusted female population), by DHB



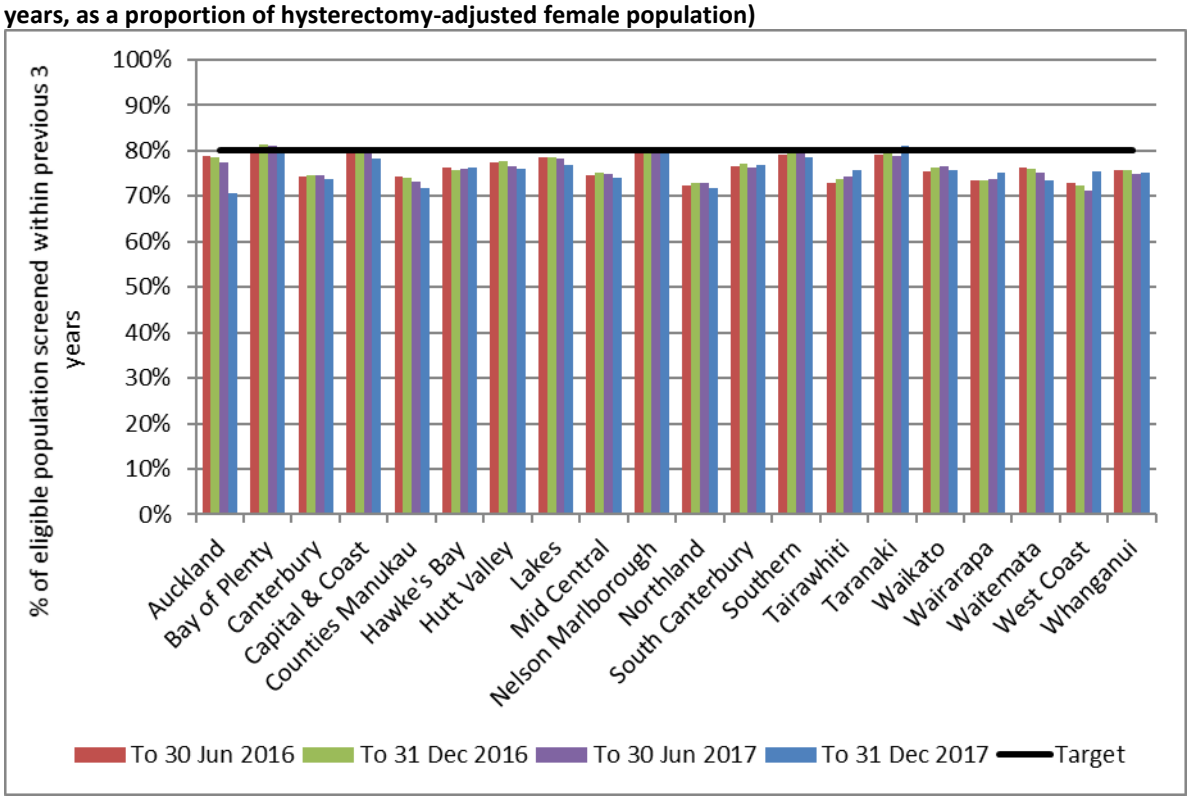
Note: Coverage calculated using population projection for 31 December 2017 based on 2013 Census data.

Figure 15 - 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 2017, by DHB



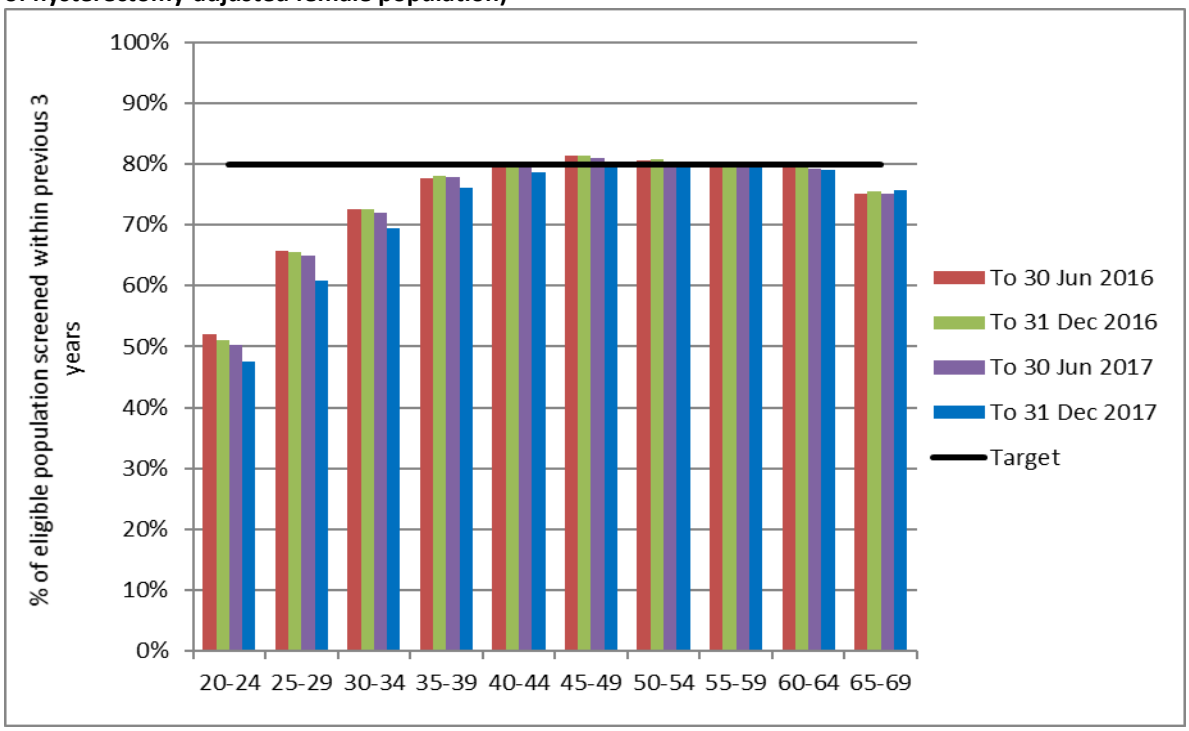
See also Table 30.

Figure 16 - Trends in three-year coverage by DHB (women aged 25-69 years screened in the previous three years, as a proportion of hysterectomy-adjusted female population)



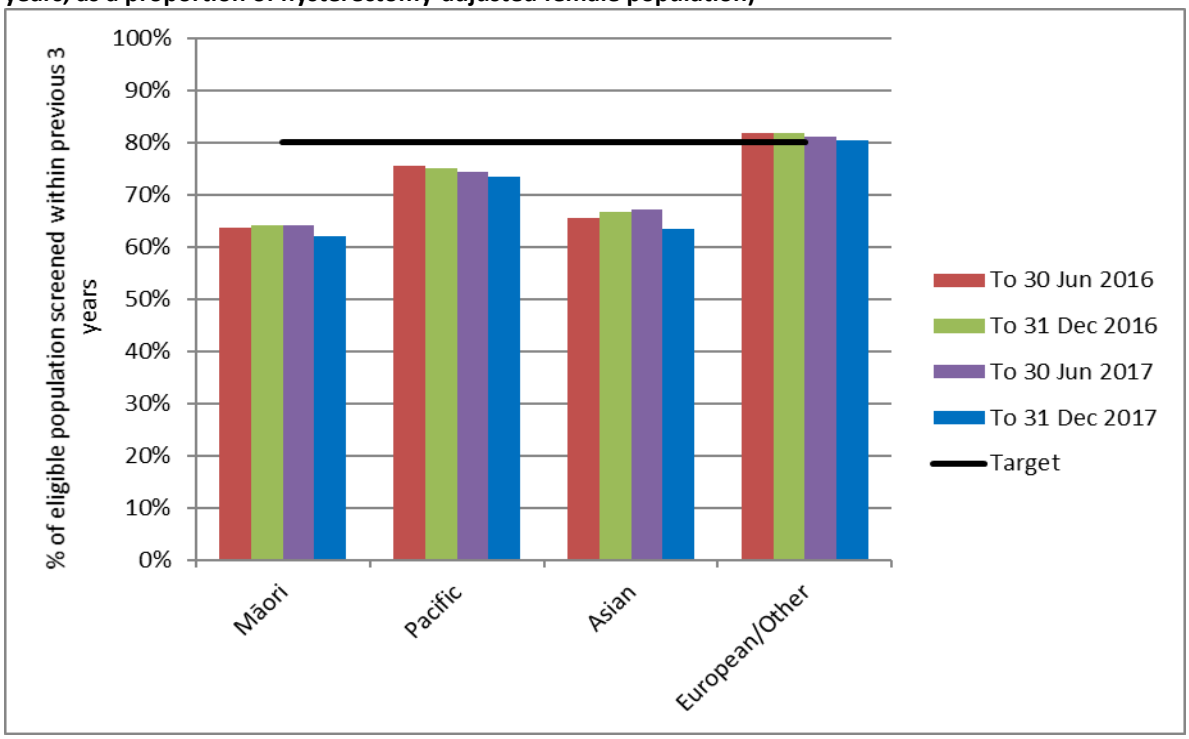
Note: Coverage calculated using population projection at the date shown based on 2013 Census data. Updated population and hysterectomy 2013 Census population projection was used to calculate coverage for 31 Dec 2017. Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.
Target 80%. See also Table 34

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



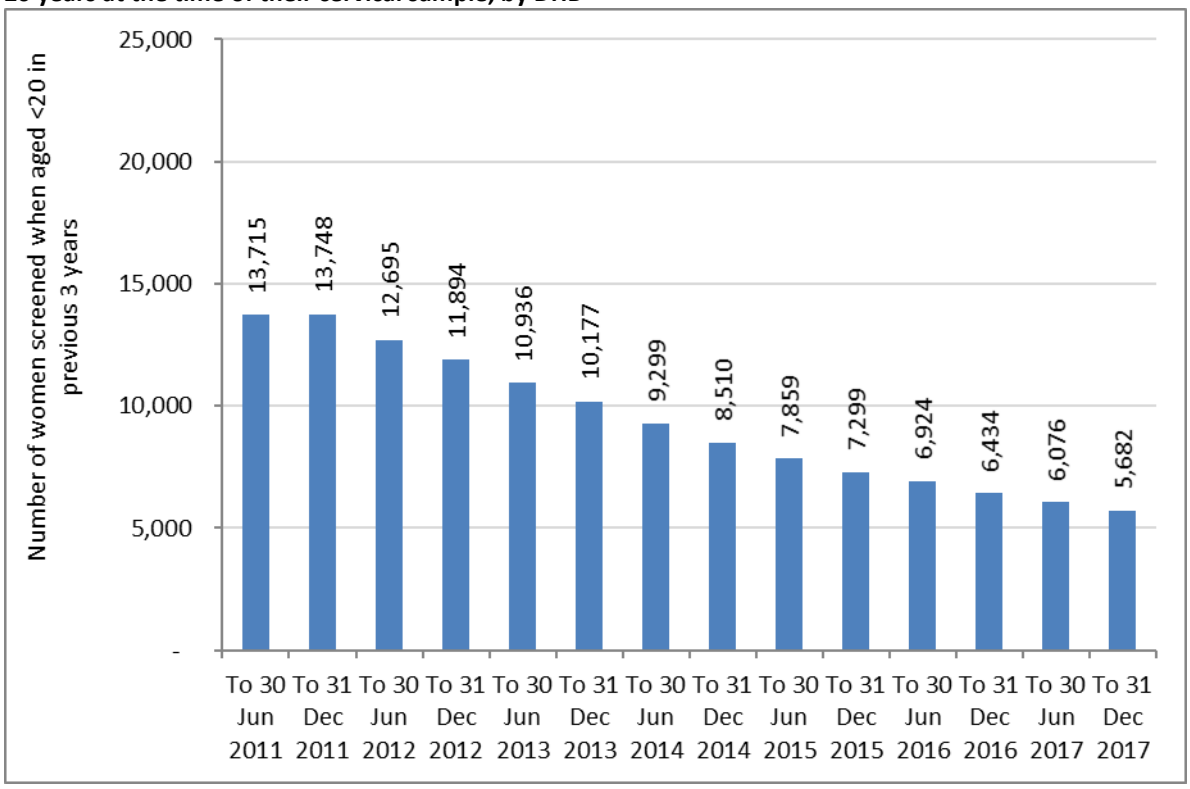
Note: Coverage calculated using population projection at the date shown based on 2013 Census data. Updated population and hysterectomy 2013 Census population projection was used to calculate coverage for 31 Dec 2017. Original population projection estimates were used to calculate coverage for 30 June 2017 and prior. Target 80%. See also Table 35.

Figure 18 - 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)



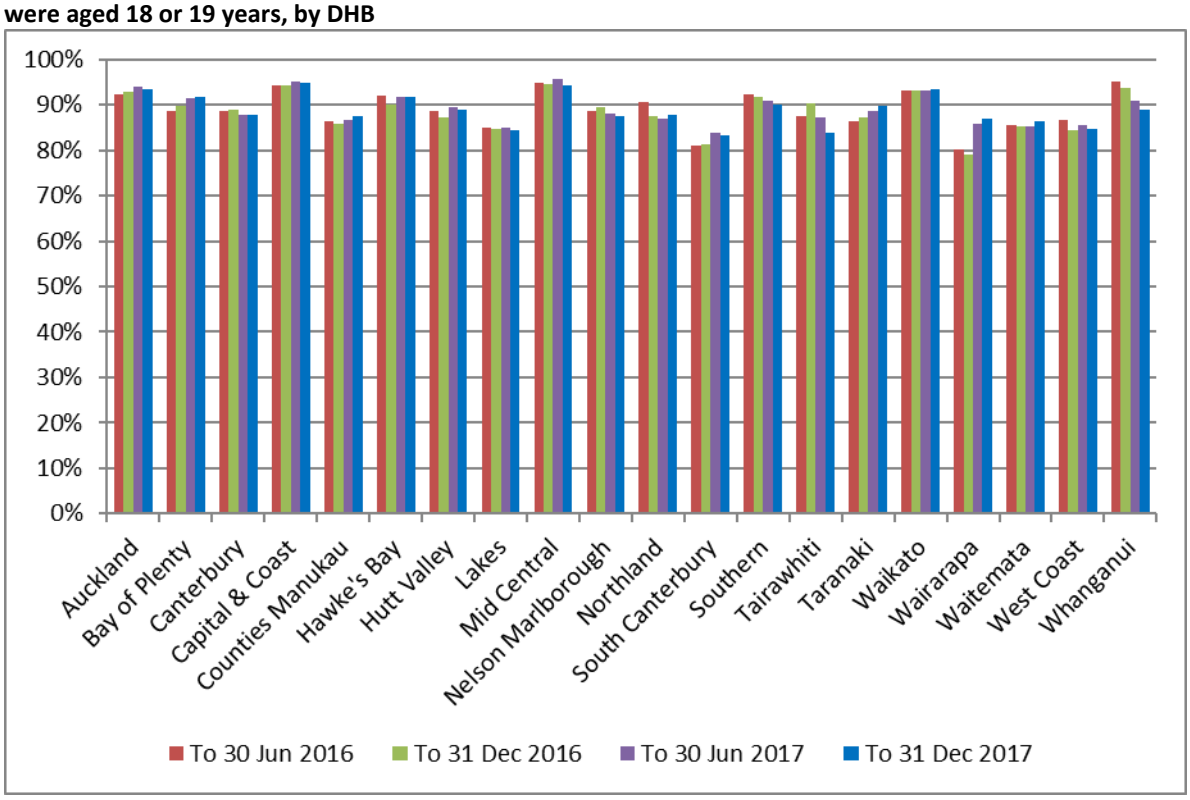
Note: Coverage calculated using population projection at the date shown based on 2013 Census data. Updated population and hysterectomy 2013 Census population projection was used to calculate coverage for 31 Dec 2017. Original population projection estimates were used to calculate coverage for 30 June 2017 and prior. Target 80%. See also Table 36

Figure 19 - 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



Note: Coverage calculated using population projection at the date shown based on 2013 Census data. Target 80%. See also Table 30.

Figure 20 - 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 2017).

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 2015 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 2013-2017, satisfactory cytology samples were collected from 1,211,793 women aged 20-69 years (based on their age at the time of the sample). Of these, 1,083,843 women met all inclusion criteria and 1,702,164 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 2017), while trends over the past five years are described in the *Trends* section. ***Routine screening (3-year recall)*** Among women attending for screening in 2017 following a 3-year recall recommendation, 62.5% were attending on-time; 13.4% more than six months early; and 24.1% more than six months late (Figure 21). *By ethnicity* The proportion of women re-attending in 2017 who were on-time was highest for Asian women (64.1%), and lowest in Māori women (53.8%). The proportion of women returning for routine screening who were re-attending early was highest for Asian women (13.8%) and lowest for Pacific women (10.4%). The proportion of women screened who were re-attending later than recommended was highest for Pacific women (34.4%), and lowest for Asian women (22.1%) (Figure 22). Details of the number of re-attendances in each category are shown in Table 37. *By age* The proportion of women attending for screening in 2017 who were re-attending on-time was highest for women aged 60-69 years (72.7%) and lowest for women aged 20-29 years (54.5%). The opposite pattern was observed for the proportion of women who were re-attending early, which ranged from 8.9% (60-69 years) to 21.6% (20-29 years). The proportion of women screened who were re-attending later than recommended was highest for women aged 30-39 years (30.4%) and lowest for women aged 60-69 years (18.4%) (Figure 23). Details of the number of re-attendances in each category are shown in Table 38. ***12-month re-screening***

Among women attending for screening in 2017 following a 12-month repeat recommendation, 40.5% were attending on-time; 2.4% more than three months early; and 57.1% more than three months late (Figure 24).

By ethnicity

The proportion of women re-attending in 2017 who were on-time was highest for European/ Other women (43.2%), and lowest in Pacific women (30.5%). 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 (2.6%) 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 (67.9%), and lowest for European/ Other women (54.2%) (Figure 25).

Details of the number of re-attendances in each category are shown in Table 39.

By age

The proportion of women attending for screening in 2017 following a 12-month repeat recommendation who were re-attending on-time was highest for women aged 60-69 years (45.0%) and lowest for women aged 30-39 years (36.3%). Very few women were re-attending early; this ranged from 1.8% (50-59 and 60-69 years) to 2.8% (20-29 years). The proportion of women screened who were re-attending later than recommended was highest for women aged 30-39 years (61.4%) and lowest for women aged 20-29 years (52.7%) (Figure 26).

Details of the number of re-attendances in each category are shown in Table 40.

Trends

Routine screening (3-year recall)

Over the period 2013 to 2017, the proportion of women who were screened on-time increased from 58.7% to 62.5%. This predominantly reflected a reduction in the proportion of women who were being screened early (fell from 19.6% to 13.4%). There was a small increase in the proportion of women who were returning late (from 21.6% to 24.1%; Figure 27).

By ethnicity

Over the period 2013 to 2017, the proportion of women who were screened on-time increased in all ethnic groups, with the increase being largest in Asian 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 small increases in the proportion of women who were returning late in every group. The proportion returning late was consistently higher in Māori and Pacific women than in Asian and European/ Other women (Figure 28).

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. 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. While on-time screening was consistently lower for women aged 20-29 years at the beginning of the 5-year period by the end of the observation period the proportion of women that attended screening on-time surpassed the 30-39 age group (Figure 29).

12-month re-screening

Over the period 2013 to 2017, the proportion of women who were re-attending on-time for 12-month follow-up decreased somewhat, from 44.4% in 2013 to 40.5% in 2017, as did the proportion who were re-attending more than three months early, which decreased from 3.5% to 2.4%. 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 52.1% in 2013 to 57.1%. This means that in 2017, 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 30).

By ethnicity

Over the period 2013 to 2017, 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 3.0% in Pacific women (64.9% in 2013 to 67.9% in 2017) and a maximum increase of 5.6% in Maori women (60.9% in 2013 to 66.5% in 2017). 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, and 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 2017, 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 31).

By age

Over the period 2013 to 2017, 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 was comparatively small in women aged 20-29 years (1.9% increase between 2013

	and 2017), whereas it ranged from 3.5% (30-34 years) to 10.8% (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 consistently highest in women aged 60-69 years and consistently lowest in women age 30-39 years. The proportion who were re-attending more than 15 months after a recommendation to return in 12 months was consistently highest in women aged 30-39 years and lowest in women 60-69 years. By 2017, 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 32).
Comments	This indicator is reported on every second reporting 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 2015 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 2016), 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 21 - Timeliness of re-attendance in 2017 following a routine (3-year) repeat screening recommendation

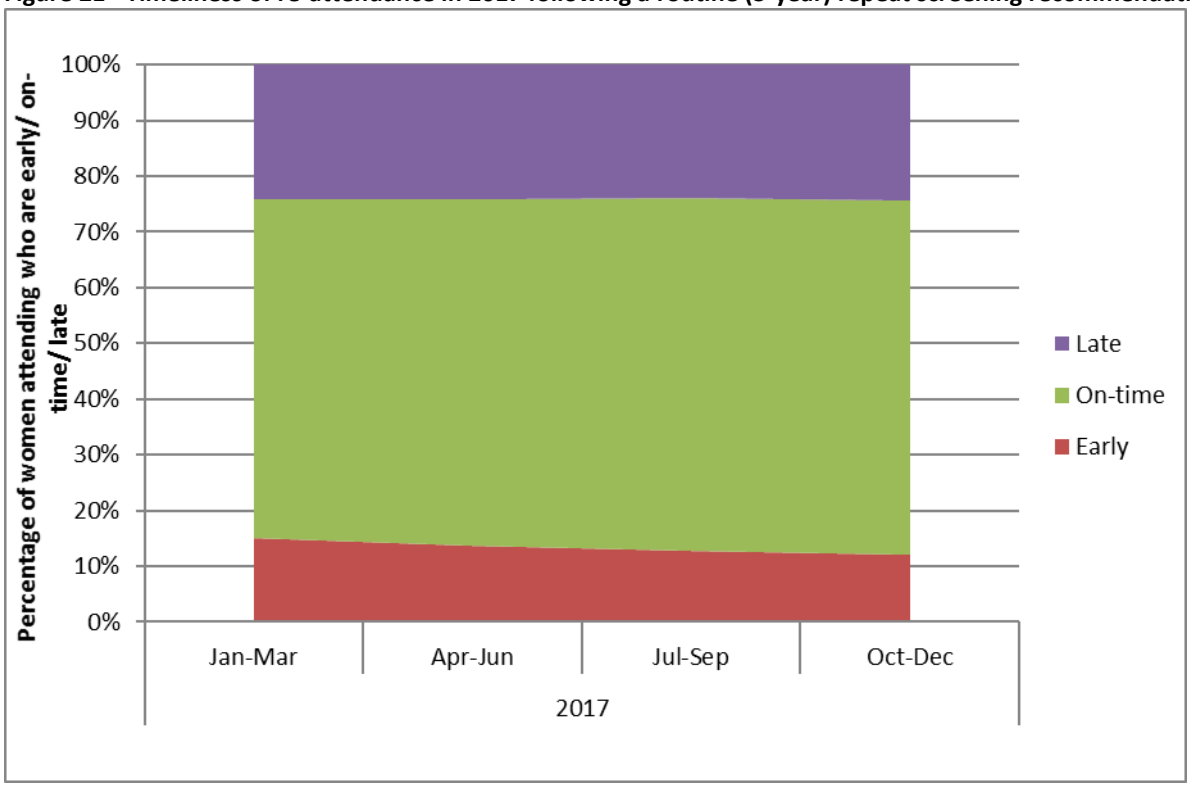


Figure 22 - Timeliness of re-attendance following a routine (3-year) repeat screening recommendation, by ethnicity

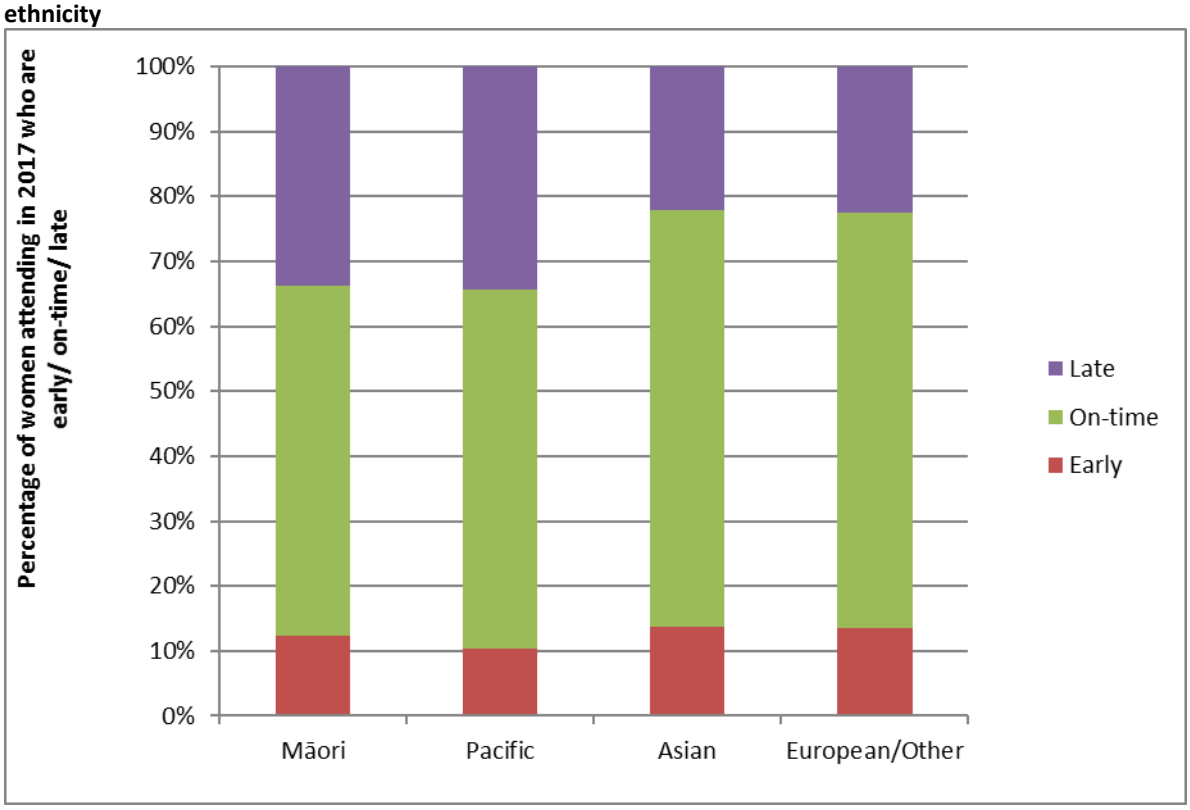


Figure 23 - Timeliness of re-attendance in 2017 following a routine (3-year) repeat screening recommendation, by age

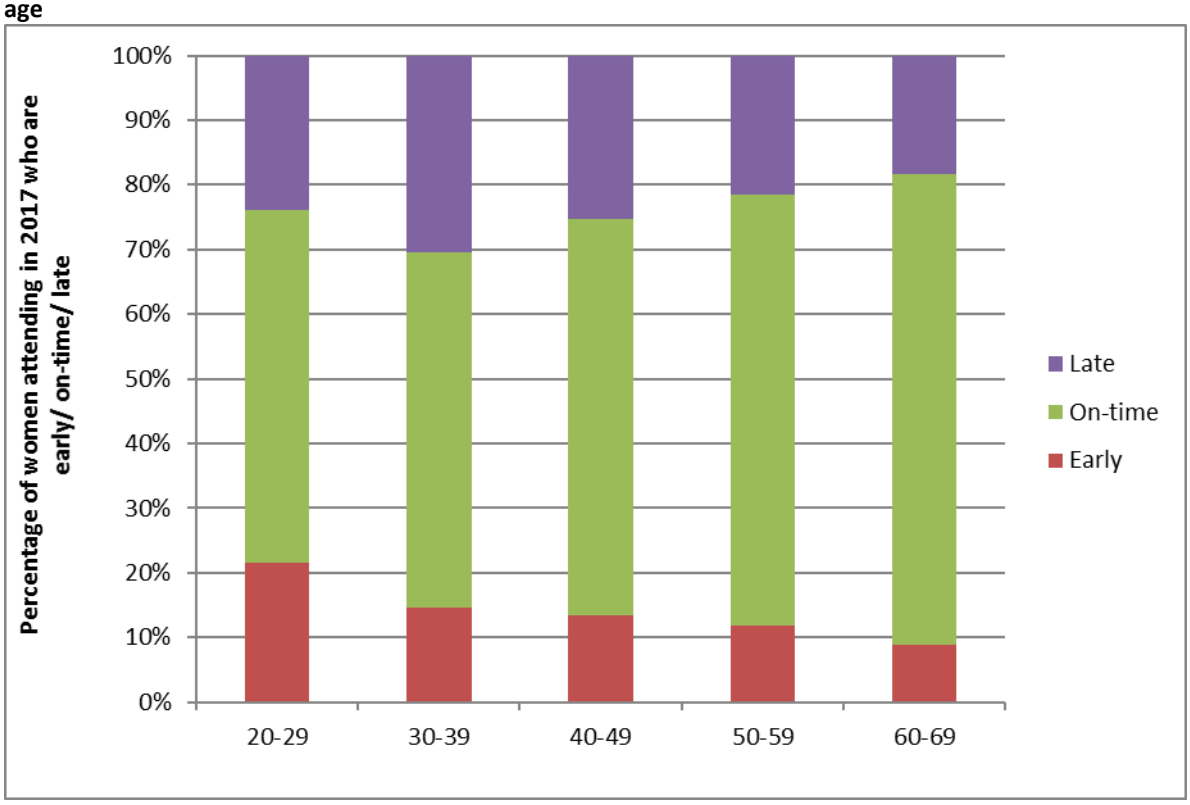


Figure 24 - Timeliness of re-attendance in 2017 following a 12-month repeat screening recommendation

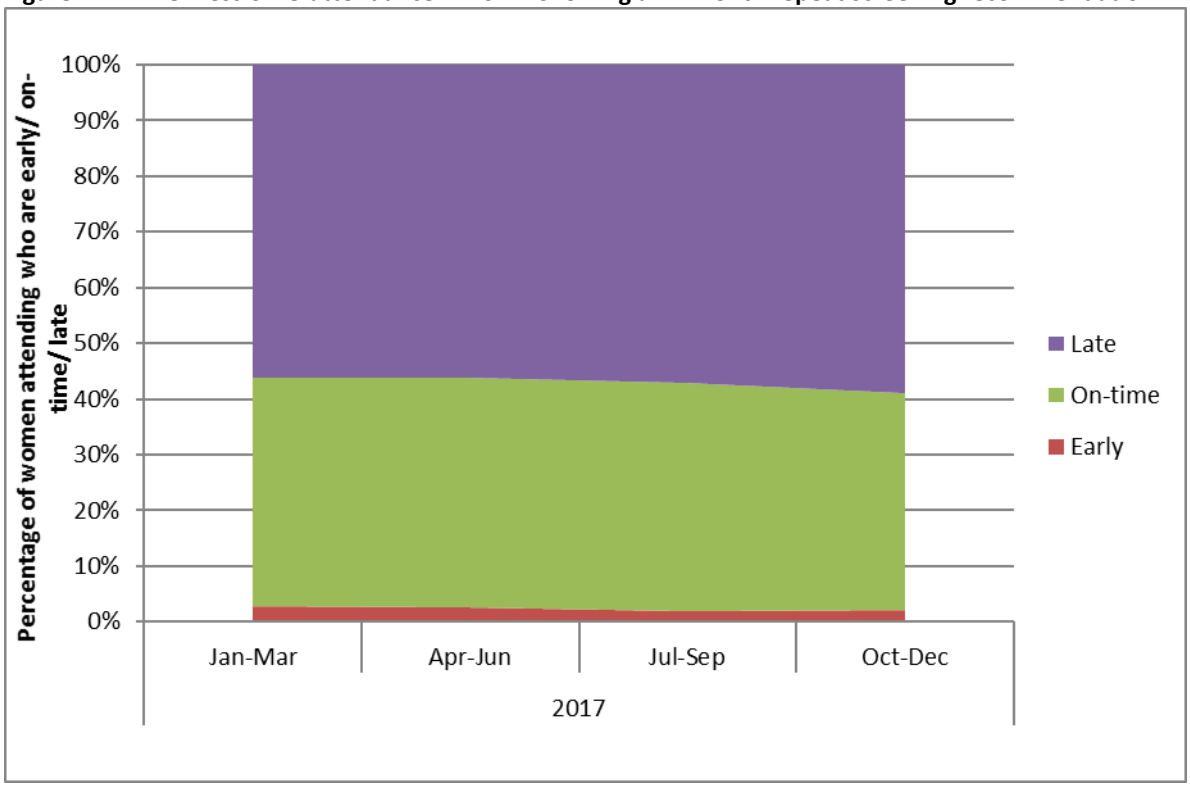


Figure 25 – Timeliness of re-attendance in 2017 following a 12-month repeat screening recommendation, by ethnicity

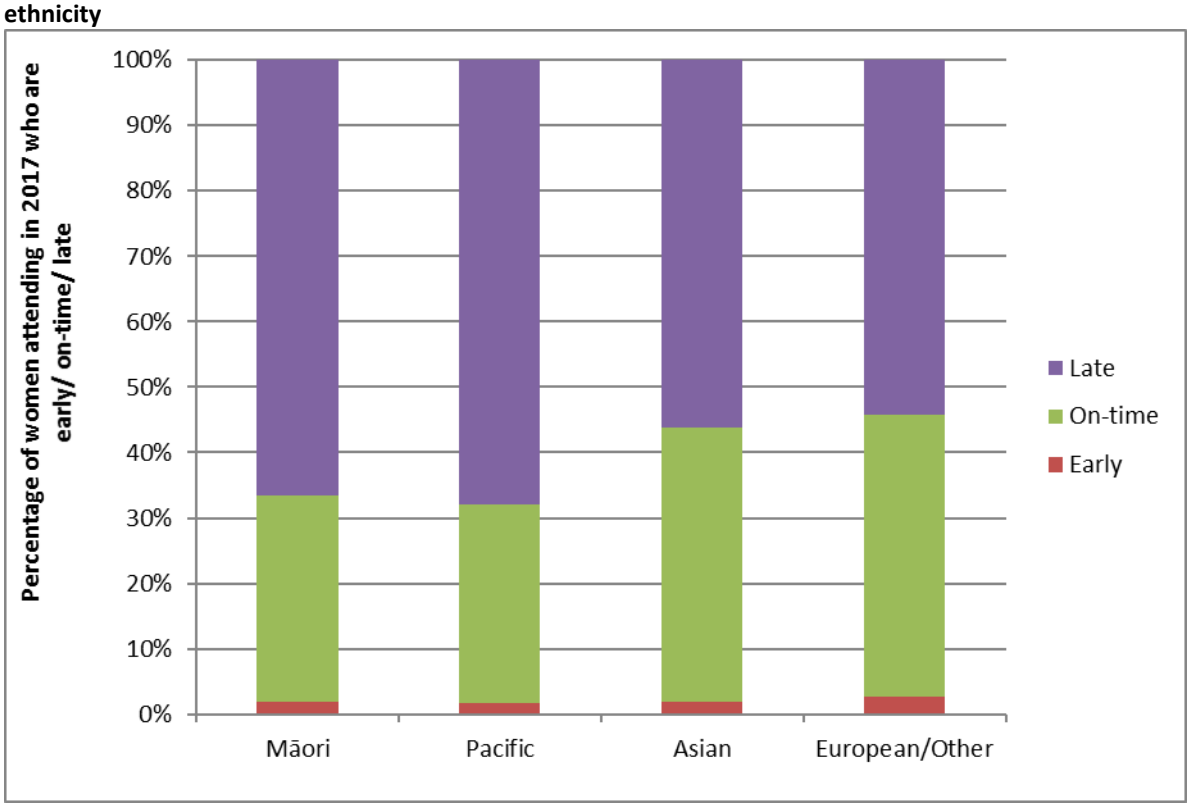


Figure 26 – Timeliness of re-attendance in 2017 following a 12-month repeat screening recommendation, by age

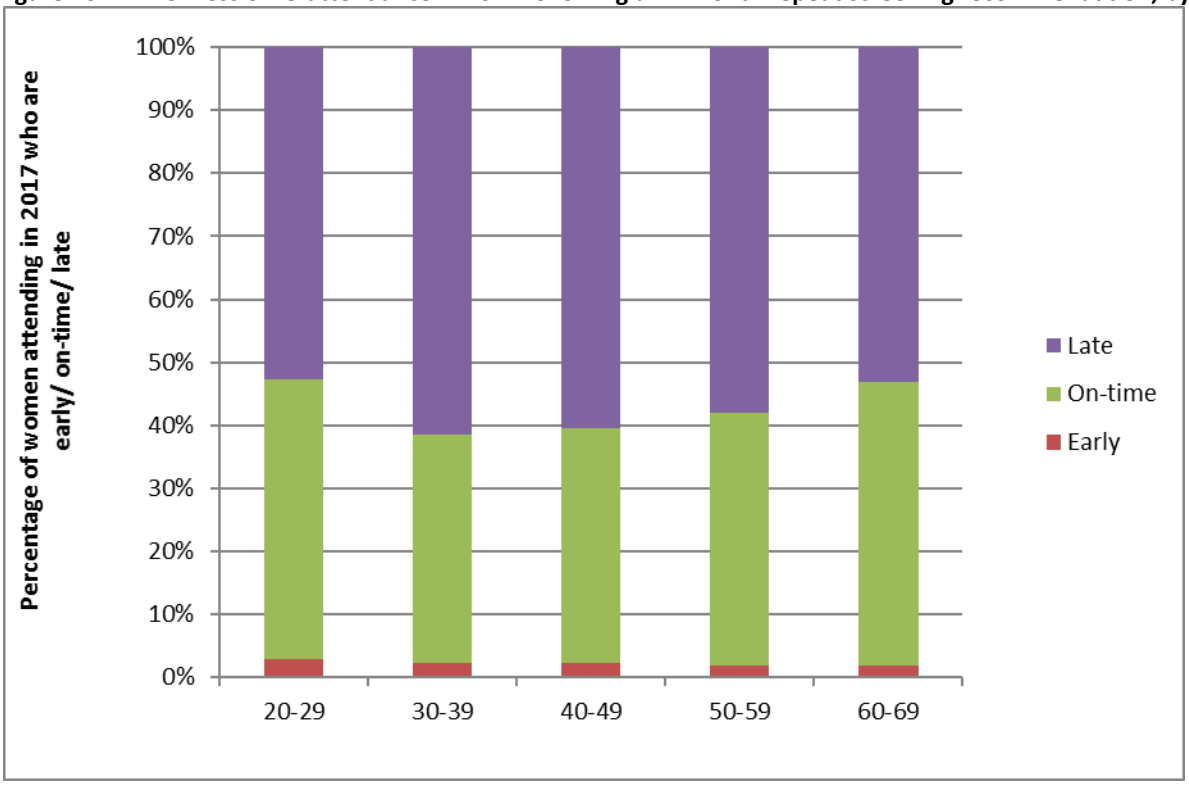


Figure 27 – Trends in the timeliness of re-attendance following a routine (3-year) repeat screening recommendation

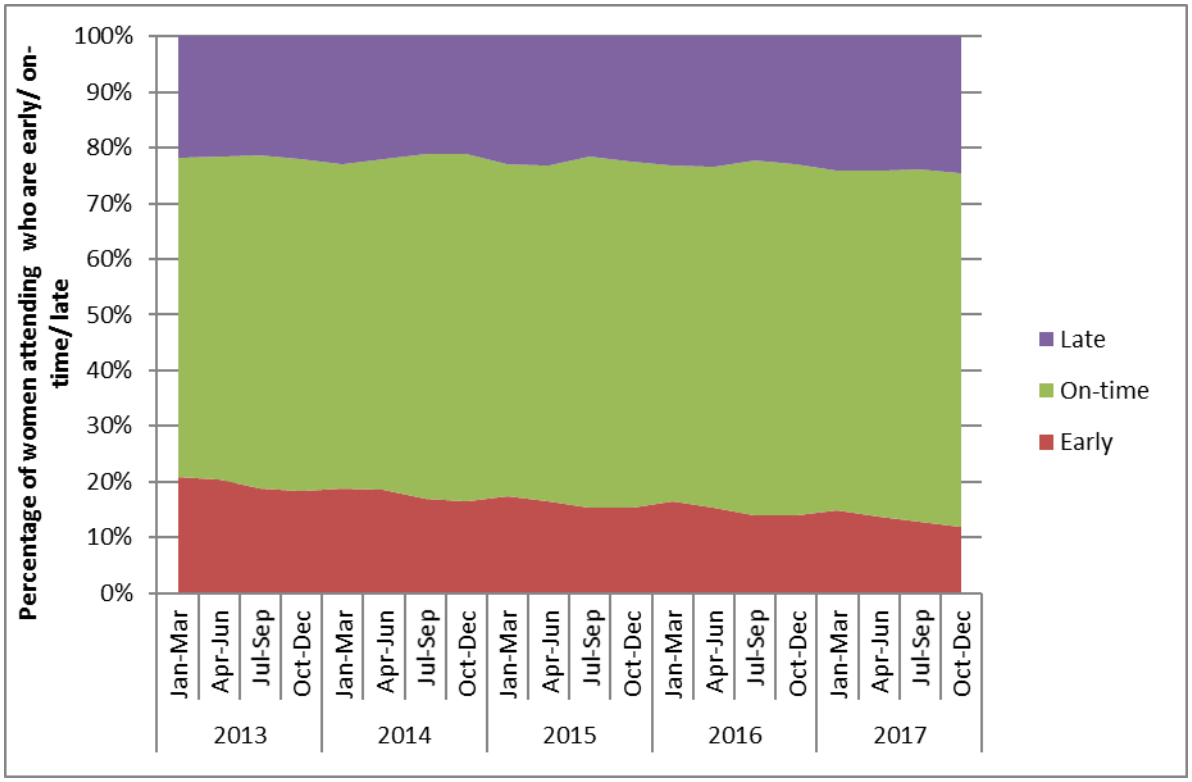


Figure 28 – Timeliness of re-attendance following a routine (3-year) repeat screening recommendation (percent), 2013-2017, by ethnicity

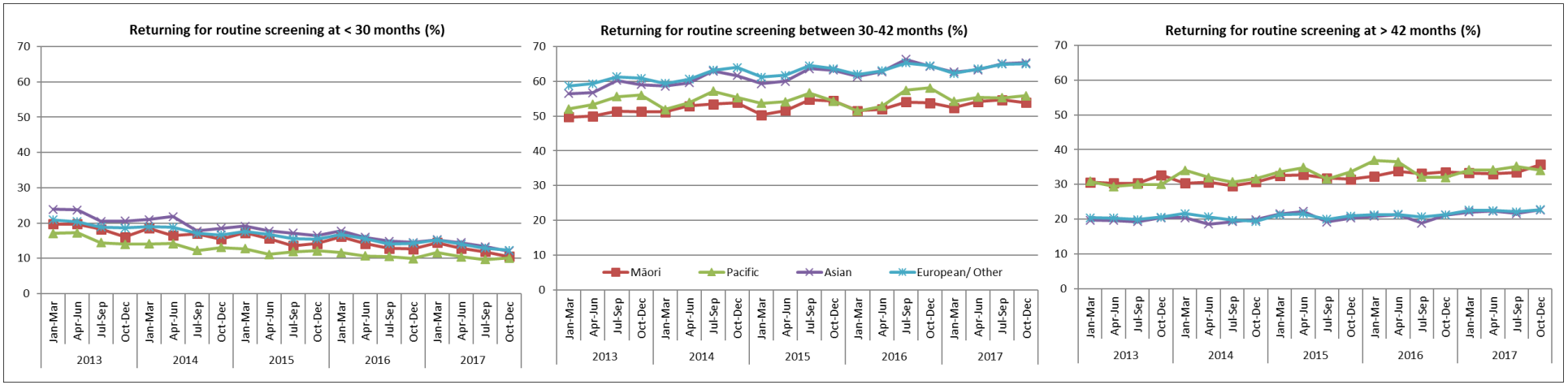


Figure 29 – Timeliness of re-attendance following a routine (3-year) repeat screening recommendation (percent), 2013-2017, by age

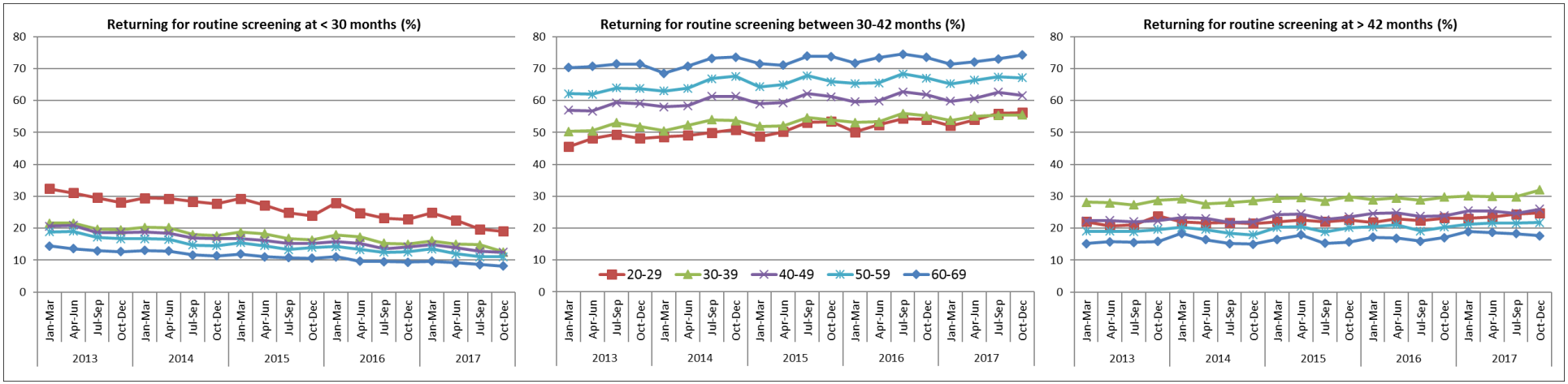


Figure 30 – Trends in the timeliness of re-attendance following a 12-month repeat screening recommendation

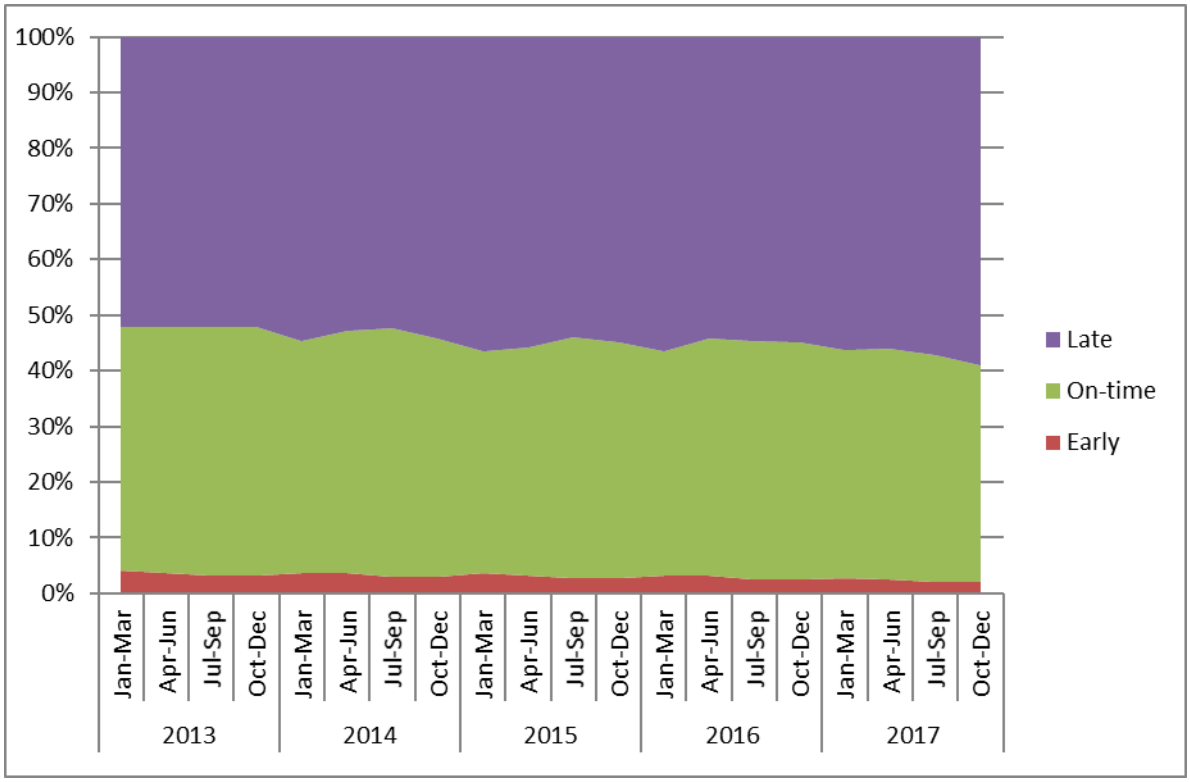


Figure 31 – Timeliness of re-attendance following a 12-month repeat screening recommendation (percent), 2013-2017, by ethnicity

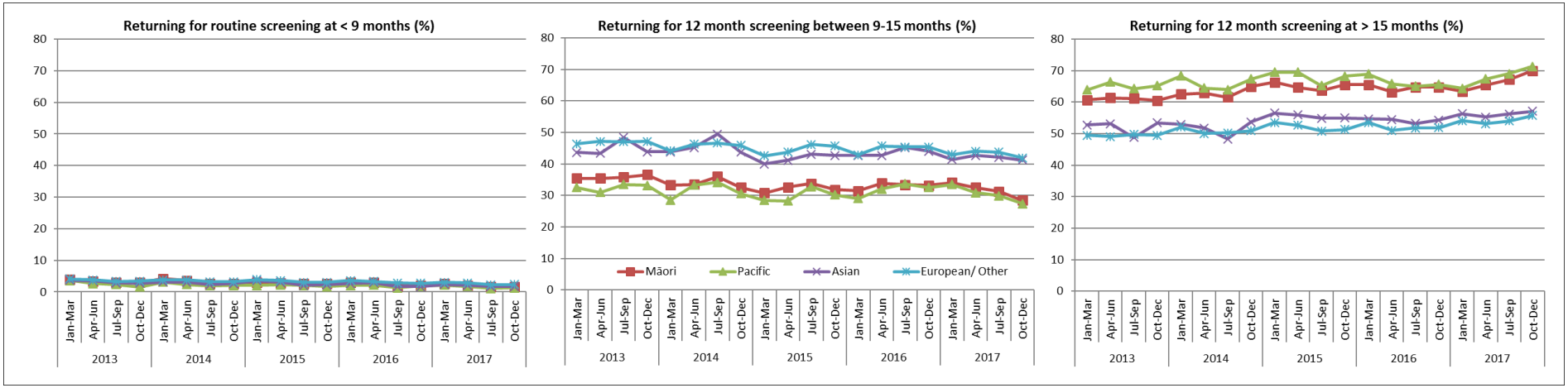
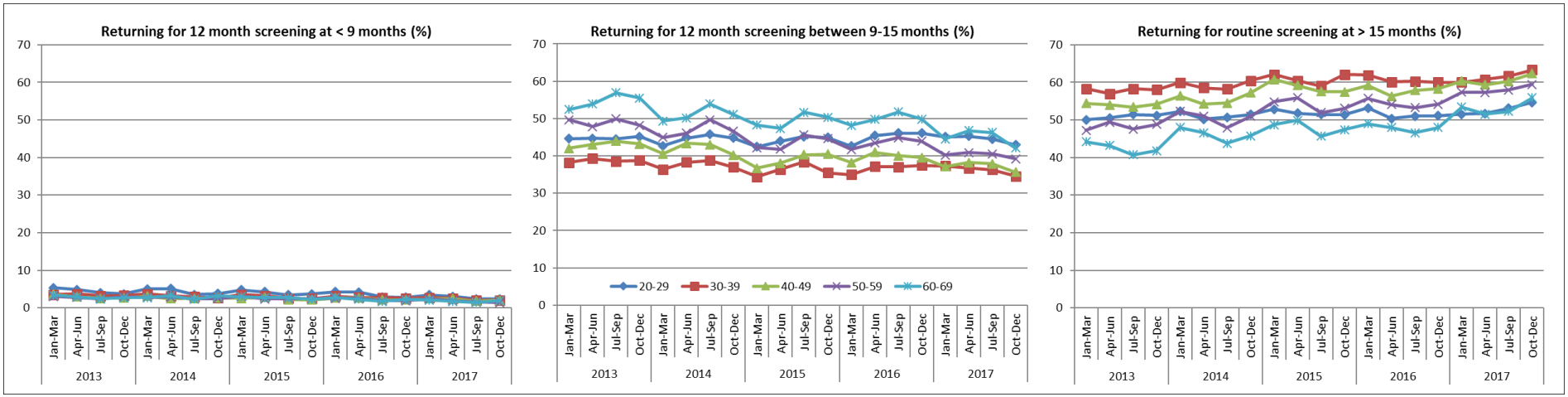


Figure 32 – Timeliness of re-attendance following a 12-month repeat screening recommendation (percent), 2013-2017, by age



Indicator 2 – First screening events

Definition

Women with no cervical (cytology, histology, or HPV) samples 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 2017).

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 22,618 women aged 20-69 years at the end of the period who had their first screening event in the period 1 July - 31 December 2017. This constituted 11.0% of the 205,382 women aged 20-69 years with a cervical sample taken in the period (screening event), and 1.6% of the eligible population. The median age (at the end of the monitoring period) of women with a first event recorded was 26 years.

The age group with the highest number of first screening events was women aged 20-24. 10,192 women aged 20-24 had their first screening event recorded on the register during this monitoring period, accounting for 45.1% of all women aged 20-69 years with first screening events (Figure 33, Table 41). First screening events then tended to decrease with increasing age. Women aged 20-24 years also had the highest proportion of women screened in their age group who were being screened for the first time (44.8%) (Figure 34), and the highest proportion of the eligible population at that age with a first screening event recorded in the current monitoring period (6.1%) (Figure 120).

The DHBs with the highest number of women aged 20-69 years with first screening events were Auckland (3,332) and Waitemata (3,087). The DHBs where women with first screening events, as a proportion of all women with screening events, were the highest in Auckland (14.4%) followed by Counties Manukau (13.5%) and Capital & Coast (13.0%). The DHBs where this proportion was lowest was West Coast (6.6%) and Taranaki (6.9%) (Figure 35, Table 42).

The ethnic group with the highest number of women with first screening events was European/Other (12,099 women; Figure 36, Table 43). The group with the highest proportion of their eligible population being screened for the first time was Asian women (2.8%), and the lowest was Māori women (1.2%) (Table 43). The proportion of women screened who were being screened for the first time was highest for Asian women (22.4%; Figure 36, Table 43). 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 21 years for Māori women, 25 years for Pacific women, and 23 years for European/ Other women; Table 44).

Trends

The number of women with a first screening event recorded on the NCSP Register has increased from 22,362 women in the previous period to 22,618 in the current period. Across the overall eligible population aged 20-69 years, the proportion of women with screening events that are their first screening event being recorded on the NCSP Register is similar in this period and the previous period (both 1.6%).

Patterns by age, DHB, and ethnicity are broadly similar to those seen in the previous report. Trends by age show a steady number of first screens in most five-year age groups when compared to the previous report. A noticeable increase in the number of first screens is seen in women aged 25-29 years. Small increases in the number of women with first screening events is seen in Asian women and this is also reflected as an increase in the proportion of Asian women screened who were being screened for the first time (21.8% in the previous report to 22.4% in the current report). Pacific women also showed a small increase in the proportion of women screened who were being screened for the first time (14.5% to 15.2% in the current report) while rates were similar for Māori and European/ Other women. As was the case in previous reports, the median age of a first screening event was older for Asian women than for Māori, Pacific and European/ Other women, and in Asian women those with a first screening event constituted a larger proportion of all women screened than in other ethnic groups.

Trends over the two years ending 31 December 2017 are shown in Figure 37 (by age), Figure 38 (by DHB), and Figure 39 (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. For example, the DHB with the highest coverage, Bay of Plenty, does not have a particularly high proportion of women with first 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 33 - Women with first screening events during the monitoring period, by five-year age group (women aged 20-69 years at 31 December 2017)

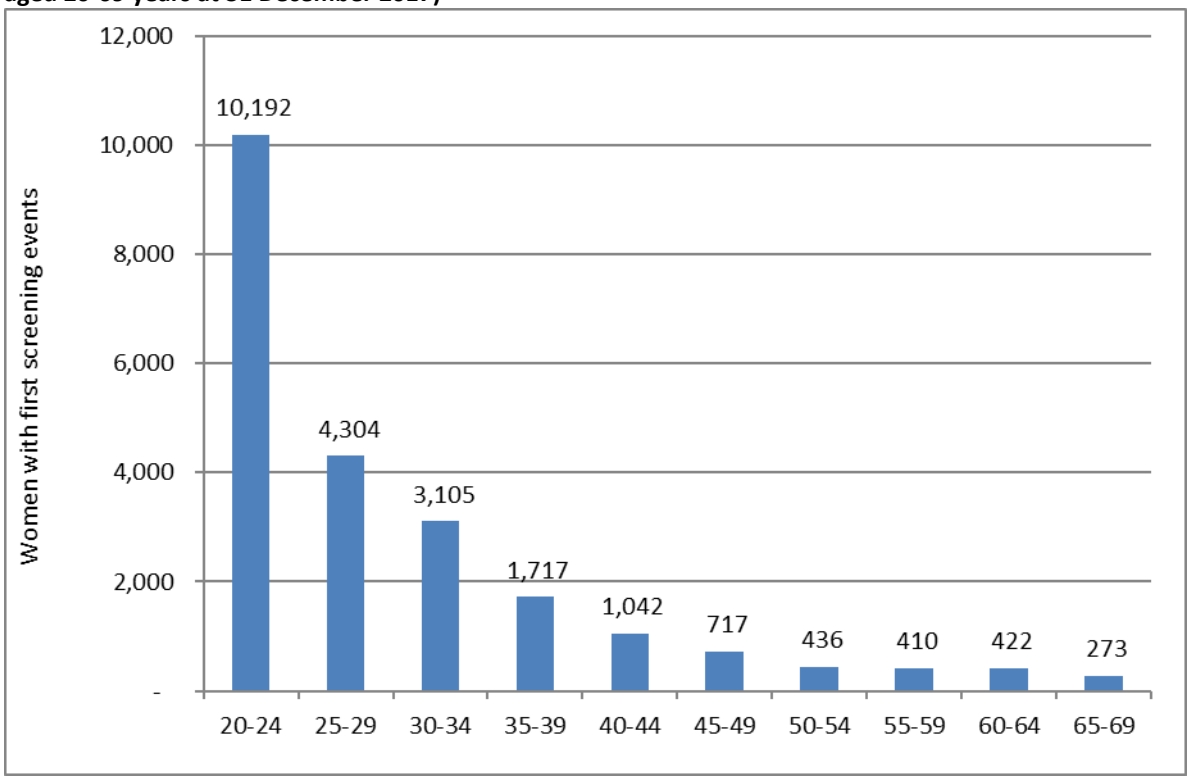


Figure 34 - Women with first screening events as a proportion of all women screened in that age group during the monitoring period, by five-year age group (women aged 20-69 years at 31 December 2017)

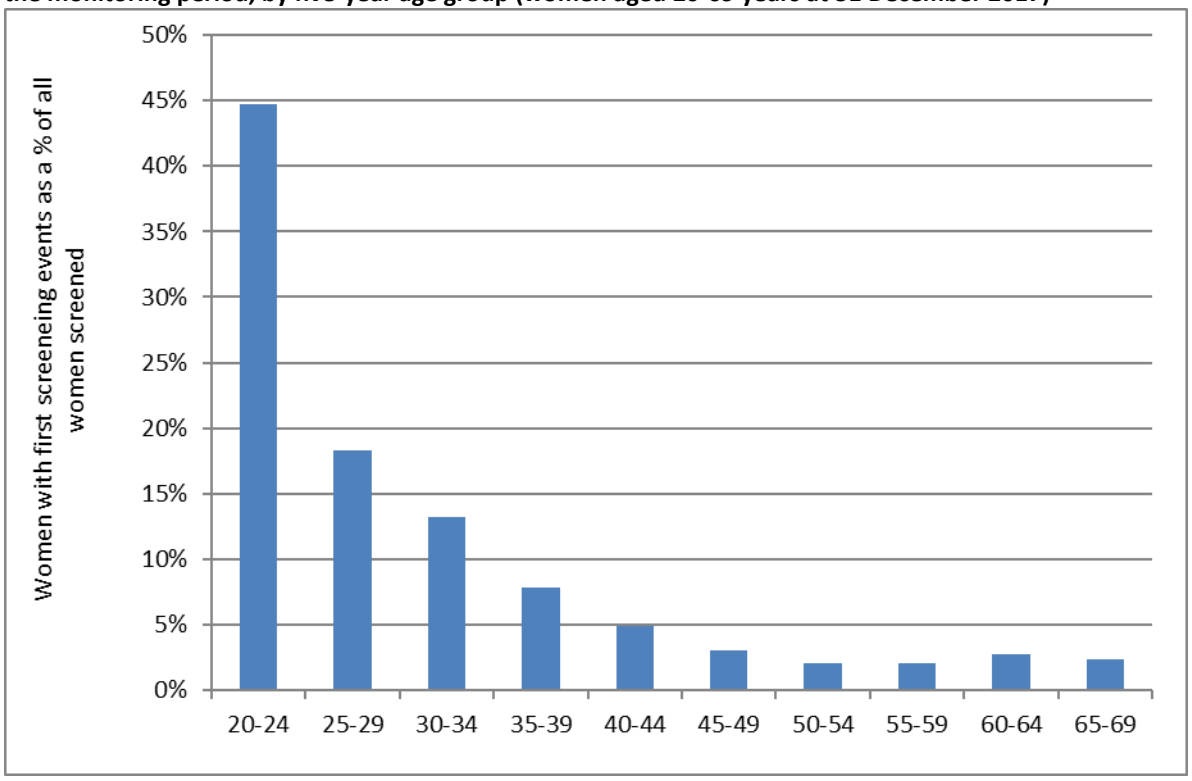


Figure 35 - Women with first screening events as a proportion of all women screened during the monitoring period, by DHB (women aged 20-69 years at 31 December 2017)

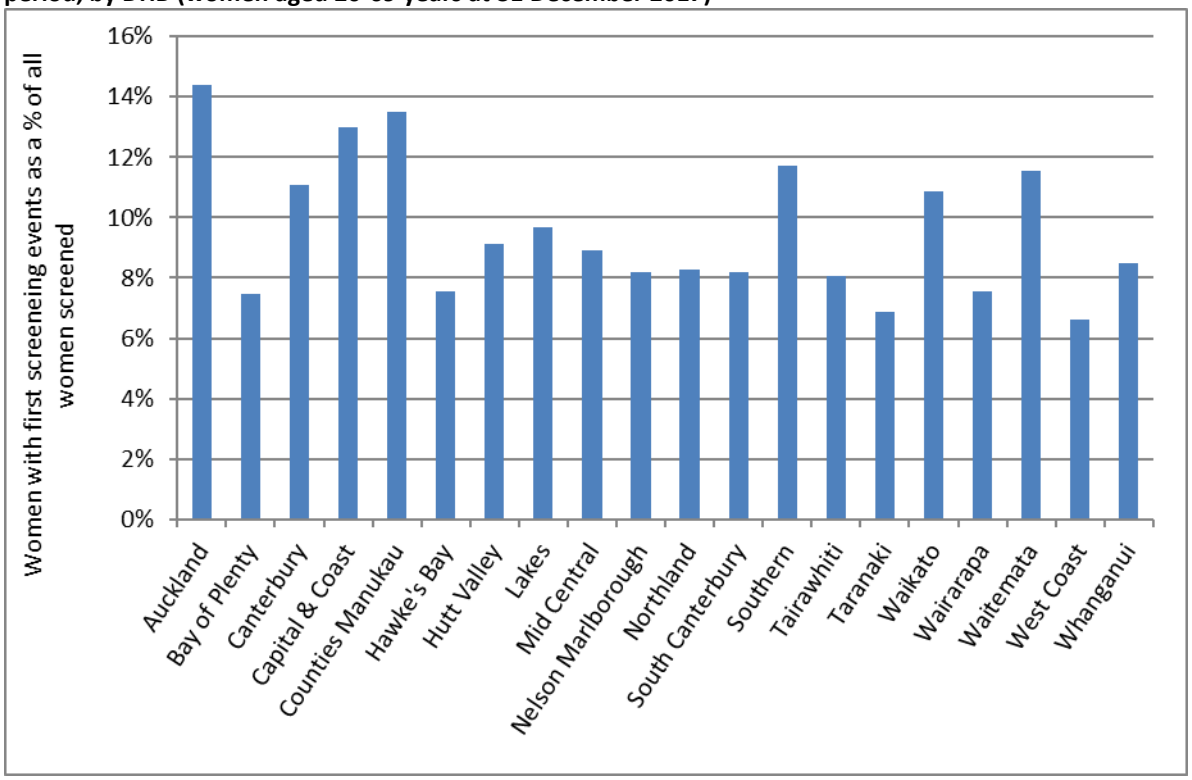


Figure 36 - Women with first screening events as a proportion of all women screened during the monitoring period, by ethnicity (women aged 20-69 years at 31 December 2017)

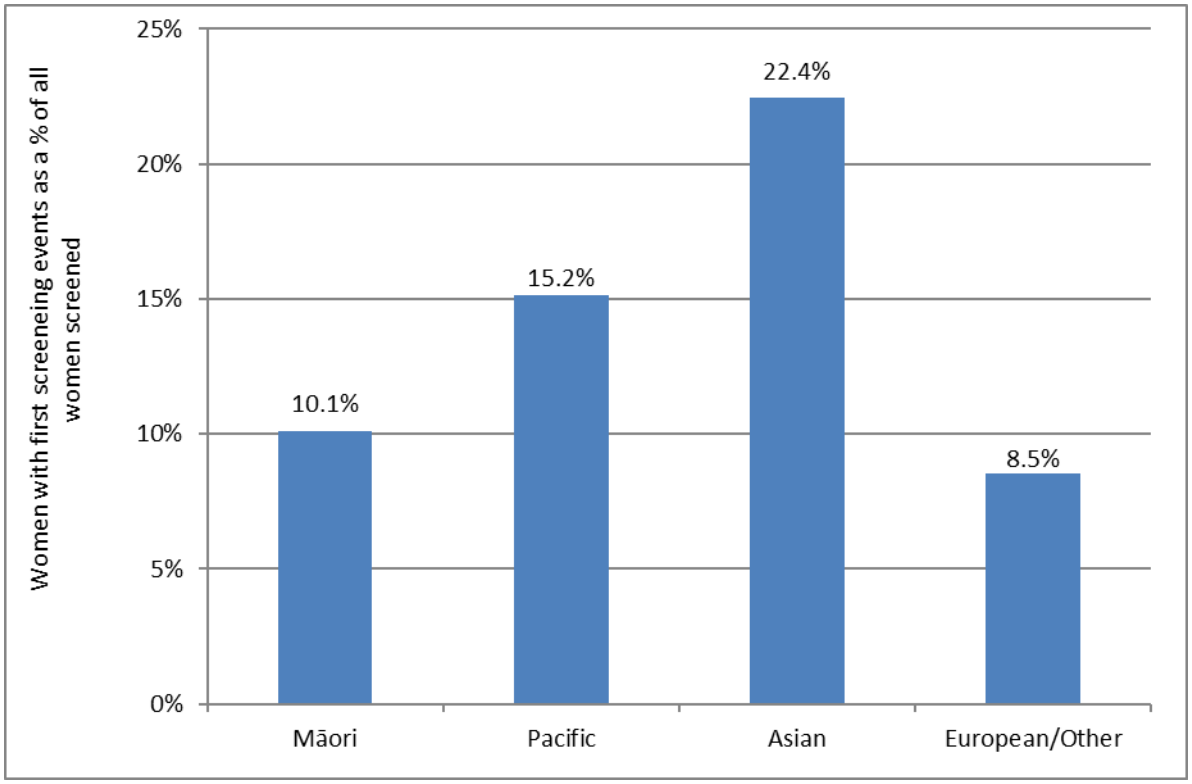


Figure 37 - Trends in the number of women with a first screening event, by age

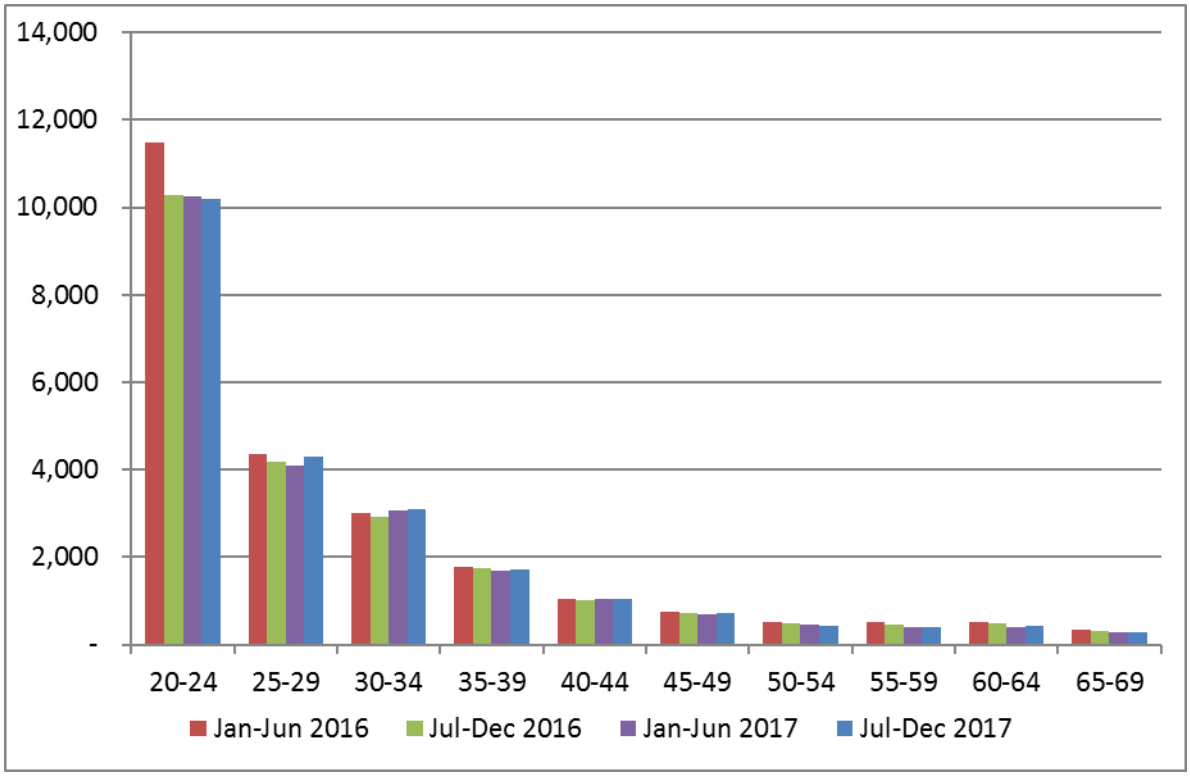


Figure 38 - Trends in the number of women with a first screening event, by DHB

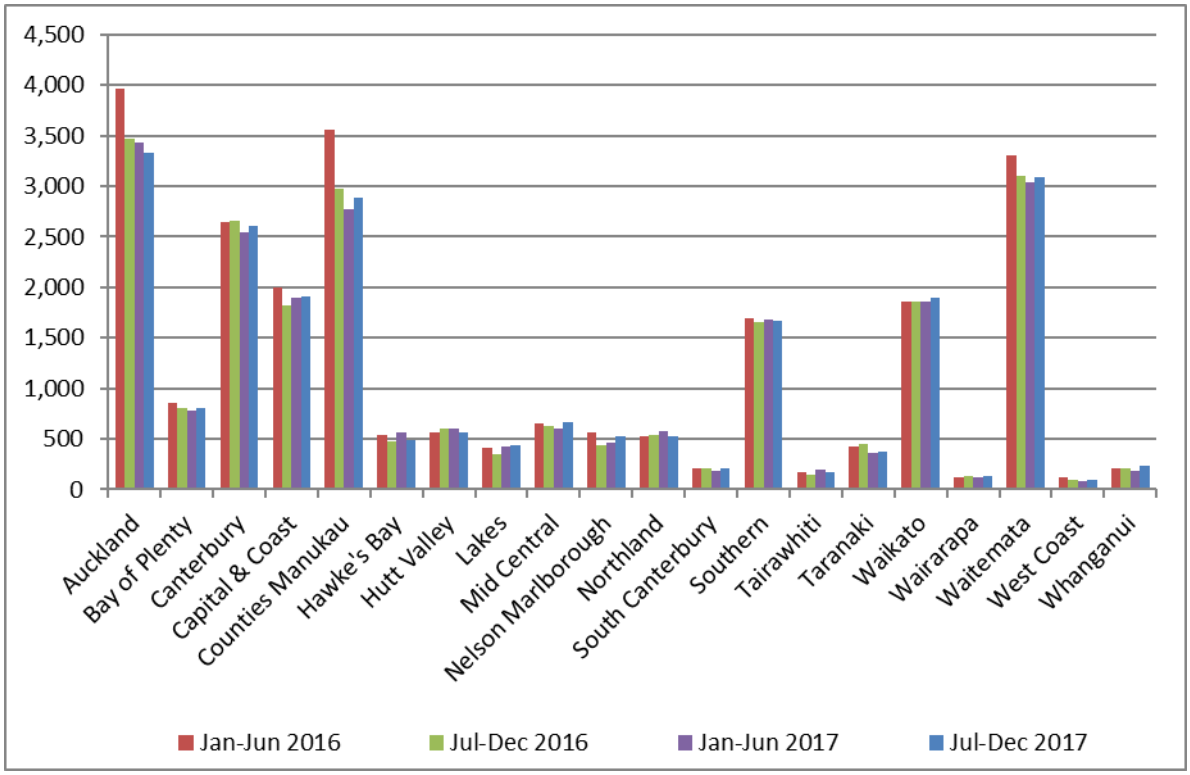
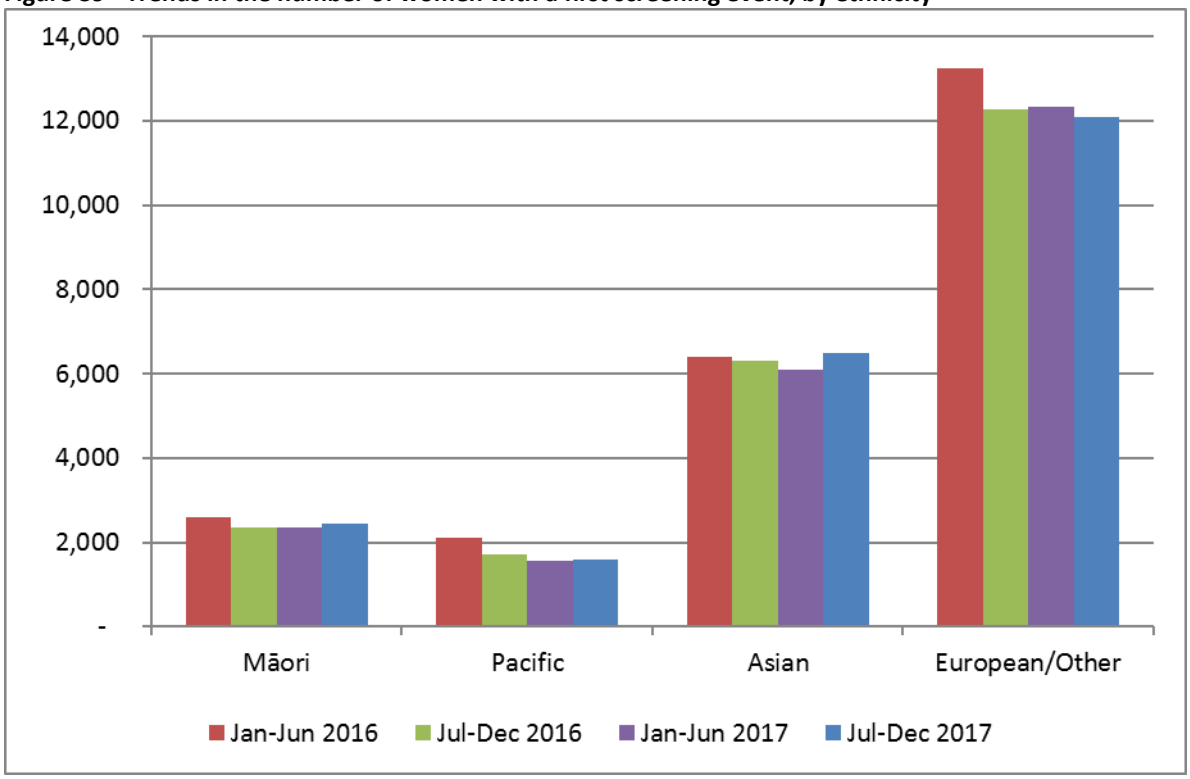


Figure 39 - Trends in the number of women with a first screening event, by ethnicity

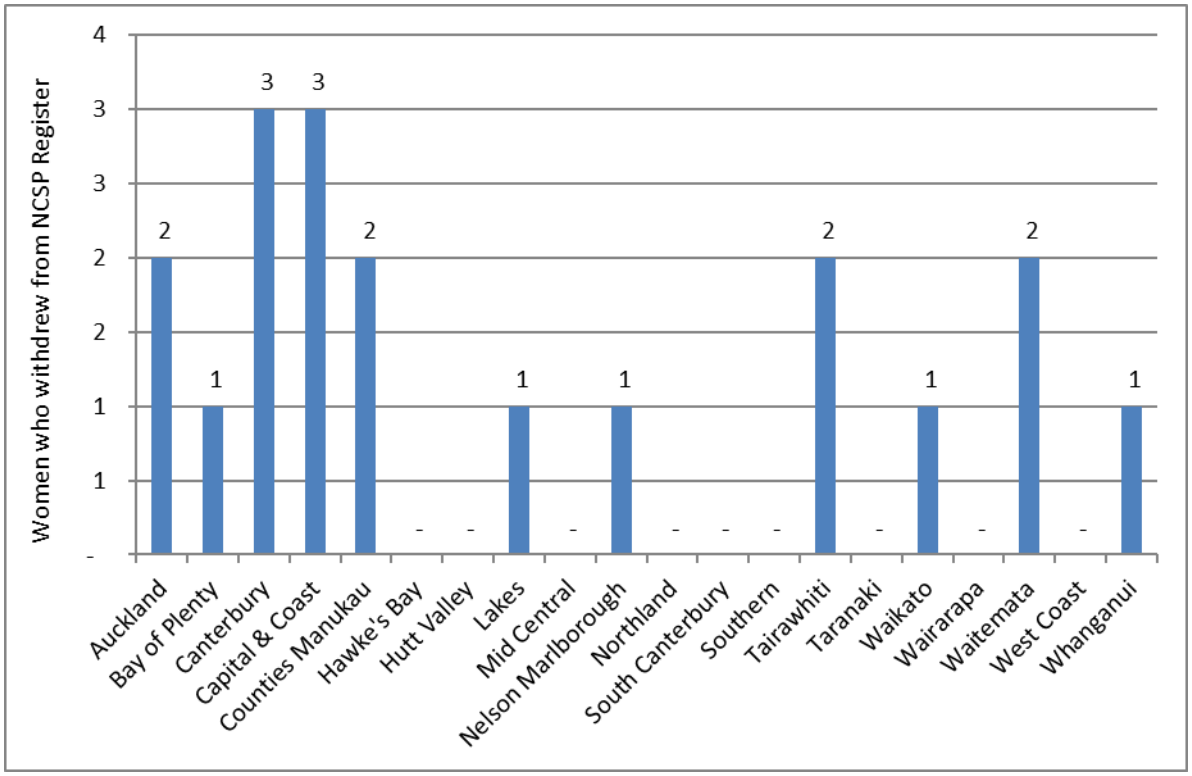


Indicator 3 – Withdrawal rates

Definition	The number of women, by age-group, DHB, and ethnicity not currently enrolled in the NCSP Register and whose enrolment ended during the monitoring period (withdrawals). Withdrawals relate to active withdrawals, where women specifically elect to be removed from the NCSP Register. Withdrawals are also reported as a proportion of women who were enrolled on the NCSP Register at 30 June 2017 (i.e. just prior to the commencement of the current monitoring period). This is also reported by age group, DHB, and ethnicity. Age is defined as a woman's age at the end of the monitoring period (i.e. at 31 December 2017).
Target	Zero for ages 20-69 years.
Current Situation	At the end of the previous monitoring period, 1,590,837 women aged 20-69 years were enrolled on the NCSP Register. During the current monitoring period, 20 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 three women in the Canterbury and Capital & Coast DHB regions). No women withdrew in nine of the twenty DHB regions (Figure 40). The number and proportion of women withdrawing was extremely small for all age groups, but were largest among women aged 20-24 years (4 women, 0.005% of those enrolled at the end of the previous monitoring period), 40-44 years (4 withdrawals, 0.002%) and 50-54 years (4 withdrawals, 0.002%) (Figure 41, Table 45). The number and proportion of women withdrawing was extremely small for all ethnic groups. Two Māori and two Pacific women withdrew in the current monitoring period (0.001% and 0.002%, respectively), while 13 European/ Other women (0.001%) and three Asian women (0.002%) withdrew during the current monitoring period Figure 42, Table 46).
Trends	The number of women who withdrew in the current monitoring period (20 women) is lower than in the previous monitoring period (30 women), decreasing for the first time since report 45 (January – June 2016). 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 40 - Number of women (aged 20-69 years) who withdrew from the NCSP Register by DHB, 31 December 2017



Excludes 1 women who withdrew whose DHB was not recorded.

Figure 41 - Number of women who withdrew from the NCSP Register by age, 31 December 2017

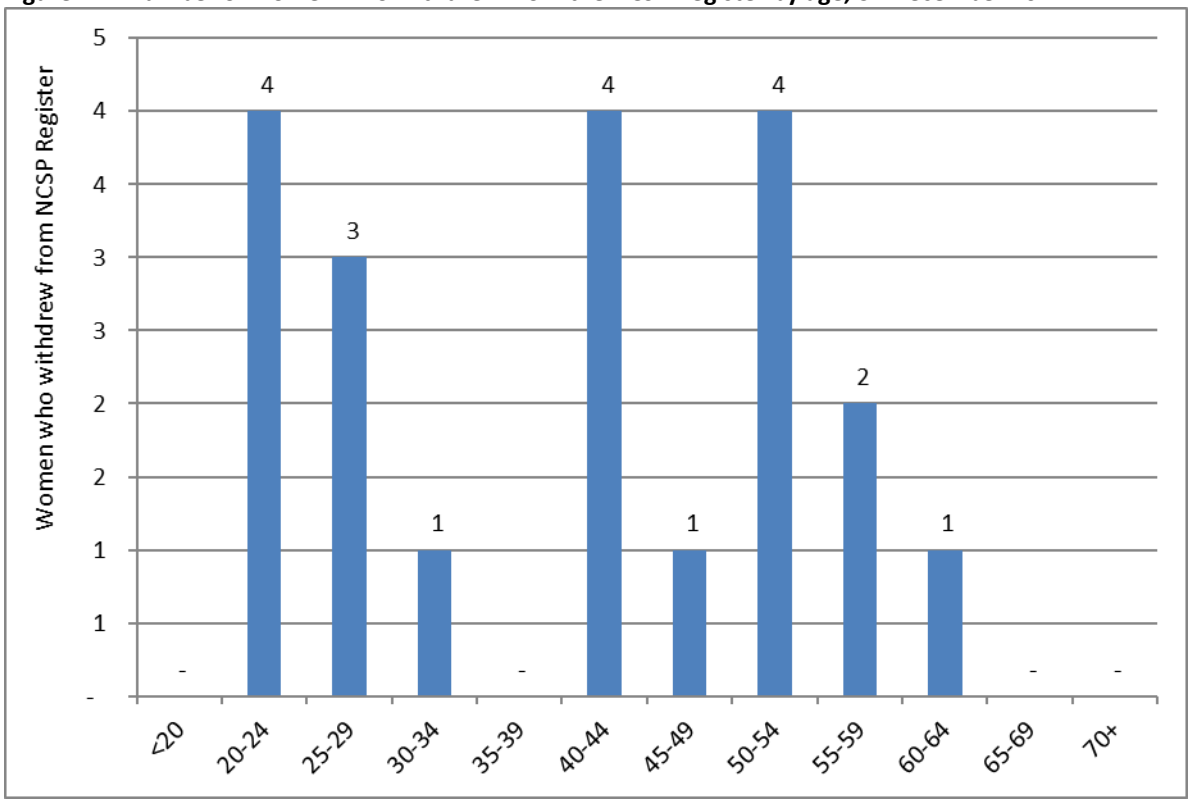
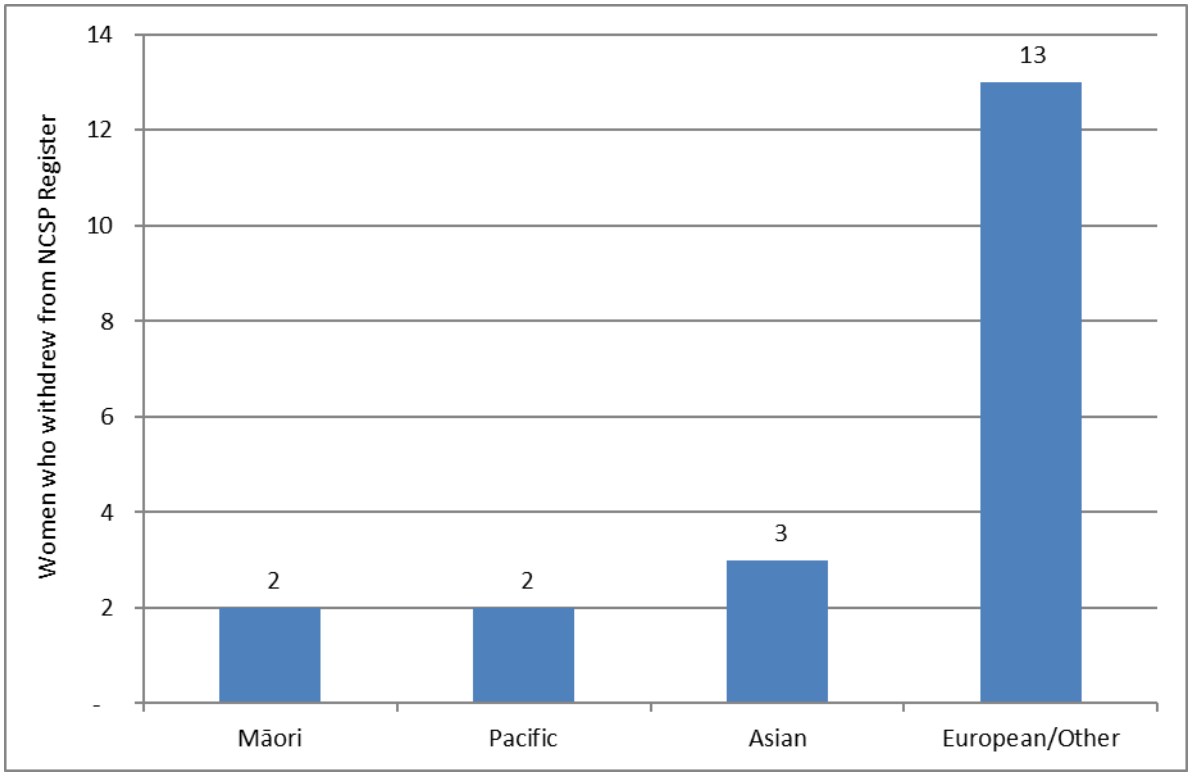


Figure 42 - Number of women (aged 20-69 years) who withdrew from the NCSP Register by ethnicity, 31 December 2017



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 2015 (inclusive), who i) were aged 20-66 years at the time the smear was taken (and hence remained within the screening target age throughout the period); and ii) were given a recommendation to return at the regular interval of three years as a result of their smear in February/ March 2015 (NZ Modified Bethesda code R1). Using this method of calculating the measure allows follow-up to be considered over 30 months for every individual woman. This measure excludes women who return early but are being followed according to *Guidelines for Cervical Screening in New Zealand*, for example, those with a recent report of an abnormality. It also excludes from the count of women screened early those whose "early" smear recommended urgent referral regardless of cytological findings, in view of the abnormal clinical history provided (NZ Modified Bethesda code R14). In some cases, early re-screening may be the result of women being re-screened early in response to clinical symptoms, and this is appropriate. For the purposes of analysis by age group, a woman's age is defined as her age at the end of the current monitoring period (i.e. a women's age at 31 December 2017).
Target	A target has not been set for this cohort-based calculation method.
Current Situation	There were 46,817 women who had a smear taken in February or March 2015, were aged between 20-66 years at the time of their smear, and were given a recommendation to return for their next smear at the routine interval of three years. Among these women, 5,895 (12.6%) 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 Wairarapa (17.4%) and Waitemata (17.1%), and was least common in Tairawhiti (6.5%) (Figure 43, Table 48). 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 (15.3%) and older women (aged 65-69 years) were the least likely to be re-screened early (7.9%) (Figure 44, Table 47). Rates of early re-screening are quite similar across six five-year age groups from 35 to 54 years (between 12.6% and 13.2%). Among the ethnic groups considered, European/ Other women were the most likely to be re-screened early (13.1%), while early re-screening was least common among Pacific women (9.8%) (Figure 45, Table 49).

Trends

The level of early re-screening (12.6%) is slightly lower to what was reported in the previous monitoring period (13.7%) and has been declining over a number of reporting periods.

The DHB with the highest level of early rescreening in this report was Wairarapa (17.4%) followed by Waitemata (17.1%). In most DHBs, early rescreening is decreasing; however early rescreening increased in the current report in two DHBs (Wairarapa, from 13.4% to 17.4%; Whanganui from 7.6% to 10.1%) and remained similar in one DHB (Hutt Valley). Trends over the two years ending 31 December 2017 by DHB are shown in Figure 46.

A reduction in the level of early re-screening was seen for eight of the ten five-year age groups between 20 and 69 years since the previous report. A small increase was seen in one age group however: in women aged 55-59 years (from 11.8% to 12.1%) and women 60-64 remained at a similar percent between the two monitoring periods (10.1%). Trends over the two years ending 31 December 2017 by five-year age group are shown in Figure 47.

Small decreases in early re-screening were also seen in most ethnic groups with the greatest drops seen in Asian (from 13.6% to 12.0%) and Māori women (from 12.3% to 10.9%) since the last monitoring period. Early rescreening in European/ Other women decreased to a lesser extent (from 14.1% to 13.1%). Rates remained similar in Pacific women, but this was already the group with the lowest levels of early re-screening (9.8% for both reports).

Comments

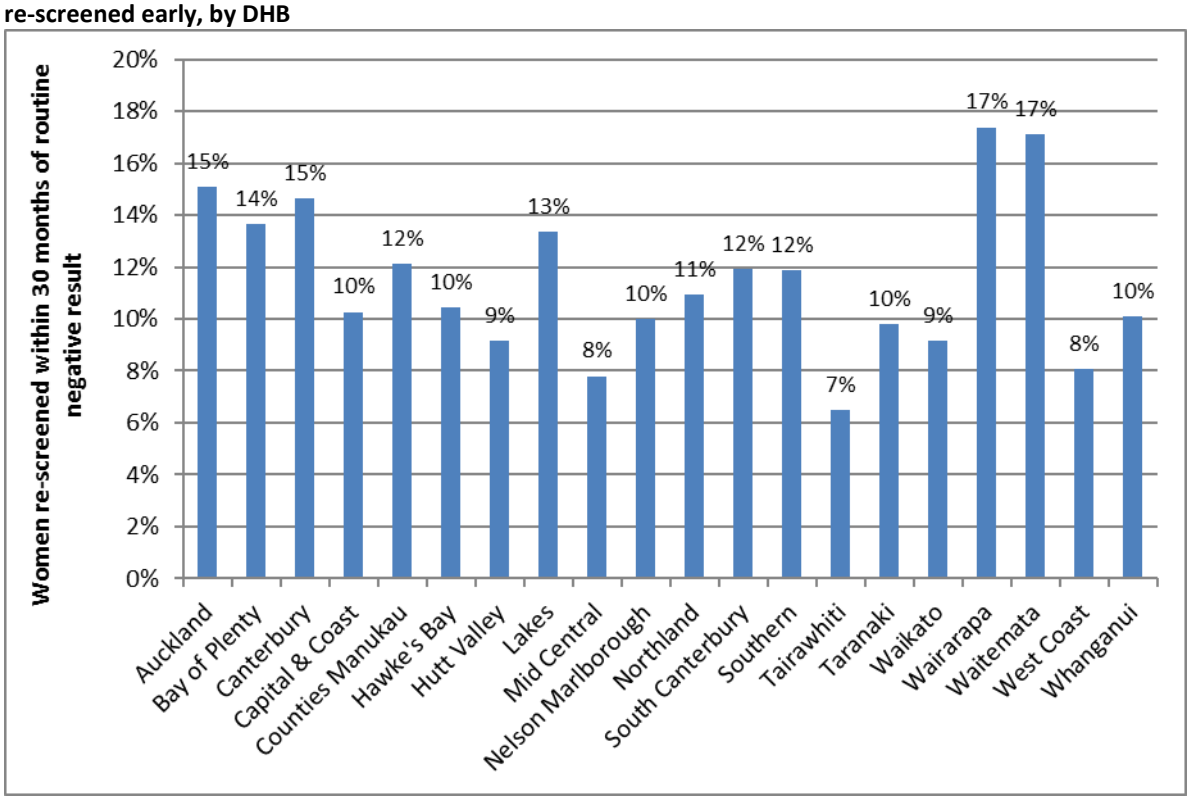
Early re-screening was assessed based on cytology recommendation codes, in order to exclude from the early re-screening group women with a negative smear for whom an earlier screening visit is appropriate. Thus, only women with a recommendation that their next screening visit be in three years were eligible 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 –

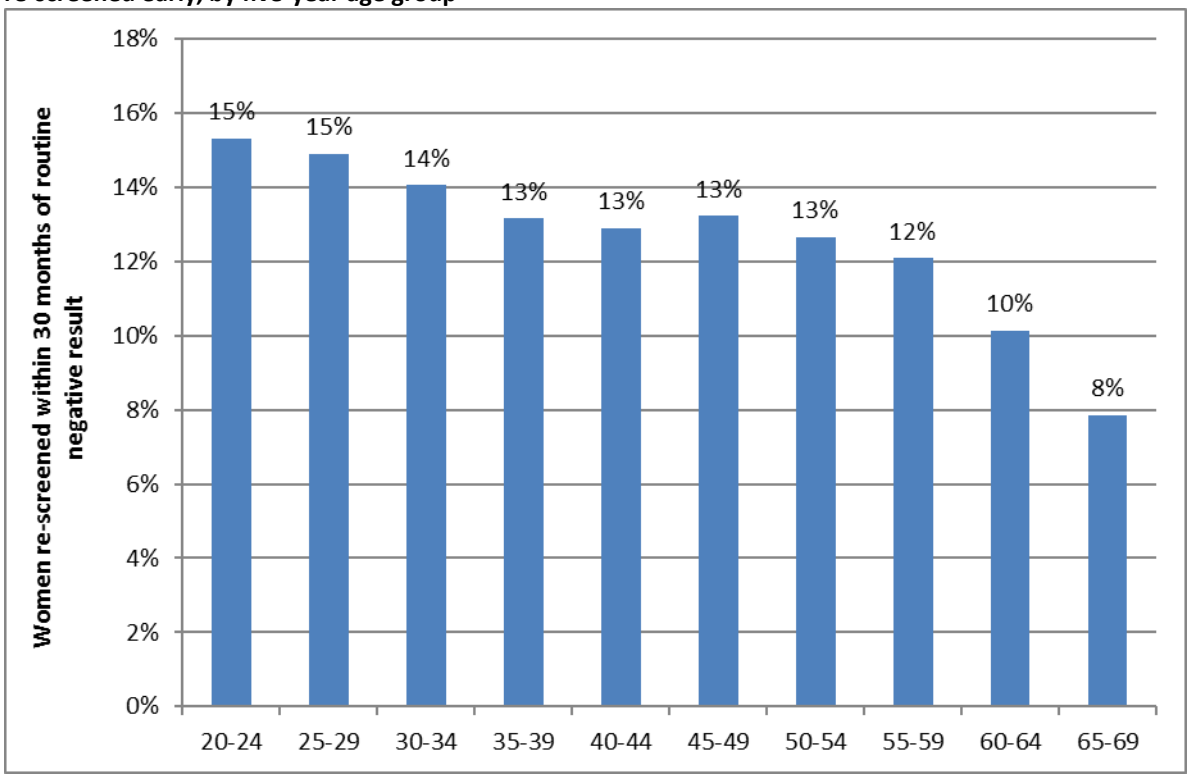
"*What proportion of women who are re-attending for routine screening in a particular time period are returning at least six months early?*", and does not take into account women who did not attend for screening; whereas Indicator 4 addresses the question – "*What proportion of women recommended to return 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 43 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB



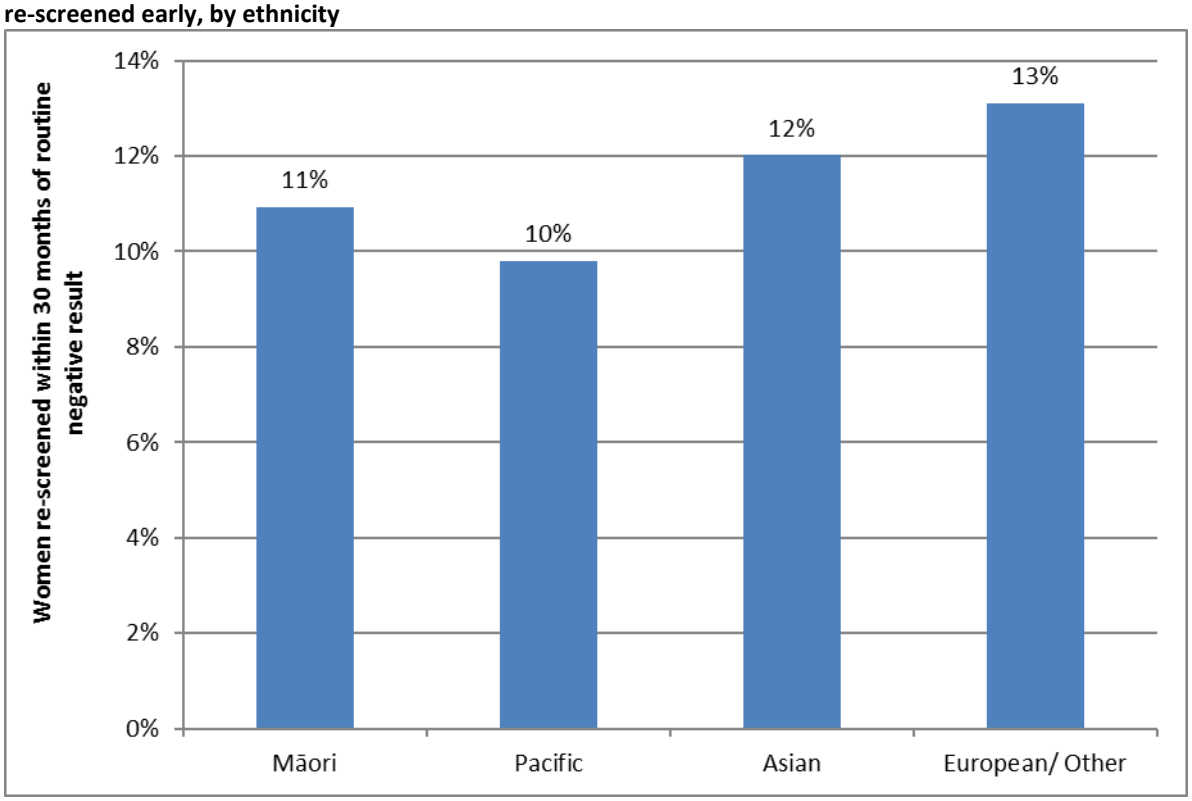
See also Table 48.

Figure 44 - 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 47.

Figure 45 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity



See also Table 49.

Figure 46 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB

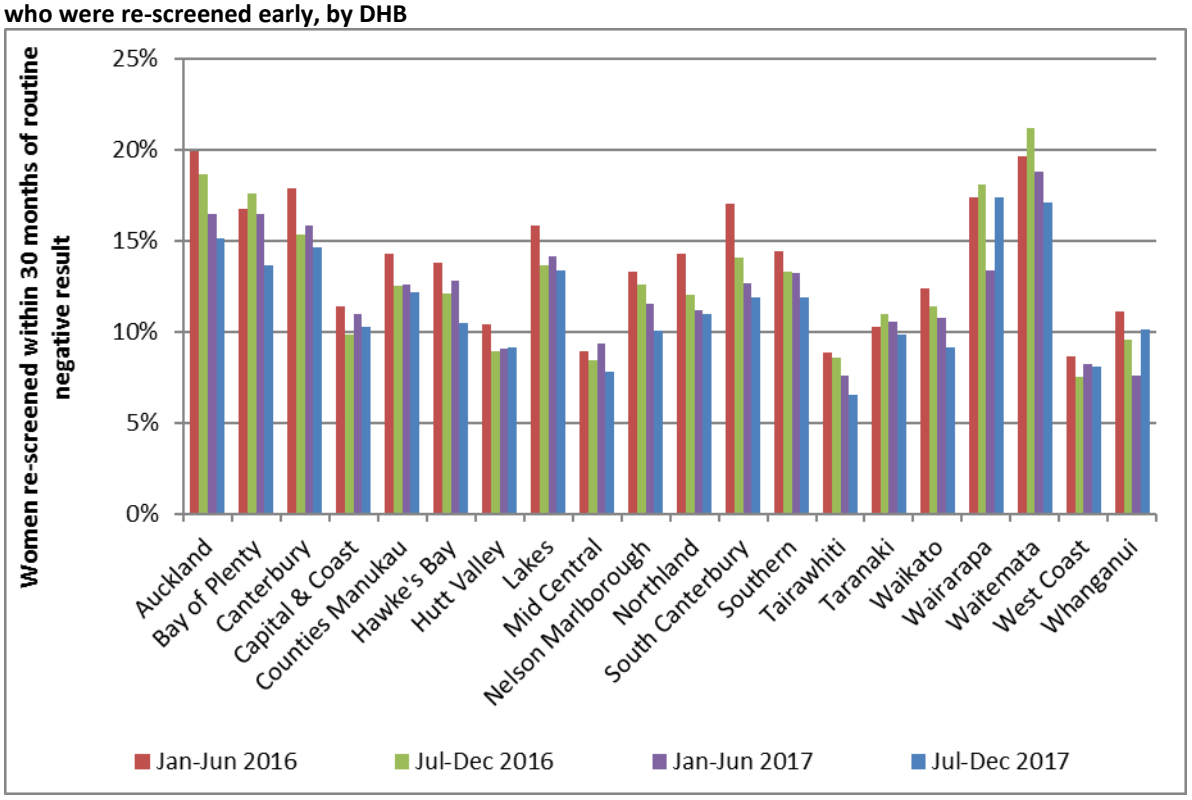


Figure 47 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by age

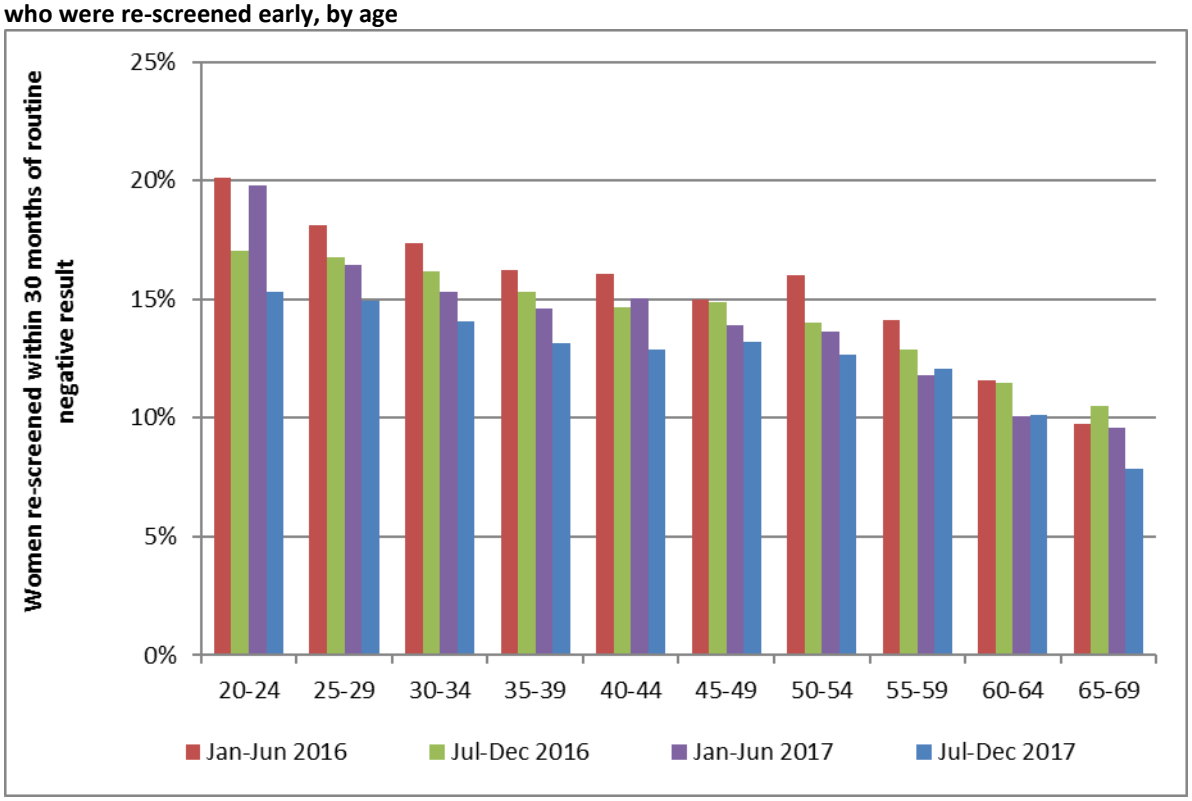
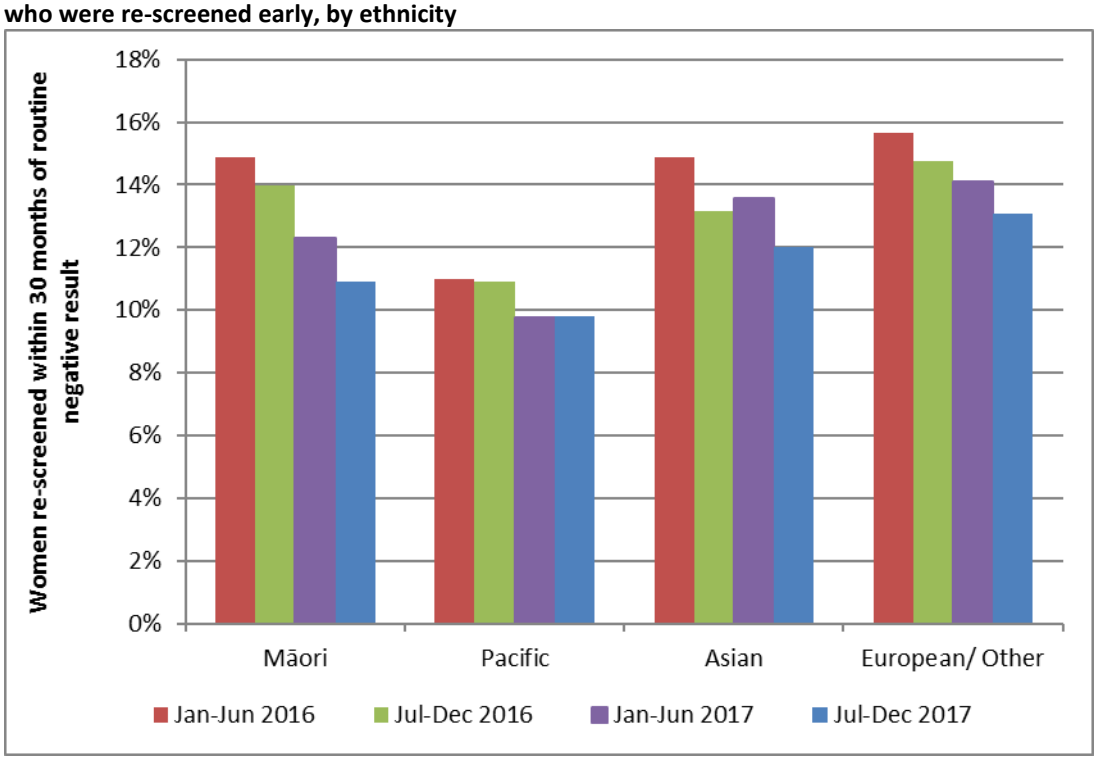


Figure 48 - Trends in the proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity



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 (future development), 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 206,871 cytology samples were taken, almost all of which (>99.99) were coded as liquid-based cytology (LBC) samples. The other 0.01% of cytology tests were miscoded). ***Unsatisfactory cytology*** 2,965 cytology samples (1.4%) were unsatisfactory. The unsatisfactory rate for LBC is 1.4%, 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% (Anatomical Pathology Services; 4.2%). Pathlab had the lowest unsatisfactory percentage of 0.4% (Figure 49, Table 1).

Unsatisfactory samples are reported in more detail in Table 1 and Figure 49. The remaining satisfactory samples are reported on below and in more detail in Table 1 to Table 6.

Negative cytology reports

93.5% of satisfactory cytology results were negative (Table 1), consistent with the target of no more than 96%. The proportion of samples which were negative varied by laboratory from 80.2% (LabPLUS) to 95.8% (Southern Community Laboratories) (Figure 50). All six laboratories met the target of no more than 96%.

Abnormal cytology reports

Nationally, the proportion of satisfactory samples which were abnormal (6.5%) was consistent with the target of no more than 10% (Figure 51, Table 2). This varied by laboratory, from 4.2% (Southern Community Laboratories) to 19.8% (LabPLUS) (Figure 51). Two laboratories (LabPLUS and Canterbury Health Laboratories) exceeded the target (19.8% and 10.5%, 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, 0.7% 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% (Anatomical Pathology Services) to 2.1% (LabPLUS). Five of the six laboratories met the HSIL target (Table 4, Figure 52).

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 50).

Trends

Unsatisfactory cytology

Overall, the percentage of unsatisfactory LBC samples for the current monitoring period is similar to that seen in the previous monitoring period (1.4% in both reports). One laboratory that exceeded the maximum target for unsatisfactory LBC samples in the previous two reports had a rate within the target range in this report.

Negative vs abnormal cytology reports

The proportion of satisfactory cytology samples which are negative for intraepithelial lesion or malignancy (93.5%) is similar to the previous monitoring period (93.3%), and correspondingly the proportion of cytology samples reported as abnormal (6.5%) is also similar as in the previous monitoring period (6.7%). All six laboratories continued to meet the target for negative cytology. The same laboratories as previous reports had abnormal cytology rates above the target of 10% (Canterbury Health Laboratories and LabPLUS).

HSIL cytology reports

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

Longer term trends in the proportion of satisfactory cytology samples reported as HSIL are shown in Figure 53, Figure 54 (trends by age) and Figure 55 (trends by laboratory). Figure 53 and Figure 55 show trends over the last four monitoring report periods (two years), consistent with other trends presented in this report. Figure 54 shows longer term trends (1 July 2008 to 31 December 2017) 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 27 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 consistent decline in HSIL rates observed over the last four monitoring reports, including the current monitoring report, in women aged 20-24 years (to 1.2%), and aged 25-29 years (to 1.5%) (i.e. age eligible for HPV vaccination) and in both cases rates are now below what they were prior to the increase in the latter half of 2015. For women aged 20-24 years HSIL reporting rates are the lowest that has been since the latter half of 2008 (around the time that the HPV vaccination programme began). While there have also been decreases observed in other age groups since the increase in the latter half of 2015, the reduction in the current report brings rates in those other age groups back to levels similar to those seen prior to the increase observed in late 2015, rather than below rates seen prior to the increase.

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.

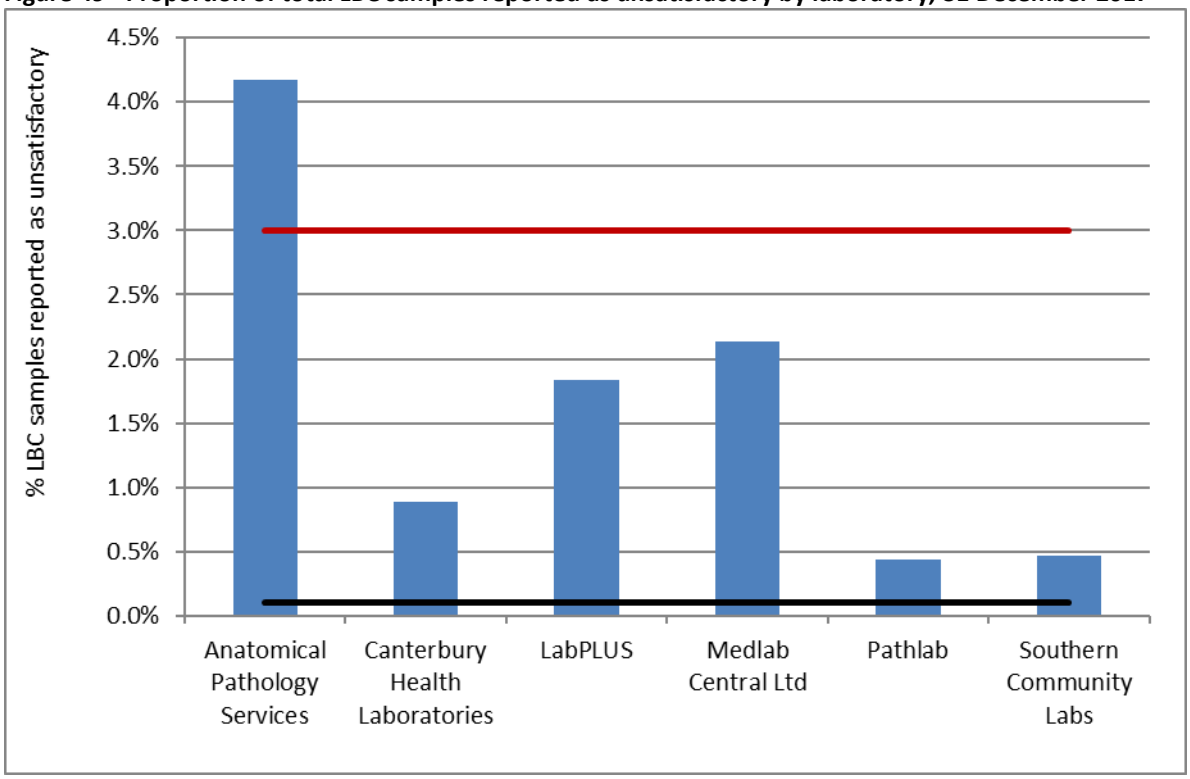
The national Human Papillomavirus (HPV) Immunisation Programme was introduced in New Zealand in September 2008, and involves routine vaccination of girls 12-13 years and catch-up vaccination has previously been offered to young women born in 1990 or later. International and New Zealand data indicate 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),[5-8] and that this is particularly true for younger women.[5, 9-11] 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 27 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 21 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 is in the current report the lowest it has been since the latter half of 2008 (around the time that the HPV vaccination programme began), and is consistent with an HPV vaccine effect. At the current time, it is not possible to present HSIL rates separately for vaccinated and unvaccinated women, because information relating to whether or not individual women have been vaccinated is not available on the NCSP Register. This data therefore needs to be interpreted with some care, as they include results in all women, both vaccinated and unvaccinated.

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

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

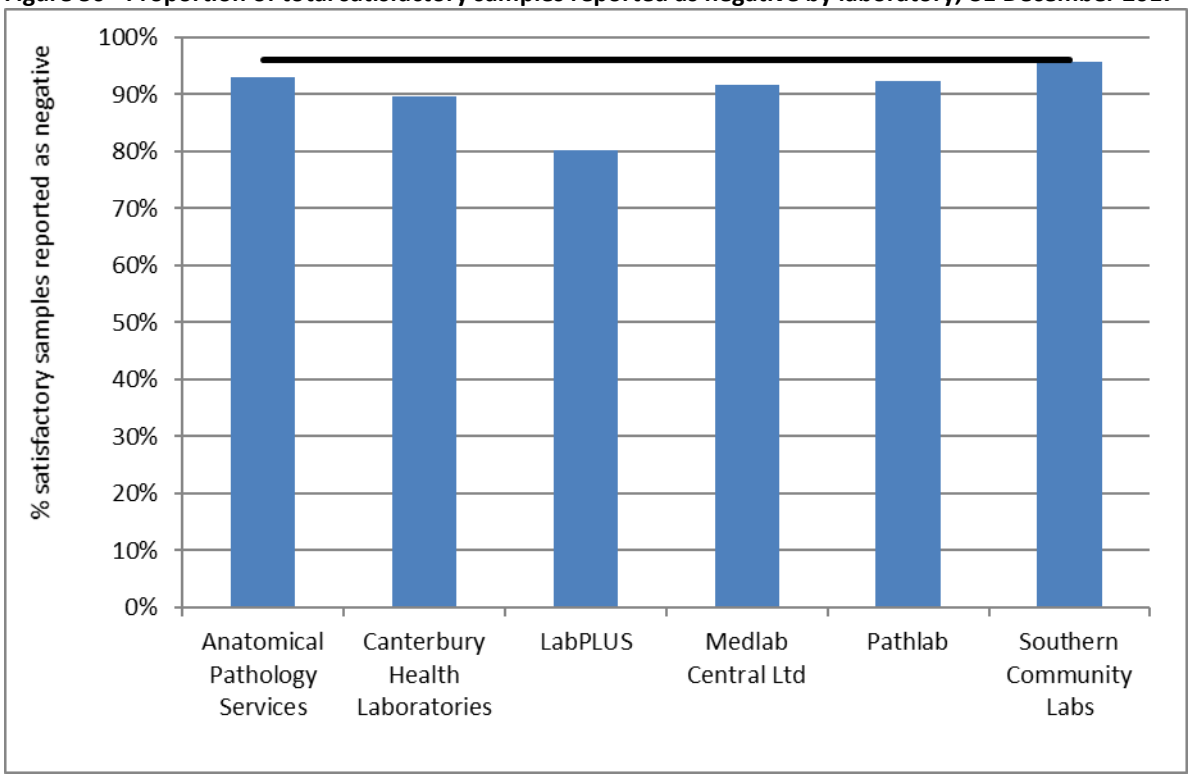
Caution must be taken when comparing percentages of reporting from this monitoring period to the previous monitoring periods due to changes in the number of reporting laboratories. Differences in percentages from this and previous monitoring reports may be due to differences in laboratory caseloads between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

Figure 49 - Proportion of total LBC samples reported as unsatisfactory by laboratory, 31 December 2017



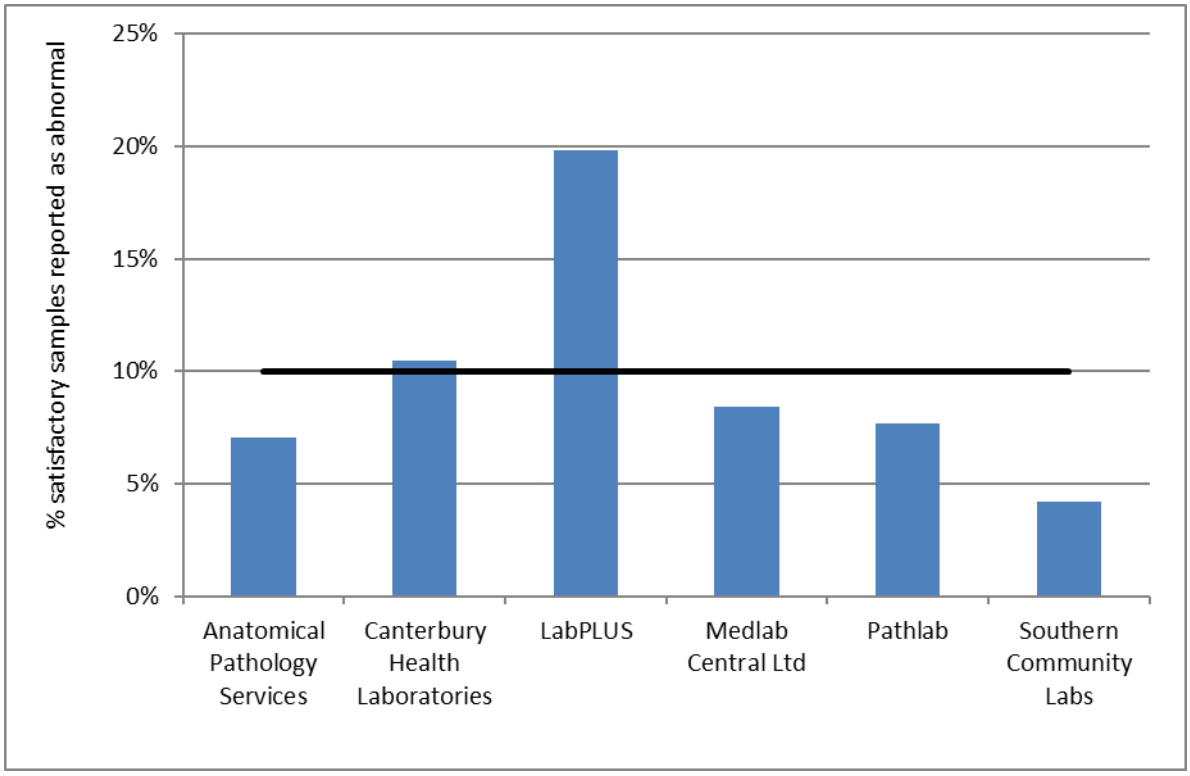
Target for LBC: 0.1-3.0% (Red line-upper target limit; black line=lower target limit)

Figure 50 - Proportion of total satisfactory samples reported as negative by laboratory, 31 December 2017



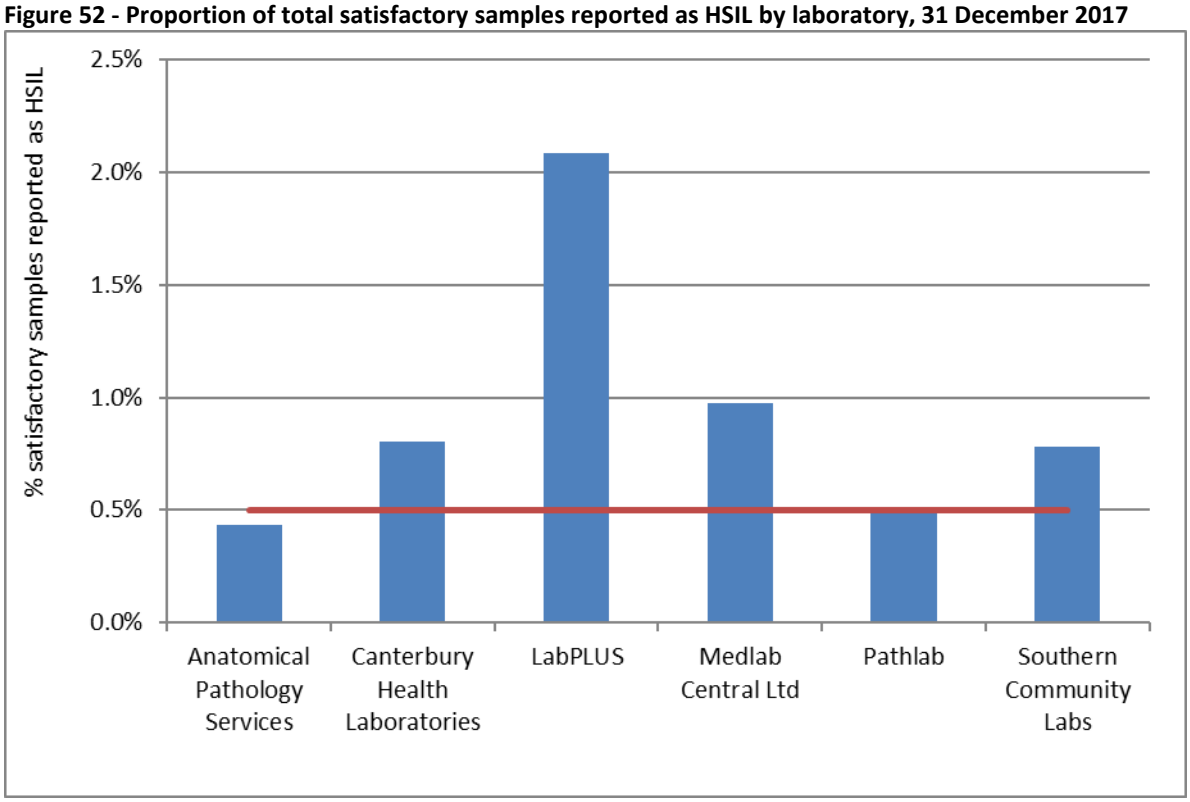
Note: Line shows negative target of no more than 96%

Figure 51 - Proportion of total satisfactory samples reported as abnormalities by laboratory, 31 December 2017



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

Figure 52 - Proportion of total satisfactory samples reported as HSIL by laboratory, 31 December 2017



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

Table 1 - Satisfactory and unsatisfactory cytology reporting by laboratory (31 December 2017)

	All samples	Satisfactory		Unsatisfactory	
Laboratory	**N**	**N**	**%**	**N**	**%**
Anatomical Pathology Services	42,650	40,871	95.8	1,779	4.2
Canterbury Health Laboratories	9,827	9,740	99.1	87	0.9
LabPLUS	9,578	9,402	98.2	176	1.8
Medlab Central Ltd.	15,109	14,786	97.9	323	2.1
Pathlab	26,168	26,055	99.6	113	0.4
Southern Community Laboratories	103,539	103,052	99.5	487	0.5
Total	**206,871**	**203,906**	**98.6**	**2,965**	**1.4**

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

Table 2 - Laboratory cytology reporting by general result (31 December 2017) – percentage of satisfactory samples

	Negative		Abnormal	
Laboratory	**N**	**%**	**N**	**%**
Anatomical Pathology Services	37,991	93.0	2,880	7.0
Canterbury Health Laboratories	8,722	89.5	1,018	10.5
LabPLUS	7,541	80.2	1,861	19.8
Medlab Central Ltd.	13,537	91.6	1,249	8.4
Pathlab	24,055	92.3	2,000	7.7
Southern Community Laboratories	98,740	95.8	4,312	4.2
Total	**190,586**	**93.5**	**13,320**	**6.5**

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

Table 3 - Laboratory cytology reporting by type of cytological category (31 December 2017) – counts of all satisfactory samples

	Result									
Laboratory	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
Anatomical Pathology Services	37,991	823	1,646	185	177	3	42	4	-	40,871
Canterbury Health Laboratories	8,722	358	441	132	78	-	8	1	-	9,740
LabPLUS	7,541	599	780	256	196	2	22	5	1	9,402
Medlab Central Ltd.	13,537	462	506	121	144	2	12	2	-	14,786
Pathlab	24,055	667	1,026	146	128	7	23	3	-	26,055
Southern Community Laboratories	98,740	609	2,578	216	806	4	81	17	1	103,052
Total	**190,586**	**3,518**	**6,977**	**1,056**	**1,529**	**18**	**188**	**32**	**2**	**203,906**

Table 4 - Laboratory cytology reporting by cytological category (31 December 2017) – percentage of all satisfactory samples

	Result								
Laboratory	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**
Anatomical Pathology Services	93.0	2.0	4.0	0.5	0.4	0.01	0.10	0.01	-
Canterbury Health Laboratories	89.5	3.7	4.5	1.4	0.8	-	0.08	0.01	-
LabPLUS	80.2	6.4	8.3	2.7	2.1	0.02	0.23	0.05	0.01
Medlab Central Ltd.	91.6	3.1	3.4	0.8	1.0	0.01	0.08	0.01	-
Pathlab	92.3	2.6	3.9	0.6	0.5	0.03	0.09	0.01	-
Southern Community Laboratories	95.8	0.6	2.5	0.2	0.8	<0.005	0.08	0.02	<0.005
Total	**93.5**	**1.7**	**3.4**	**0.5**	**0.7**	**0.01**	**0.09**	**0.02**	**<0.005**

Target: HSIL ≥ 0.5% reported as HSIL

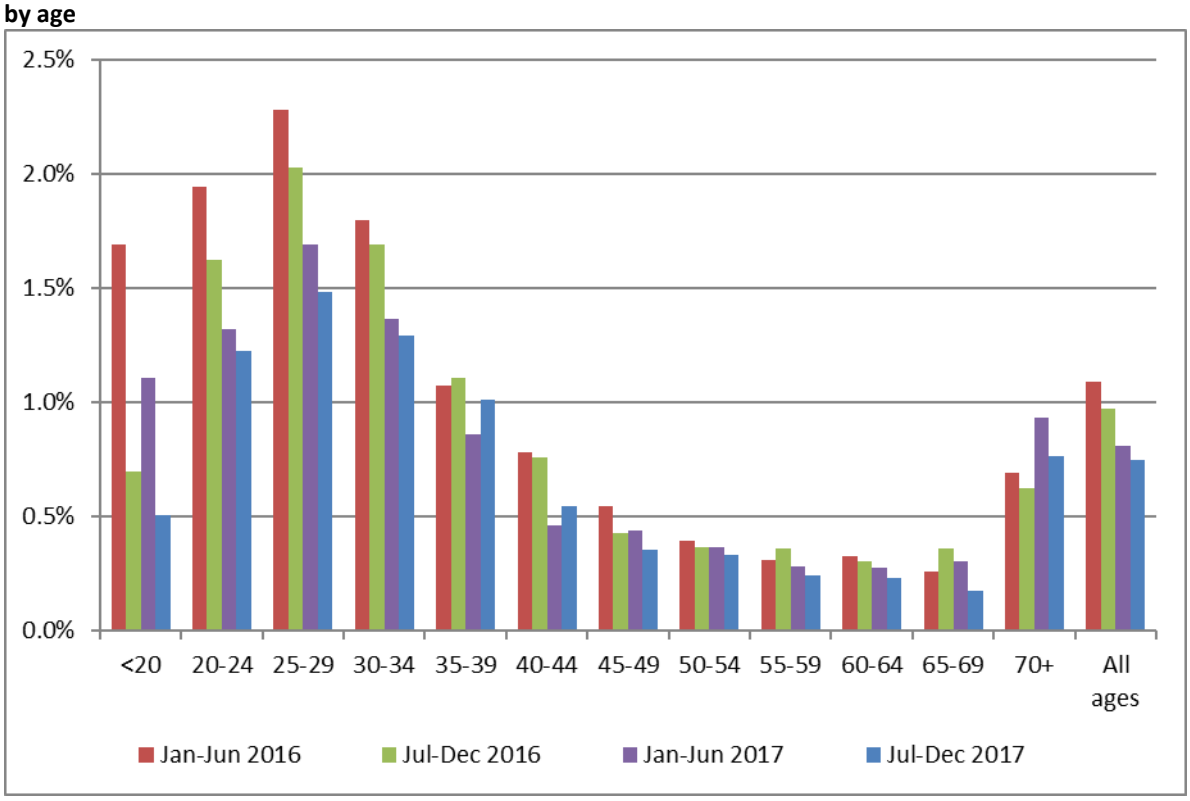
Table 5 - Laboratory reporting of cytological category by five-year age group (31 December 2017) – counts of all satisfactory samples

	Cytology Result									
Age Group	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
<20	655	23	106	4	4	-	-	-	-	792
20-24	20,117	673	2,260	225	289	-	2	-	-	23,566
25-29	21,014	534	1,219	192	345	-	11	-	-	23,315
30-34	21,395	409	765	156	297	-	18	1	-	23,041
35-39	20,036	341	525	115	215	-	17	-	-	21,249
40-44	19,996	313	471	68	114	2	15	3	-	20,982
45-49	21,909	342	470	72	81	1	14	1	-	22,890
50-54	19,764	300	387	72	68	2	26	2	-	20,621
55-59	18,339	252	322	58	46	3	31	6	1	19,058
60-64	14,621	182	225	51	35	1	24	3	1	15,143
65-69	10,933	110	162	32	20	7	15	6	-	11,285
70+	1,807	39	65	11	15	2	15	10	-	1,964
Total	**190,586**	**3,518**	**6,977**	**1,056**	**1,529**	**18**	**188**	**32**	**2**	**203,906**

Table 6 - Laboratory reporting of cytological category by five-year age group (31 December 2017) – percentage of all satisfactory samples in women of that age group

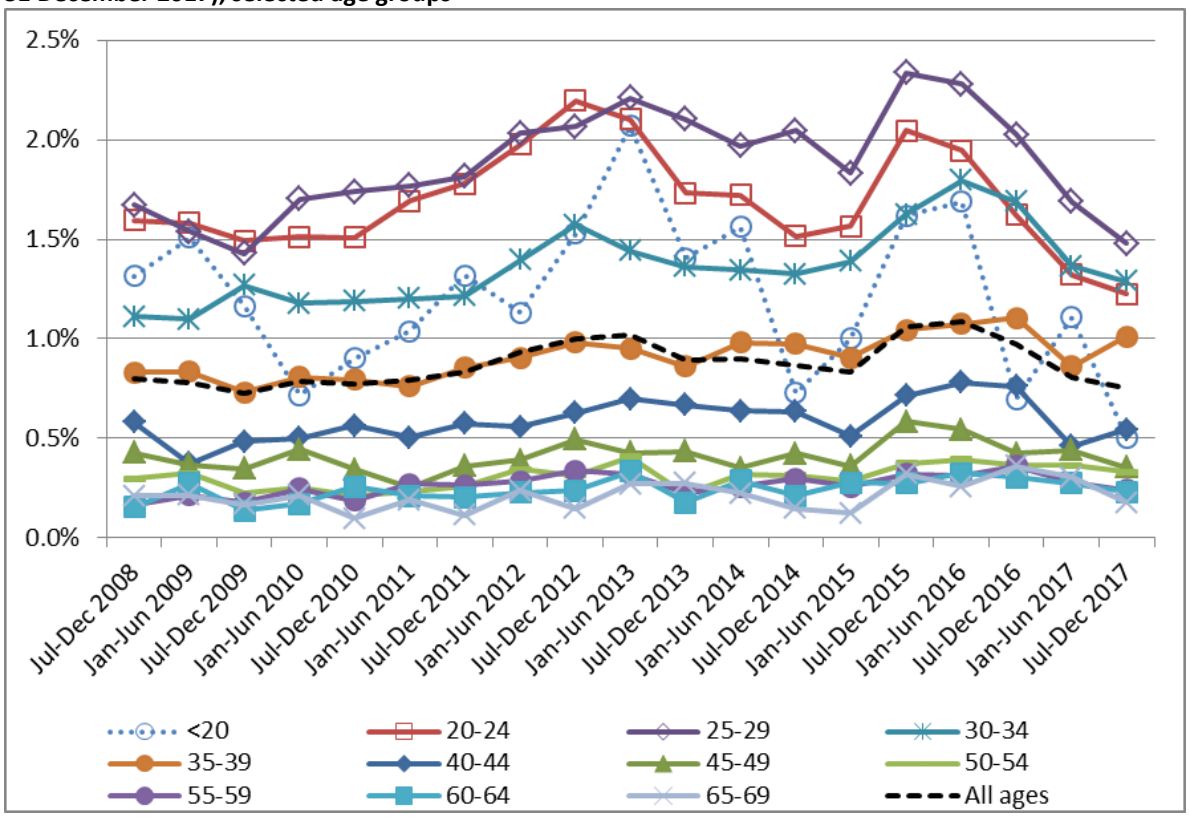
	Cytology Result								
Age Group	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**
<20	82.7	2.9	13.4	0.5	0.5	-	-	-	-
20-24	85.4	2.9	9.6	1.0	1.2	-	0.01	-	-
25-29	90.1	2.3	5.2	0.8	1.5	-	0.05	-	-
30-34	92.9	1.8	3.3	0.7	1.3	-	0.08	<0.005	-
35-39	94.3	1.6	2.5	0.5	1.0	-	0.08	-	-
40-44	95.3	1.5	2.2	0.3	0.5	0.01	0.07	0.01	-
45-49	95.7	1.5	2.1	0.3	0.4	<0.005	0.06	<0.005	-
50-54	95.8	1.5	1.9	0.3	0.3	0.01	0.13	0.01	-
55-59	96.2	1.3	1.7	0.3	0.2	0.02	0.16	0.03	0.01
60-64	96.6	1.2	1.5	0.3	0.2	0.01	0.16	0.02	0.01
65-69	96.9	1.0	1.4	0.3	0.2	0.06	0.13	0.05	-
70+	92.0	2.0	3.3	0.6	0.8	0.10	0.76	0.51	-
Total	**93.5**	**1.7**	**3.4**	**0.5**	**0.7**	**0.01**	**0.09**	**0.02**	**<0.005**

Figure 53 - Trends in the proportion of total satisfactory samples reported as HSIL (last four monitoring periods), by age



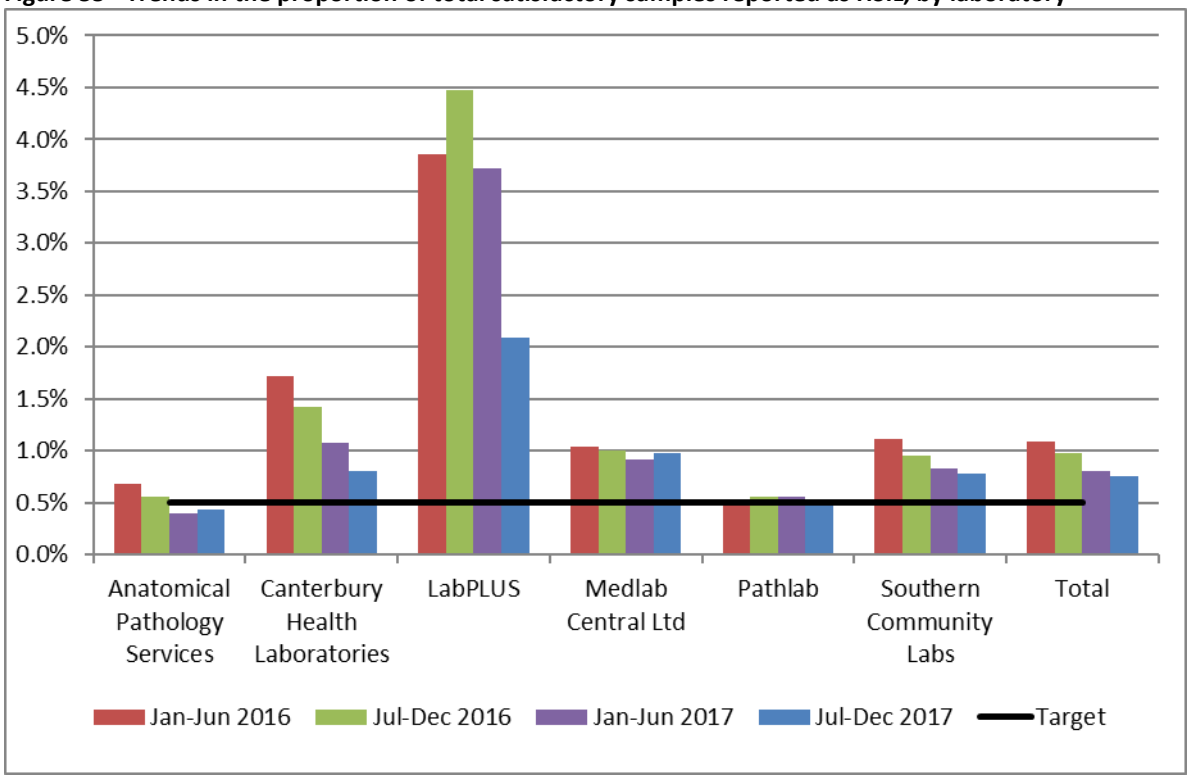
Note: women aged less than 20 years are not routinely screened

Figure 54 - Longer term trends in the proportion of total satisfactory samples reported as HSIL (to 1 January – 31 December 2017), selected age groups



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

Figure 55 - 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 2017 inclusive) were identified. 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. Histology samples taken up to five days prior to and up to six months after the cytology sample were then retrieved for women with a high-grade cytology report. 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*** 1,534 women with HSIL or SC cytology reports were identified. 119 of these women (7.8%) had no histology taken in the period from five days prior to six months after the cytology sample was taken. Among the remaining 1,415 for whom there was histology, 1,137 (80.4%) had their HSIL or SC cytology report confirmed as high-grade by histology (Figure 56, Table 51). By laboratory, the proportion of HSIL + SC being confirmed as high-grade by histology ranged from 78.6% for Pathlab to 87.5% 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 (Figure 56, Table 51). ***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*** 886 women with a cytology report of ASC-H were identified. 164 (18.5%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 722 women, 349 (48.3%) were histologically confirmed as high-grade. This proportion varied by laboratory, from 40.5% (Anatomical Pathology Services) to 65.4% (Medlab Central Ltd.) (Figure 57, Table 52).

ASC-H + HSIL + SC

A total of 2,420 women had a cytology report of ASC-H, HSIL or SC. 283 (11.7%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 2,137 women, 1,486 (69.5%) were histologically confirmed as high-grade. This proportion varied by laboratory, from 59.9% (LabPLUS) to 78.4% (Medlab Central Ltd) (Figure 57, Table 53).

Glandular abnormalities

There were 236 women with a glandular abnormality (AG1-AG5, AIS, AC1-AC4) identified. 76 women (32.2%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 160 women, 65 (40.6%) were identified as having high-grade histology. This was not analysed by laboratory, as the number of samples reported on by some laboratories were small.

Trends

HSIL + SC

Positive predictive value for HSIL and SC cytology has decreased when compared to the previous monitoring report (81.7% in the previous period; 80.4% in the current period). As in the previous monitoring period, all six laboratories had greater than 65% of their HSIL + SC cytology results confirmed by histology. The number of laboratories with PPVs above the upper target of 85% has decreased from three to one. The proportion of cytology reports with histology available following HSIL or SC results is similar (92.2% in the current report; 92.7% in the previous report). Trends in the positive predictive value for HSIL and SC cytology by laboratory are shown in Figure 58 and Figure 59. Decreases in the positive predictive value for HSIL and SC cytology were evident for all laboratories except Anatomical Pathology Services and Canterbury Health Laboratories.

ASC-H

Positive predictive value for ASC-H cytology has decreased, from 49.7% to 48.3%, however there is no target for this measure. The proportion of ASC-H cytology reports with histology available is similar in the current report compare to the previous monitoring report (81.5% in current report; 82.7% 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

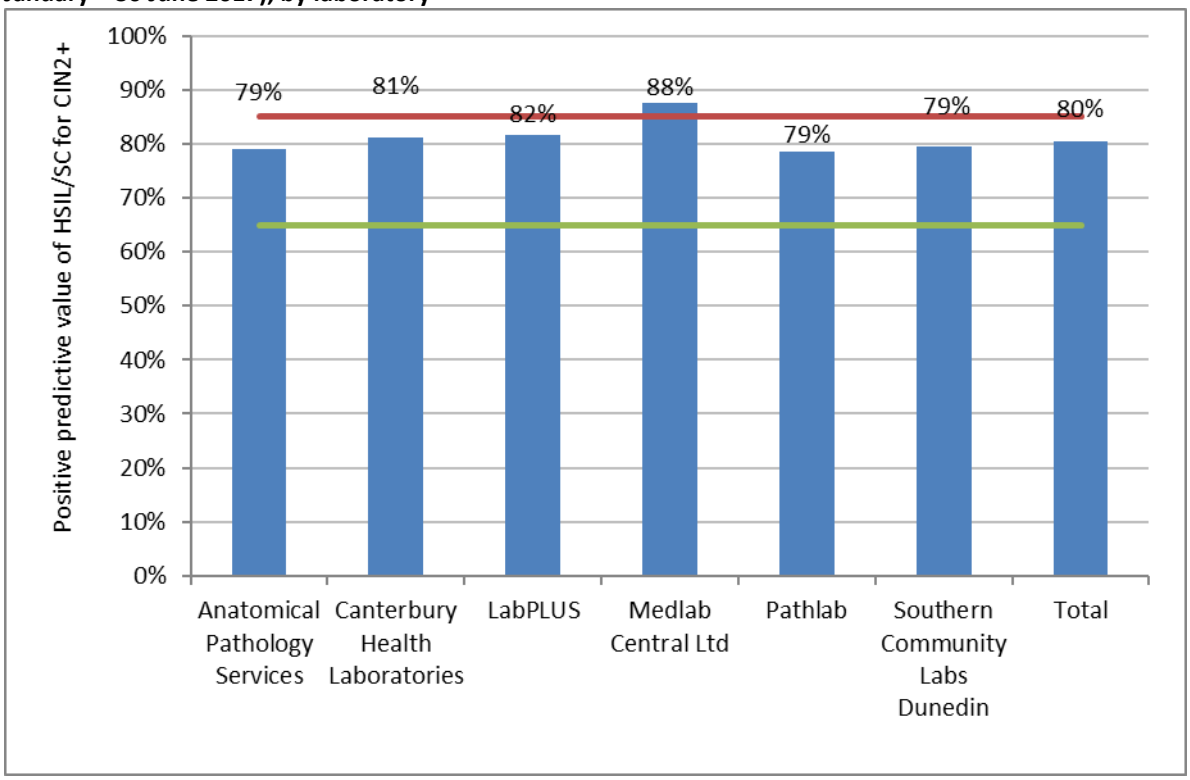
The positive predictive value for the combined group ASC-H, HSIL and SC has decreased in the current report (to 69.5%, compared to 71.5% in the previous report). Note that there is no target for the positive predictive value of this combined group. Trends in the positive predictive value for the combined group ASC-H, HSIL and SC cytology by laboratory are shown in Figure 61. Decreases in the positive predictive value for the combined group of ASC-H, HSIL and SC cytology were evident for four of six laboratories.

Glandular abnormalities

The positive predictive value of glandular abnormalities decreased (from 46.1% in the previous report to 40.6% 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 (67.8%) is lower than that in the previous monitoring period (74.1%), and remains less than that for ASC-H (81.5%) and HSIL + SC (92.2%). As a result, the positive predictive value of glandular abnormalities is more prone to fluctuations than positive predictive values for other high-grade abnormalities. Due to the small number of samples involved, glandular abnormalities were not analysed in further detail by laboratory.
Comments	This estimate does not take into account cytology predicting HSIL for which there is no histology available. Histology may be unavailable because the woman does not attend for follow-up colposcopy, or a biopsy may not be taken if the colposcopic impression is normal. When the monitoring period for this indicator is after all DHBs have started reporting in accordance the 2013 Colposcopy Standards (September 2017), it should be possible to better distinguish between these two possibilities. This can also be examined by calculating the probability of a high-grade histological report (CIN 2/3 or higher) among all women attending colposcopy after a high-grade cytology report (rather than only among the subset of women where a biopsy is taken). These results are presented in Figure 100, 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. 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 separating community vs clinic derived cytology would provide a clearer picture of positive predictive value (and other reporting categories) in a screening setting.

Figure 56 - Positive predictive value for CIN 2+ in women with HSIL or SC cytology reports (cytology in 1 January – 30 June 2017), by laboratory



Target: 65% - 85%.

Figure 57 - Positive predictive value for CIN 2+ in women with other high-grade cytology results (cytology in 1 January – 30 June 2017), by laboratory

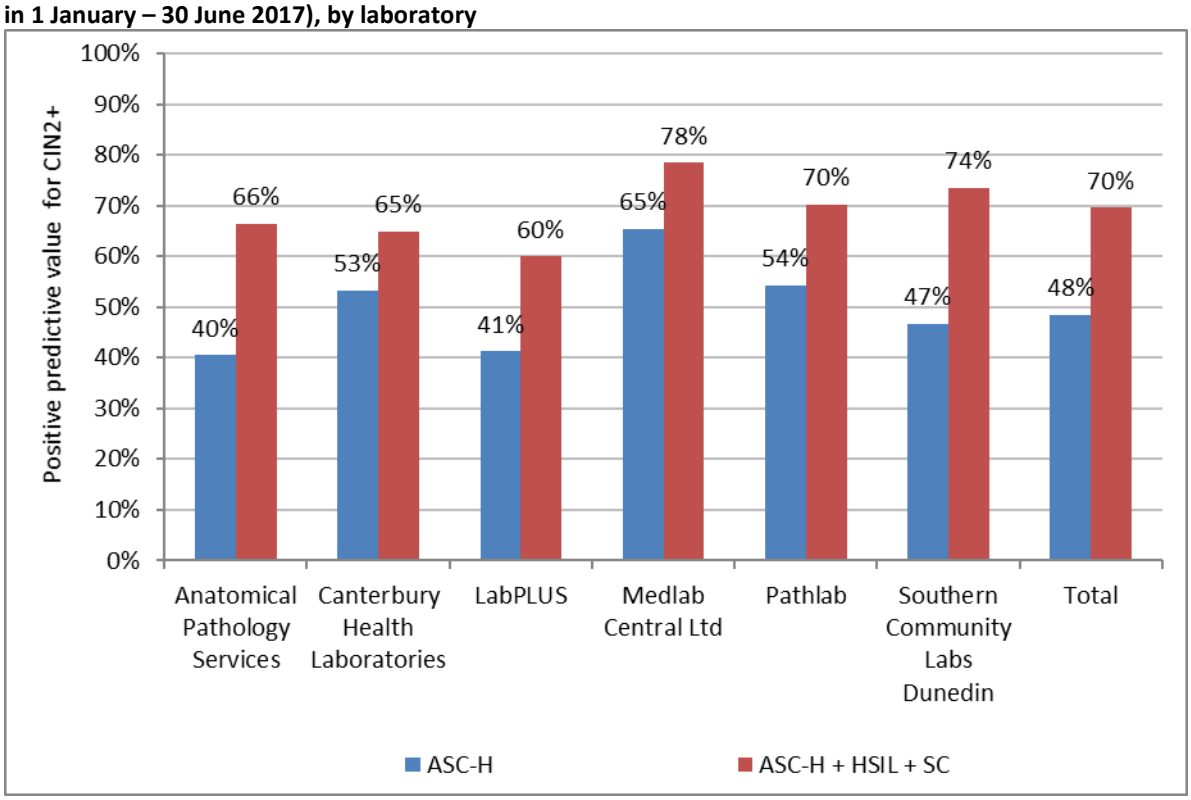
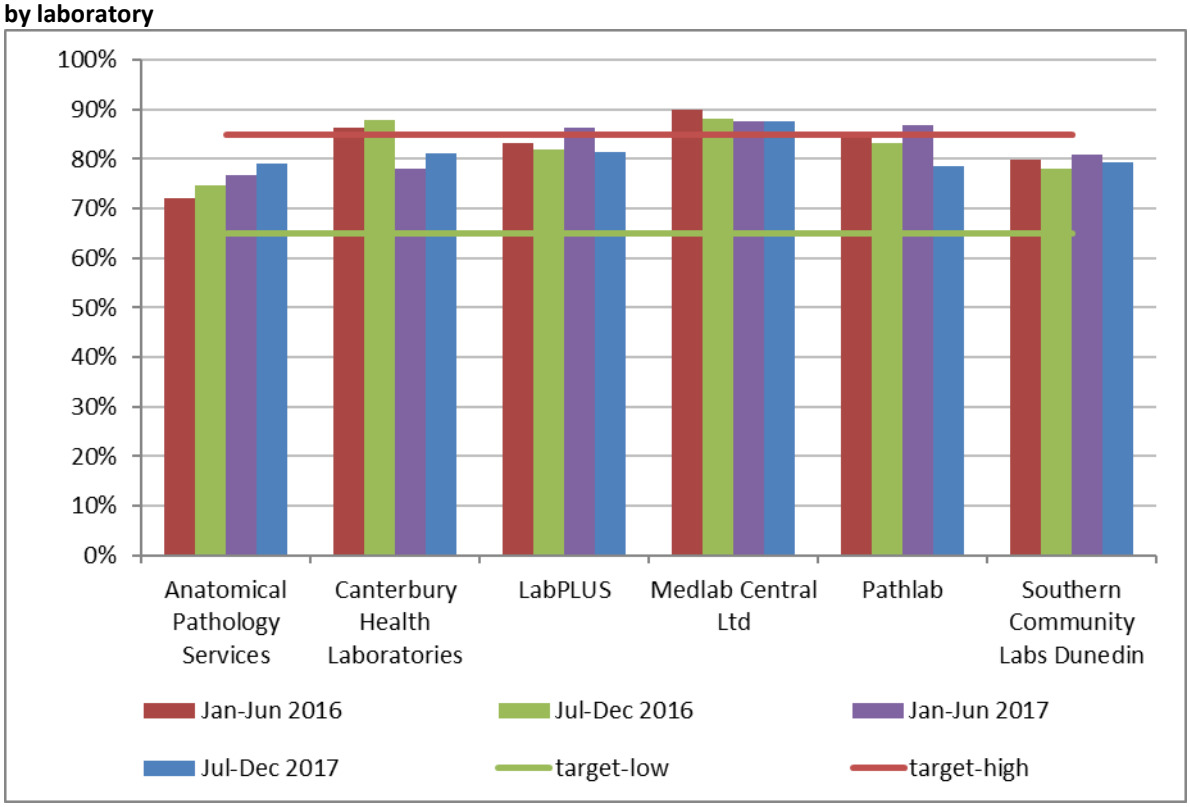


Figure 58 - Trends in the positive predictive value for CIN 2+ in women with HSIL or SC cytology results, by laboratory



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

Figure 59 - Trends in the positive predictive value for CIN 2+ in women with HSIL or SC cytology results, by laboratory, Jul-Dec 2008 – Jul-Dec 2017

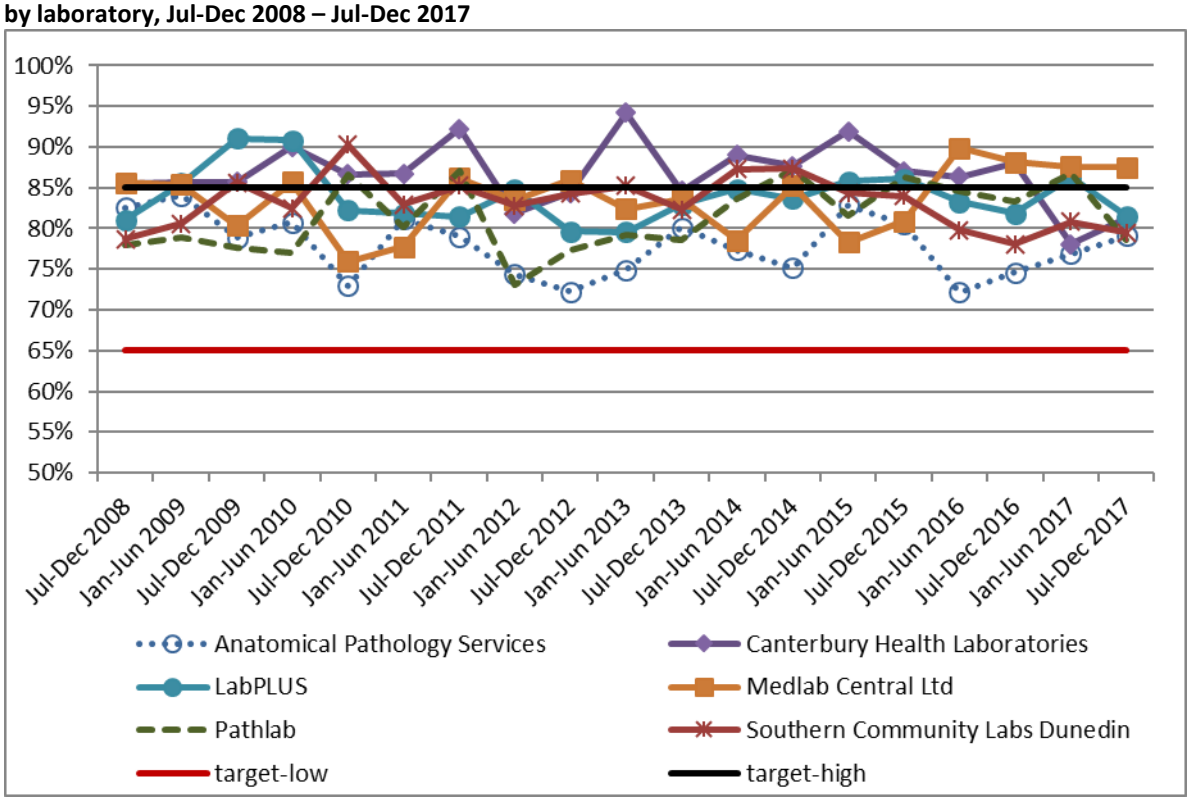
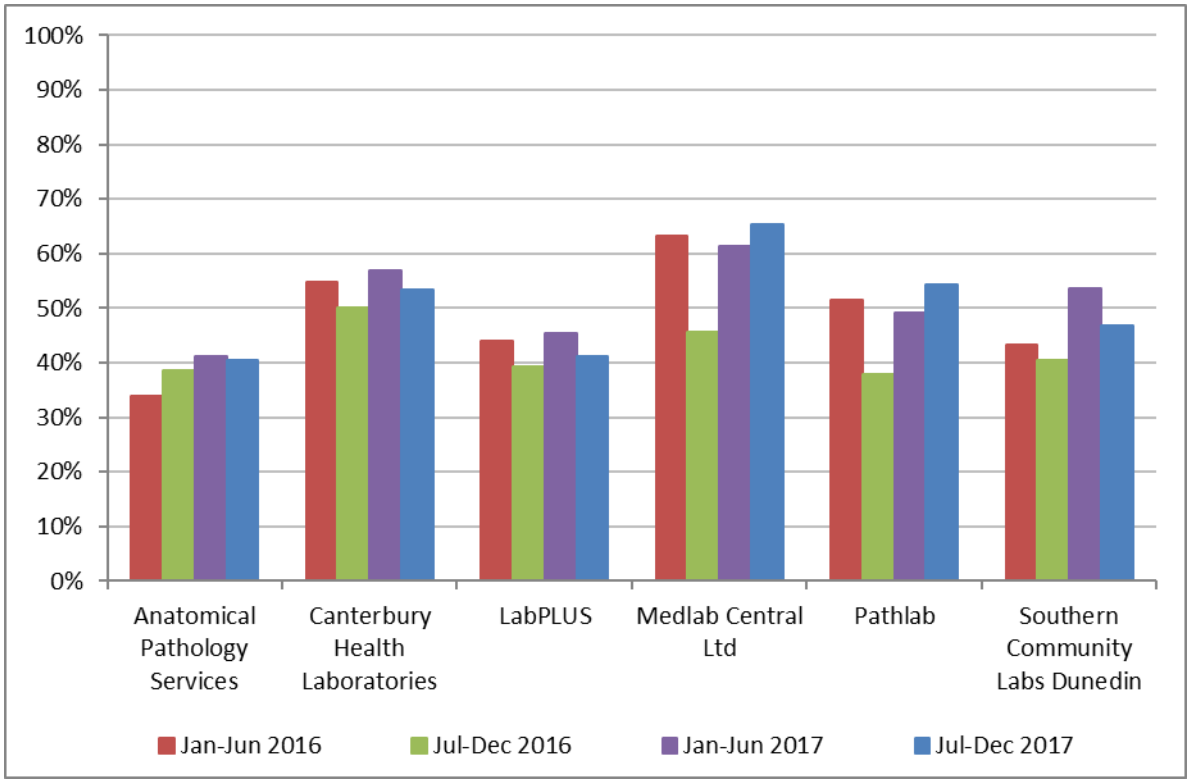
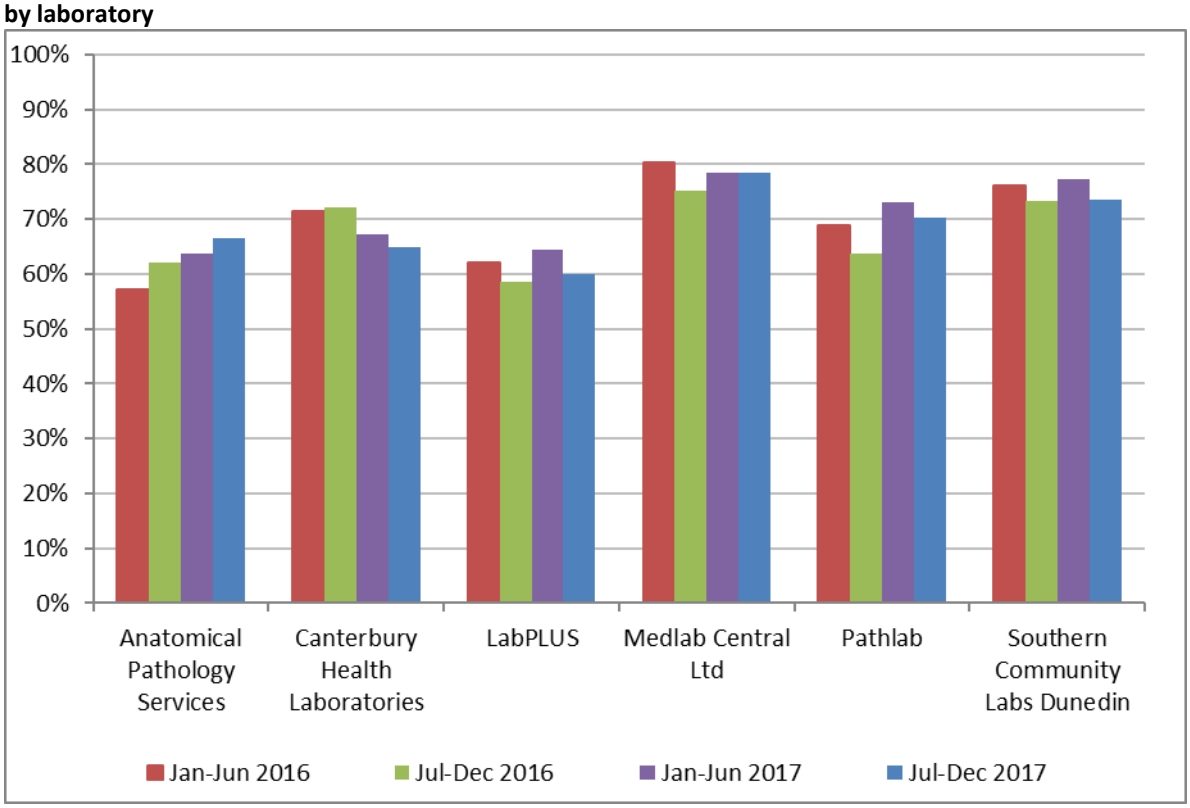


Figure 60 - Trends in the positive predictive value for CIN 2+ in women with ASC-H cytology results, by laboratory



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



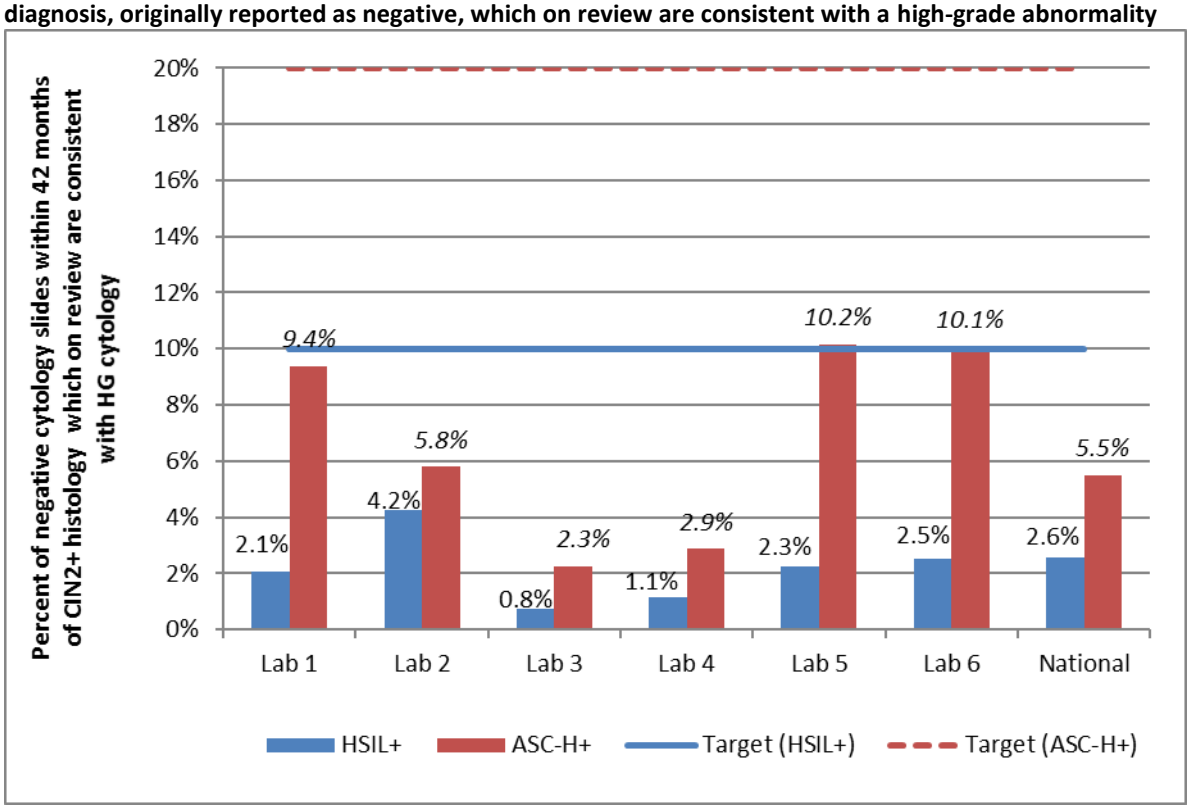
Time period relates to monitoring report period; cytology samples were collected in the period six months prior.

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 was provided by the National Screening Unit and does not identify laboratories. Data were provided for women with a histological diagnosis of high-grade/ invasive disease in the period 1 January – 31 December 2017, for whom the previous cervical smear, within the 42 months prior, was negative. Nationally, 2.6% of these previous smears were consistent with HSIL+ on review, and 5.5% were consistent with ASC-H+ on review (Figure 62). These results varied by laboratory, from 0.8% to 4.2% for HSIL+ and from 2.3% to 10.2% 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 has decreased from 2016 to 2017, the first decrease since 2014. Between this report and the previous report, the proportion of negative slides which on review were consistent with HSIL+ decreased from 2.9% to 2.6%, but

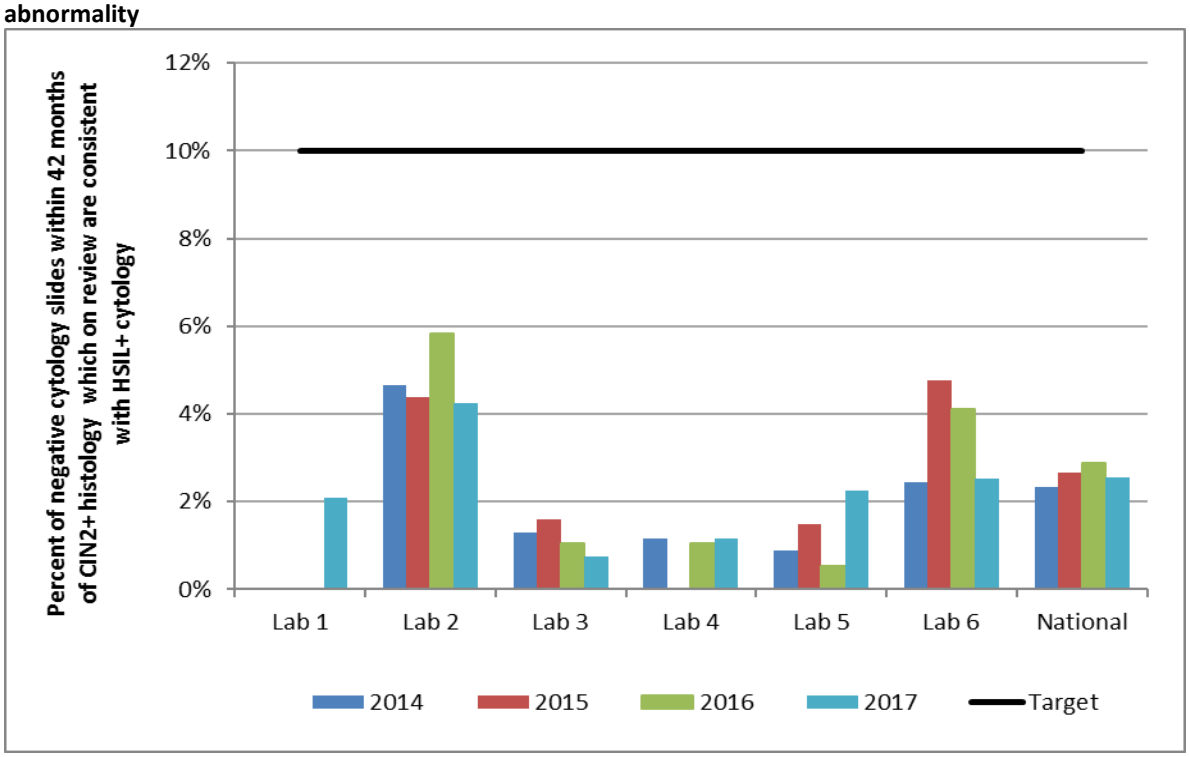
	increased from 5.1% to 5.5% for ASC-H+. Trends by laboratory are shown in Figure 63 (HSIL+) and Figure 64 (ASC-H+).
Comments	Laboratories are not identified for this indicator. One laboratory no longer reports on cervical cancer cytology and has been removed. Laboratory numbers have been modified to account for this change.

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



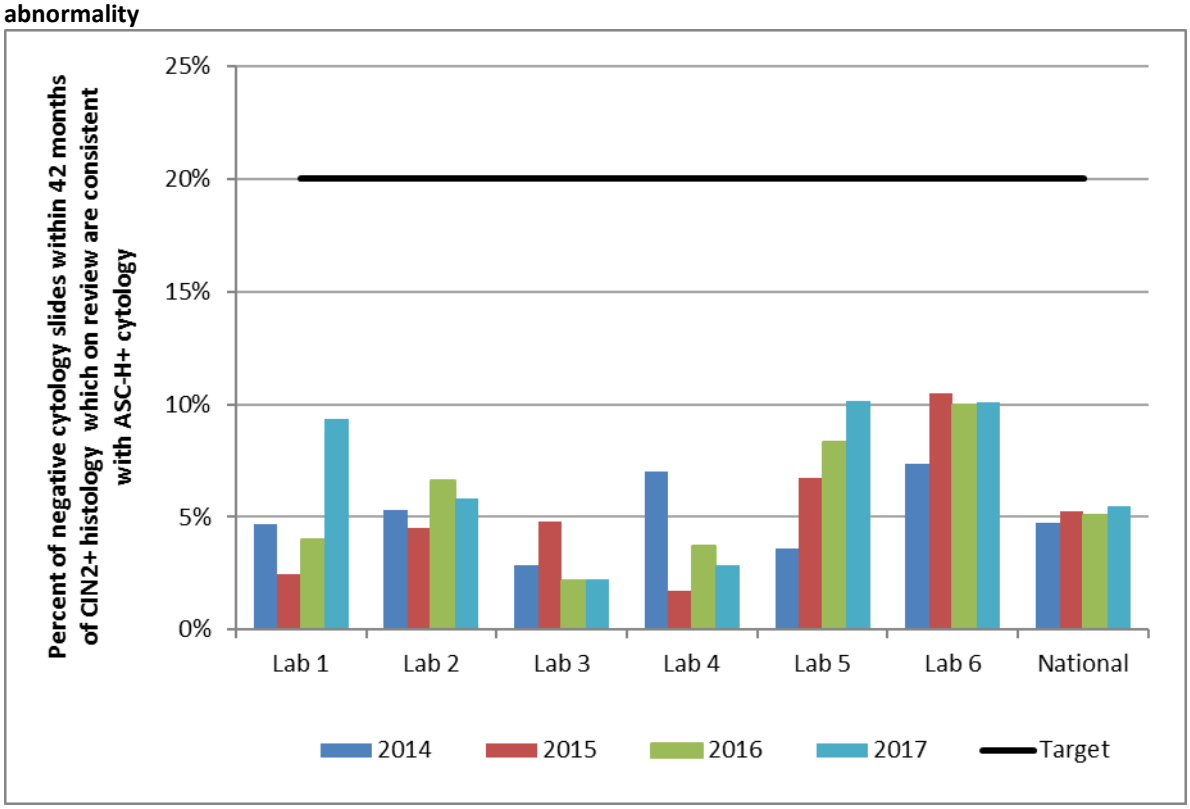
HSIL+ includes cytology interpretation codes HS1, HS2, SC, AIS or AC1-5; ASC-H+ includes cytology interpretation codes ASH, HS1, HS2, SC, AIS, AC1-5 or AG4-5 (see Appendix B – Bethesda 2001 New Zealand Modified).

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 2017).
Target	None
Current Situation	12,536 histology samples were taken during the current monitoring period. 446 (3.6%) of these were insufficient for diagnosis. These samples were taken from 440 women, 77 (17.5%) of whom have a record of a subsequent sufficient histology test. The remaining 12,090 samples were taken from 10,561 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. 56.8% of women with histology tests had negative or benign histology results (Table 8). 19.5% of women had high-grade squamous (CIN 2/3) histology results and 60 women (0.57%) had adenocarcinoma in situ. There were 55 women (0.52%) with invasive squamous cell carcinoma (ISCC) histology, 10 (0.09%) with microinvasive squamous cell carcinoma (SCC) histology and 41 (0.39%) with invasive adenocarcinoma; two (<0.05%) were adenocarcinomas arising from the endocervix and 39 (0.37%) were adenocarcinomas not arising from the endocervix. There were three 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 (1,355 women, Table 9). Among women aged 20-69 years, the age group with the lowest rate of women with results which were negative was women aged 20-24 years (35.9%, Table 10).

	Histology samples were additionally analysed after excluding 2,173 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 36.2% of the women with negative/ benign histology. This reduced the proportion with a histology result being negative/ benign from 56.8% to 45.6% of all women with a histology sample. After excluding negative/ benign histology from hysterectomy samples, this resulted in 0.49% of women with histology having an invasive adenocarcinoma result, including with adenocarcinomas arising from the endocervix (<0.05%) and women with adenocarcinomas not arising from the endocervix (0.46%). The most severe histological abnormality detected was HSIL (CIN 2/3) for 24.6% of women; ISCC for 0.66% of women; microinvasive SCC for 0.12% women; adenocarcinoma in situ for 0.72% of women; and Adenosquamous carcinoma for <0.05% of women (Table 11).
Trends	The proportion of women with negative or benign histology (56.8%; or 45.6% if benign hysterectomy samples are excluded; Table 8, Table 11) is higher to that reported for the previous period (54.6%; 43.4% if benign hysterectomy samples are excluded). The proportion of women with HSIL histology is similar in this (19.5%) and the previous period (19.8%). There was a continued decrease in the percentage of HSIL histology in the 20-24 age group in this monitoring period compared to the previous report (Figure 65). This is consistent with a reduction of proportion of satisfactory cytology samples reported as HSIL in this age group (see Indicator 5.1 and Figure 54) and with an HPV vaccine effect. The proportions were similar to those in the previous period for women with invasive adenocarcinoma not arising from the endocervix (0.35% to 0.37% in the current period), adenocarcinoma arising from the endocervix (<0.05% in both periods), and adenocarcinoma in situ (0.57% in this period and 0.58% last period). The proportion slightly increased for women with ISCC (0.52% in this period and 0.67% in the last period) and decreased for CIN1 (17.3% to 15.6% in the current period).
Comments	Histology samples include diagnostic biopsies, treatment biopsies, cervical polyps and the cervical tissue of total hysterectomy specimens. Histology samples may also include samples from non-cervical sites, where there is also a cervical component in the sample, for example endometrial samples. Also, pathologists are not always able to determine the site of origin particularly in small biopsies. “Adenocarcinoma not endocervical type” is the code that pathologists use for adenocarcinomas involving the cervix, but not primarily arising from the cervix. This means that the code category of endocervical adenocarcinoma of endocervical type should equate much more closely with data held on the Cancer Registry. In addition, it has been identified that the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, “invasive adenocarcinoma not endocervical type” may be over reported and “invasive

adenocarcinoma endocervical type" under-reported in these laboratories. This is in the process of being corrected.

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

Table 7 - Histology results reporting by SNOMED category

SNOMED category	Women with that diagnosis N	%
Negative/normal	3,208	30.4
Inflammation	644	6.1
Microglandular hyperplasia	11	0.10
Squamous metaplasia	369	3.5
Polyp	1,356	12.8
Other*	406	3.8
Atypia	56	0.53
Benign glandular atypia	2	<0.05
HPV	647	6.1
Condyloma acuminatum	6	0.06
CIN 1 (LSIL) or VAIN 1	1,561	14.8
Dysplasia/CIN NOS	26	0.25
Glandular dysplasia	-	-
CIN 2 (HSIL) or VAIN 2	826	7.8
HSIL not otherwise specified	46	0.44
CIN 3 (HSIL) or VAIN 3	1,190	11.3
Adenocarcinoma in situ	60	0.57
Microinvasive squamous cell carcinoma	10	0.09
Invasive squamous cell carcinoma	55	0.52
Adenocarcinoma (arising from the endocervix)	2	<0.05
Invasive adenocarcinoma (not arising from the endocervix)	39	0.37
Adenosquamous carcinoma	3	<0.05
Undifferentiated carcinoma	-	-
Sarcoma	3	<0.05
Carcinosarcoma	-	-
Choriocarcinoma	-	-
Miscellaneous primary tumour	1	<0.05
Metastatic tumour	12	0.11
Small cell carcinoma	1	<0.05
Malignant tumour, small cell type	-	-
Melanoma	1	<0.05
Other primary epithelial malignancy	19	0.18
Total	**10,561**	**100.0**

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)	5,996	56.8
HPV	653	6.2
CIN1	1,643	15.6
Glandular dysplasia	-	-
CIN 2	826	7.8
HSIL not otherwise specified	46	0.44
CIN 3	1,190	11.3
Adenocarcinoma in situ	60	0.57
Microinvasive	10	0.09
Invasive squamous cell carcinoma	55	0.52
Adenocarcinoma (arising from the endocervix)	2	<0.05
Invasive adenocarcinoma (not arising from the endocervix)	39	0.37
Adenosquamous carcinoma	3	<0.05
Other cancer	38	0.36
Total	**10,561**	**100.0**

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

Table 9 - Histology results by age – counts

	Age group												
Histology Diagnostic Category	**<20**	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65-69**	**70+**	**Total**
Negative/benign (non neoplastic)	15	320	372	498	589	793	1,037	833	613	358	297	271	5,996
HPV	2	100	107	89	83	65	73	63	36	14	15	6	653
CIN1	8	383	309	270	186	141	114	92	62	45	26	7	1,643
Glandular dysplasia	-	-	-	-	-	-	-	-	-	-	-	-	-
CIN 2	7	198	200	129	110	50	35	40	22	25	6	4	826
HSIL not otherwise specified	-	9	11	10	4	5	5	-	-	1	-	1	46
CIN 3	-	155	290	274	181	96	70	41	32	21	20	10	1,190
Adenocarcinoma in situ	-	3	11	12	15	4	7	1	3	2	2	-	60
Microinvasive	-	-	1	2	1	3	3	-	-	-	-	-	10
Invasive squamous cell carcinoma	-	1	3	4	6	5	5	6	7	3	7	8	55
Adenocarcinoma (arising from the endocervix)	-	-	-	1	-	-	-	-	-	1	-	-	2
Invasive adenocarcinoma (not arising from the endocervix)	-	-	1	-	4	5	3	6	7	4	4	5	39
Adenosquamous carcinoma	-	-	-	-	-	1	1	1	-	-	-	-	3
Other cancer	-	-	-	2	2	2	2	2	3	9	6	10	38
Total	**32**	**1,169**	**1,305**	**1,291**	**1,181**	**1,170**	**1,355**	**1,085**	**785**	**483**	**383**	**322**	**10,561**

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)	46.9	27.4	28.5	38.6	49.9	67.8	76.5	76.8	78.1	74.1	77.5	84.2
HPV	6.3	8.6	8.2	6.9	7.0	5.6	5.4	5.8	4.6	2.9	3.9	1.9
CIN1	25.0	32.8	23.7	20.9	15.7	12.1	8.4	8.5	7.9	9.3	6.8	2.2
Glandular dysplasia	-	-	-	-	-	-	-	-	-	-	-	-
CIN 2	21.9	16.9	15.3	10.0	9.3	4.3	2.6	3.7	2.8	5.2	1.6	1.2
HSIL not otherwise specified	-	0.77	0.84	0.77	0.34	0.43	0.37	-	-	0.21	-	0.3
CIN 3	-	13.3	22.2	21.2	15.3	8.2	5.2	3.8	4.1	4.3	5.2	3.1
Adenocarcinoma in situ	-	0.26	0.8	0.9	1.27	0.34	0.52	0.09	0.38	0.41	0.52	-
Microinvasive	-	-	0.08	0.15	0.08	0.26	0.22	-	-	-	-	-
Invasive squamous cell carcinoma	-	0.09	0.23	0.31	0.51	0.43	0.37	0.55	0.89	0.62	1.8	2.5
Adenocarcinoma (arising from the endocervix)	-	-	-	0.1	-	-	-	-	-	0.2	-	-
Invasive adenocarcinoma (not arising from the endocervix)	-	-	0.1	-	0.3	0.4	0.2	0.6	0.9	0.8	1.0	1.6
Adenosquamous carcinoma	-	-	-	-	-	0.09	0.07	0.09	-	-	-	-
Other cancer	-	-	-	0.15	0.17	0.17	0.15	0.18	0.38	1.86	1.6	3.1
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**

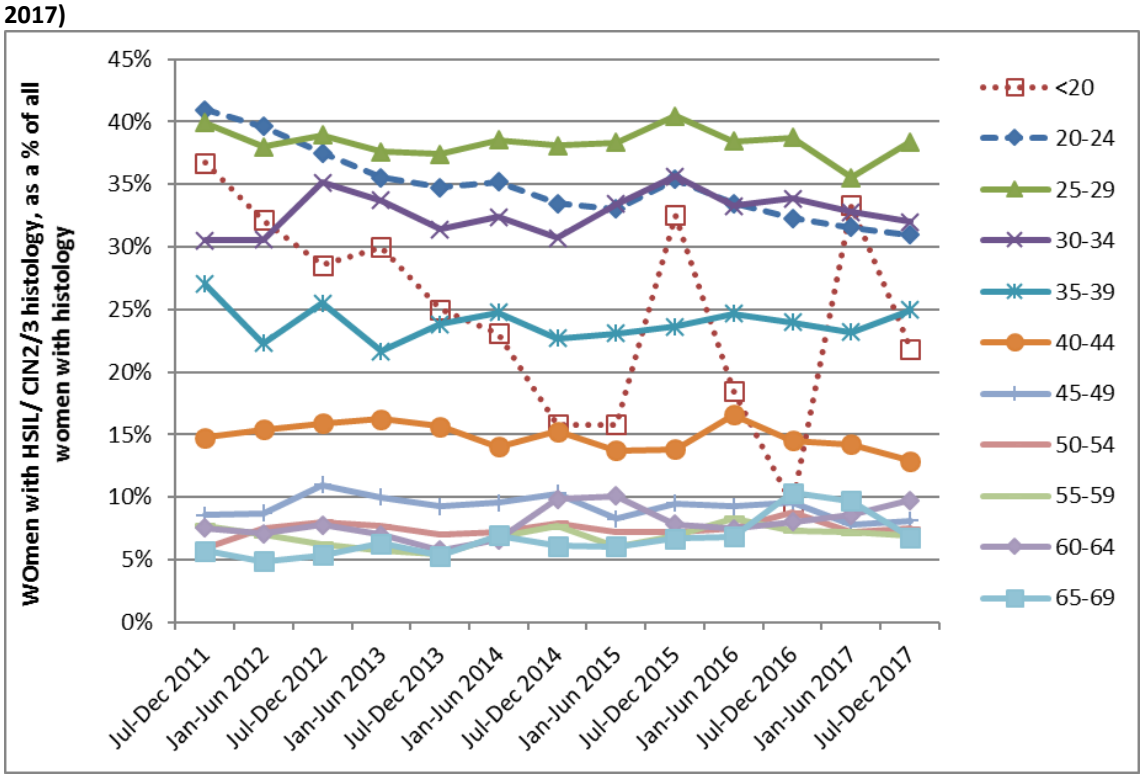
HSIL not otherwise specified = high-grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (SNOMED code M67017; see Appendix C).
Note: the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive 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)	3,823	45.6
HPV	653	7.8
CIN1	1,643	19.6
Glandular dysplasia	-	-
CIN 2	826	9.8
HSIL not otherwise specified	46	0.55
CIN 3	1,190	14.2
Adenocarcinoma in situ	60	0.72
Microinvasive	10	0.12
Invasive squamous cell carcinoma	55	0.66
Invasive adenocarcinoma (arising from the endocervix)	2	<0.05
Invasive adenocarcinoma (not arising from the endocervix)	39	0.46
Adenosquamous carcinoma	3	<0.05
Other cancer	38	0.45
Total	8,388	**100.0**

**Partial with cervical component. Details of mapping between SNOMED category and diagnostic category are included in Appendix C. HSIL not otherwise specified = high-grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (SNOMED code M67017; see Appendix C). Results differ from those in Table 8 due to the exclusion of negative/ benign results from partial/ total hysterectomy samples.*
Note: the SNOMED codes that distinguish the two categories of adenocarcinoma have not been utilised consistently by some laboratories. Consequently, "invasive adenocarcinoma not endocervical type" may be over reported and "invasive adenocarcinoma endocervical type" under-reported in these laboratories.

Figure 65 - Trends in histologically-confirmed HSIL as a percentage of all women with histology (Jul-Dec 2017)



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[12]). ***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[12]). ***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 207,566 cytology samples during the current monitoring period. Overall, 96.3% of cytology samples were reported on within seven working days, which meets the target of 90% (Table 54). Nationally, 99.2% were reported on within 15 working days, which meets the target of 98%. Five of the six laboratories met the target for 90% of cytology samples to be reported to sample takers in seven working days or less (Anatomical Pathology Services, Canterbury Health Laboratories, LabPLUS, Pathlab, Southern Community Laboratories Dunedin), while the sixth (Medlab Central Ltd.) reported on 88.5% of cytology samples within seven days (Figure 66, Table 54).

Five of the six laboratories also met the target of 98% of samples reported within 15 working days (Anatomical Pathology Services, Canterbury Health Laboratories, Medlab Central Ltd., Pathlab, Southern Community Laboratories Dunedin). The remaining laboratory, LabPLUS, reported on 97.8% of reports within 15 days (Figure 67, Table 54).

Histology

Fourteen laboratories received 12,550 histology samples in the current monitoring period. Overall 94.0% 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 55). Nine of the 14 laboratories met the target of 90% of final histology results to referring colposcopists within ten working days of receipt of the sample (Anatomical Pathology Services, Canterbury Health Laboratories, Medlab Central Ltd., Middlemore Hospital Laboratory, Nelson Hospital Laboratory, North Shore Hospital Laboratory, Southern Community Laboratories Dunedin, Southern Community Laboratories Wellington, Taranaki) (Figure 68). Six laboratories met the target of 98% of final histology results reported to the requestor within 15 working days of receiving the sample (Figure 69, Table 55). Four of the remaining eight laboratories had reported on at least 95% of samples within 15 days (Figure 69, Table 55). The proportion of histology samples reported on within 15 days ranged from 81.3% (Waikato Hospital Laboratory) to 99.7% (Southern Community Laboratories Dundedin and Taranaki Medlab).

Low-grade cytology with associated HPV triage testing

Six laboratories received 2,780 cytology samples during the current monitoring period which were associated with HPV testing for the purpose of triage of low-grade abnormalities. Overall, 99.0% 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 96.2% (Medlab Central Ltd.) to 99.7% (Anatomical Pathology Services) (Figure 70, Table 56).

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 (99.0%) 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 70). Medlab Central Ltd. reported below the target level for cytology associated with low-grade triage HPV testing (96.2%) but achieved the target for cytology overall (98.4%).

Trends

Cytology

The overall proportion of samples reported on within seven working days in the current report is similar to the proportion reported in the previous monitoring period (both 96.3%). Five laboratories meet the target in this

monitoring period which is one less laboratory compared to the previous reporting period. The proportion of samples reported on within 15 working days was similar to what was reported in the previous monitoring period (99.2% compared to 99.0% in the previous monitoring period). Five laboratories met the target of reporting 98% of samples within 15 working days, which is one less than the previous report.

Histology

The proportion of histology samples reported on within ten working days is similar in this and the previous report (from 93.6% to 94.0%). Nine laboratories achieved the ten-working-days target in this monitoring period compared to eleven 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 97.1% in the previous report). Six laboratories meet the target in this period compared to four in the previous report. In the current period, ten of the 14 laboratories had reported on at least 95% of samples within 15 days, which is one fewer 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 slightly higher than the previous report – from 98.5% to 99.0%. Two additional laboratories met the target of reporting 98% of final cytology test results within 15 working days compared to the previous report.

Comments

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

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

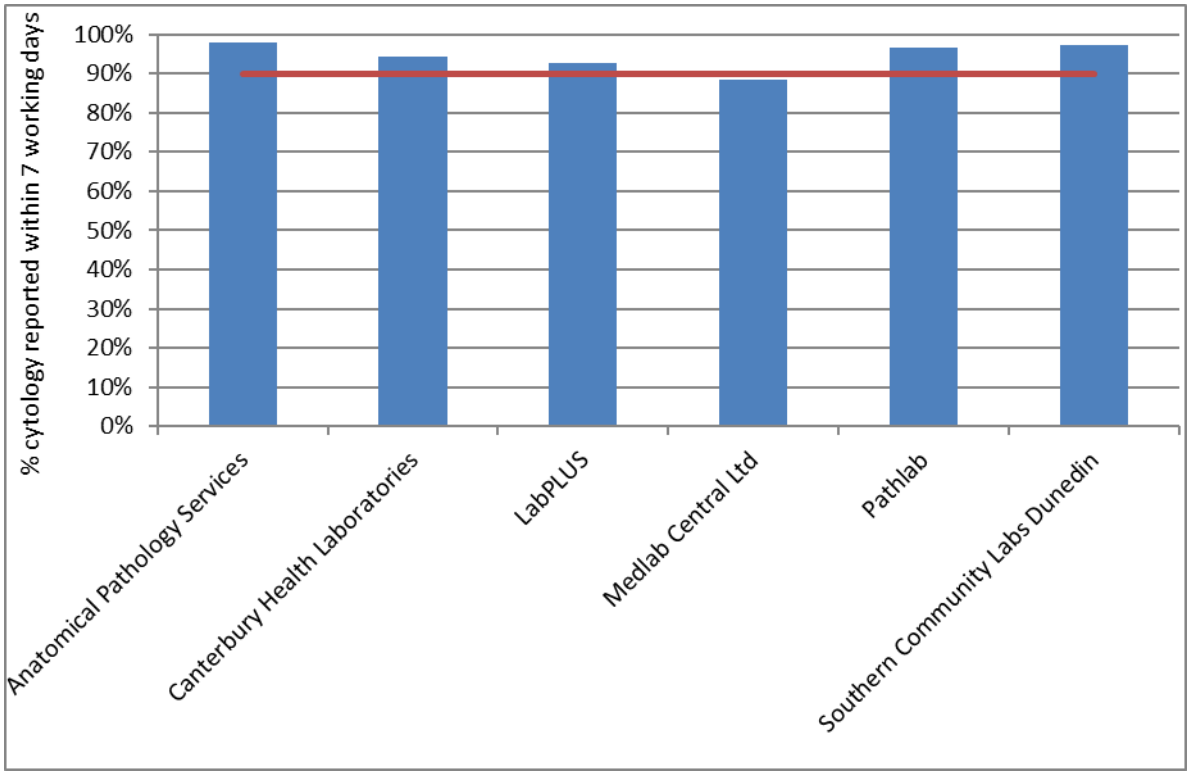
Turnaround time performance may be underestimated due to limitations in the report date recorded on NCSP Register. When amended reports are sent to the NCSP Register, the report date in the NCSP Register is updated to reflect the date on which the report was re-transmitted after the amendments are made.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

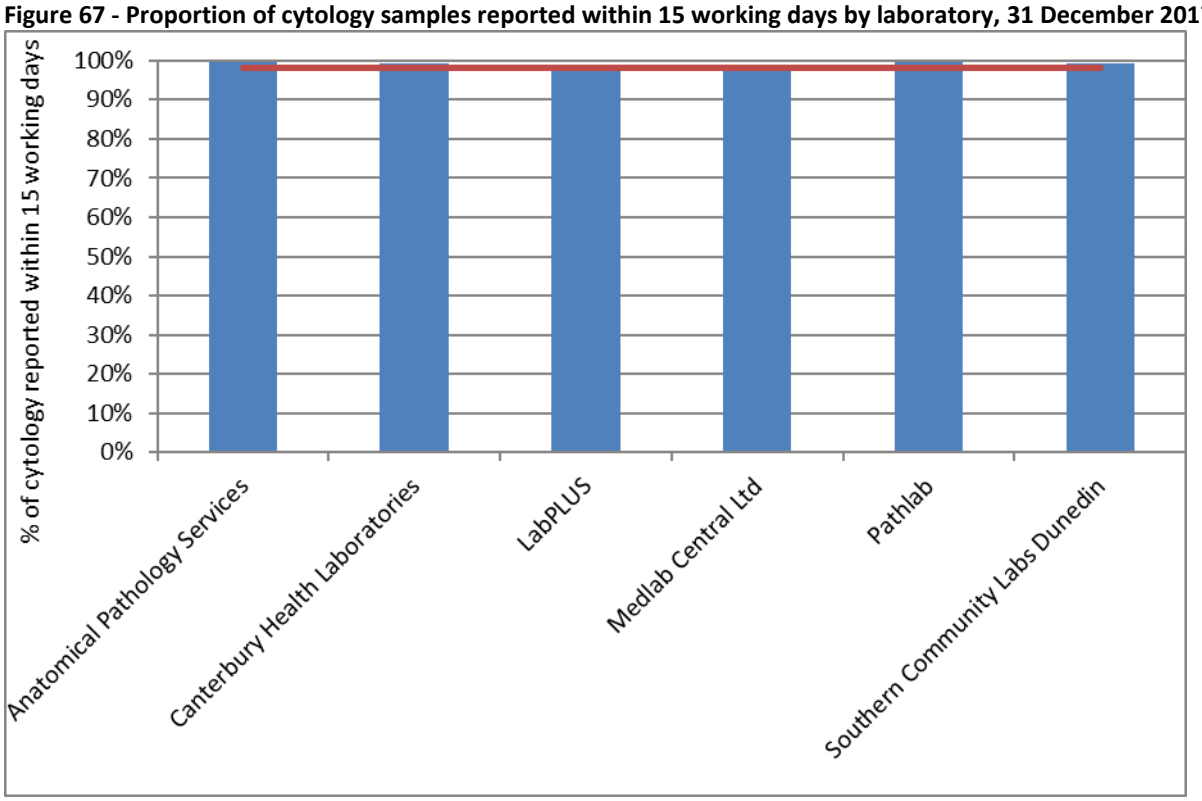
Caution must be taken when comparing percentages of reporting from this monitoring period to previous monitoring periods due to changes in the number of reporting laboratories. Differences in percentages from this and previous monitoring reports may be due to differences in caseloads.

Figure 66 - Proportion of cytology samples reported within seven working days by laboratory, 31 December 2017



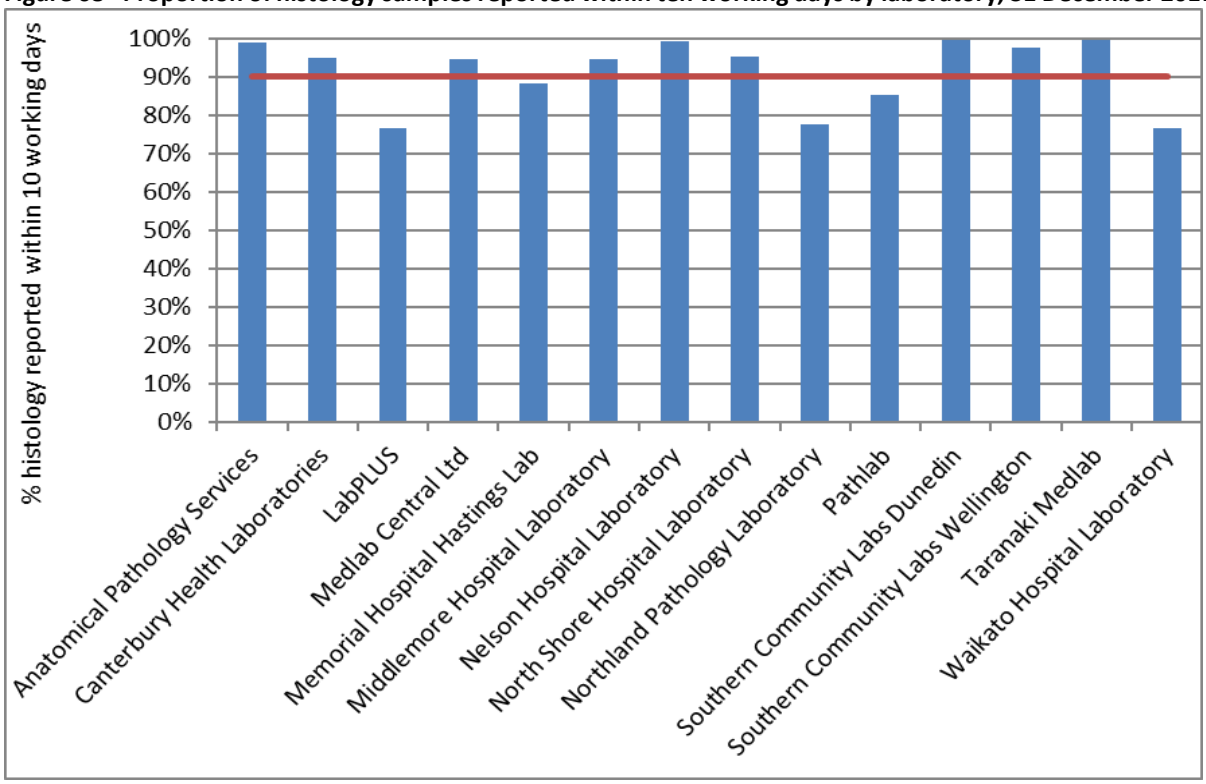
Target: 90% within seven working days (red line)

Figure 67 - Proportion of cytology samples reported within 15 working days by laboratory, 31 December 2017



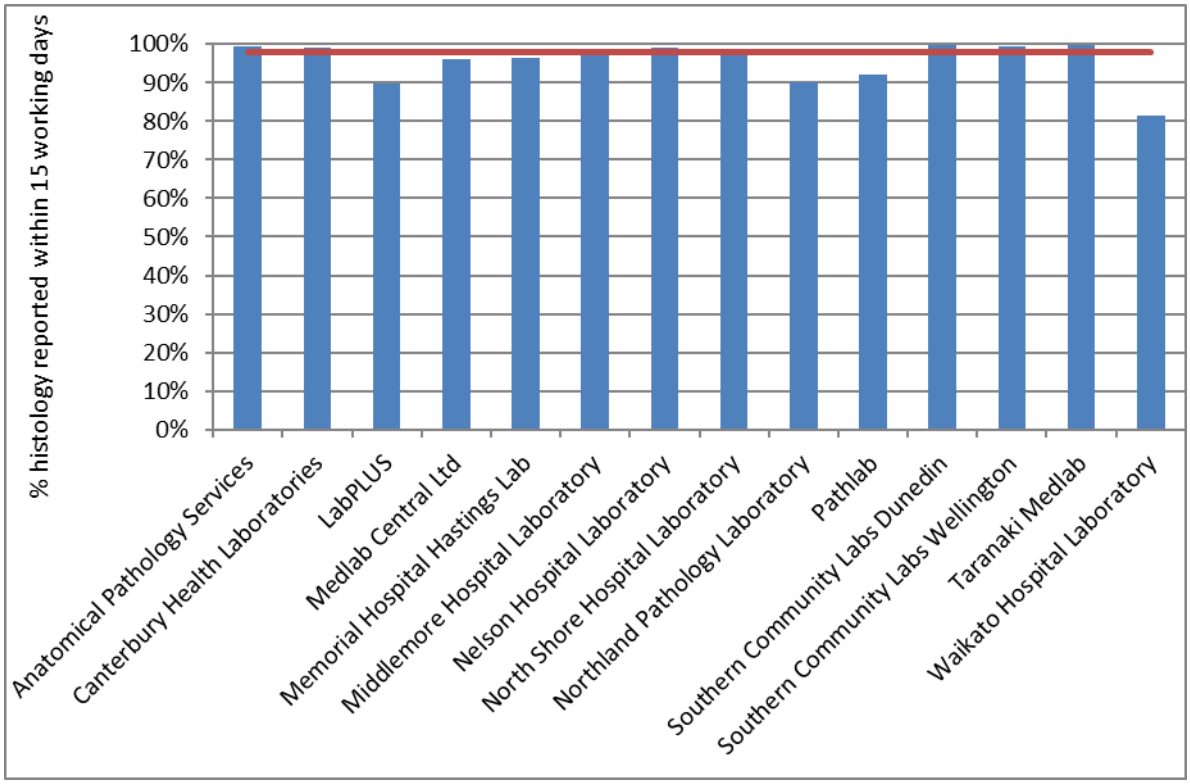
Target: 98% within 15 working days (red line)

Figure 68 - Proportion of histology samples reported within ten working days by laboratory, 31 December 2017



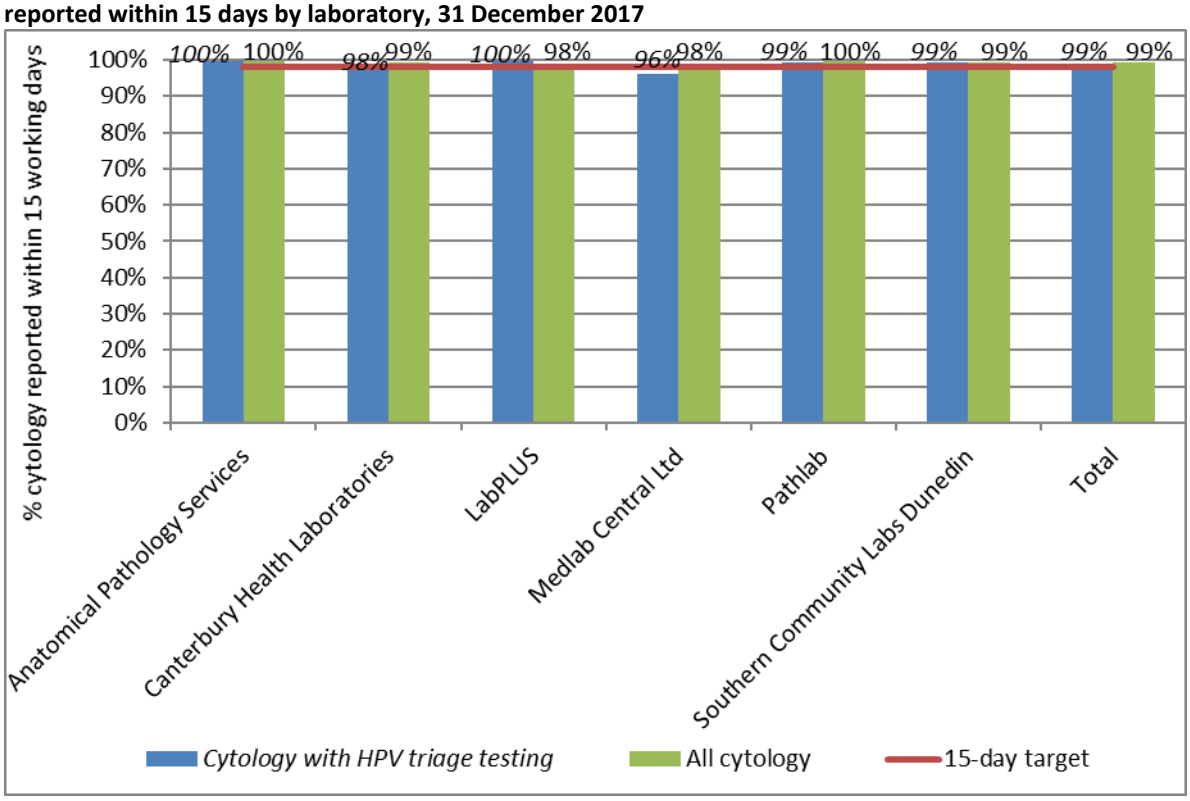
Target: 90% within ten working days (red line)

Figure 69 - Proportion of histology samples reported within 15 working days by laboratory, 31 December 2017



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

Figure 70 - Proportion of cytology samples with associated HPV triage testing and of all cytology samples reported within 15 days by laboratory, 31 December 2017



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

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

Definition

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

Each woman with a high-grade cytology result, relating to a cytology sample taken in the six months preceding the current monitoring period (i.e. sample taken in the period of 1 January - 30 June 2017), is followed for any histology samples taken on or after the date of the cytology sample. The period of time between the cytology and histology reports relating to these samples is calculated. The proportion of women with a histology report up to and including 90 days after their cytology report is calculated. Histology reports which occur prior to the cytology report are included, as long as the histology sample was not taken before the cytology sample, to allow for differences in turnaround times between cytology and histology.

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

For the purposes of this indicator, the following Bethesda 2001 (New Zealand modified; TBS 2001 NZ modified)[13] 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 2017).

Target	90% of women should have a histology report within 90 days of their cytology report date. 99% of women should have a histology report within 180 days of their cytology report.
Current Situation	There were 2,951 high-grade cytology results relating to samples collected in the period 1 January - 30 June 2017; 1,197 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 1,754 cytology results, which related to 1,749 women. Histological follow-up for these 1,749 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, 1,451 women (83.0%) had a histology report within 90 days of their cytology report, and 1,544 (88.3%) had a histology report within 180 days. These were below the targets of 90% within 90 days and 99% within 180 days. The proportion of women with a histology report varied by DHB from 72.2% (West Coast) to 93.0% (Hutt Valley) within 90 days of their cytology report, and from 81.0% (Auckland) to 95.5% (Canterbury) within 180 days of their cytology report (Figure 71, Table 12). Three DHBs met the target for the proportion of women with histology within 90 days (Canterbury, Hutt Valley and Southern, with 91.4%, 93.0% and 92.6% of histology reported within 90 days of a high-grade cytology report, respectively), however no DHB met the target for 180 days. As shown in Table 12, some DHBs had a relatively small number of women with a high-grade cytology result recorded in the period (including Wairarapa, West Coast and Whanganui, with 19, 18 and 21 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 61.8% (ages 65-69) to 91.0% (ages 40-44 years) within 90 days, with the target being met for women in the 40-44 years age group. The target was not met in any age group for 180 days and ranged from 71.4% (ages 50-54 years) to 96.4% (ages 40-44 years) within 180 days (Table 13). There was some variation by ethnicity in the proportion of women with histological follow-up, however the targets were not met for any group of women. At 90 days, the proportion of women with histological follow-up ranged from 68.6% (Pacific women) to 85.7% (European/ Other woman; Table 14). By 180 days, however, the difference had narrowed, and the proportion with histology reports ranged from 76.7% (Pacific women) to 90.2% (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 57 and Table 58.

Among women with an urgent referral, due to a suspicion of invasive disease, (N=73), a histology report was available within 90 days for 83.6% of women and within 180 days for 86.3% 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), 82.9% 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 149 women (8.5%) who had no record of any subsequent follow-up within 90 days and 100 women (5.7%) who had no record of any subsequent follow-up within 180 days on the NCSP Register (Table 17).

This varied by DHB, from no women without follow-up (Wairarapa) to 14.5% (Counties Manukau) of women without follow-up of some kind by 90 days, and from no women (Wairarapa) to 10.2% (Counties Manukau) of women without follow-up of some kind by 180 days (Figure 72, Table 17). Among the DHBs where there remained women without follow-up, at 90 days, the number remaining was ten or fewer in 13 DHBs and was a maximum of 24 women (14.5%) in Counties Manukau. At 180 days, the number remaining without follow-up was ten or fewer in 17 DHBs, with a maximum of 17 women (10.2%) without follow-up 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 woman) to 17.4% (Pacific woman) at 90 days and from 4.3% (European/ Other woman) to 10.5% (Pacific women) at 180 days (Table 18, Figure 73).

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 87.7% of women and 89.0% within 180 days (Table 16). At 180 days, there remained eight women (11.0%) 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 94.5% within 180 days (Table 16). At 180 days, there remained 92 women (5.5%) for whom no follow-up tests were recorded.

Trends

Histological follow-up

The proportion of women with a histology report within 90 days has increased slightly since the previous monitoring period (from 82.2% to 83.0% in the current period). The proportion of women with a histology report within 180 days has decreased (from 89.6% in the previous period to 88.3% in the current period).

While the proportion of women with histological follow-up at 90 days has increased overall and follow-up at 180 days has decreased overall, this still varies for individual DHBs (Figure 74, Figure 75). In five DHBs the proportion of women with histological follow-up has decreased at 90 days and at 180 days (Auckland, Bay of Plenty, Counties Manukau, Lakes, and Wairarapa). In four DHBs, the proportion of women with histological follow-up increased at both 90 days and at 180 days (Canterbury, Mid Central, Southern and Tairawhiti).

The proportion of women with follow-up histology at 90 days in the current monitoring period has increased since the previous report for Māori women (from 74.3% to 78.9%) and European/ Other women (from 84.4% to 85.7%); and has decreased for Pacific women (from 77.8% to 68.6%) and Asian women (from 80.6% to 77.6%) with follow-up histology within 90 days over the last two monitoring periods. The proportion of women with follow-up histology at 180 days has increased for Māori women (from 85.5% to 86.1%) and decreased for the remaining ethnic groups (87.8% to 76.7% for Pacific; 89.3% to 84.1% for Asian woman; and from 90.7% to 90.2% for European/ Other women). The proportions of women with follow-up histology are quite variable within individual DHBs when broken down by DHB and ethnicity, as the number of women with high-grade cytology generally becomes comparatively small when broken down in those categories (except in some cases such as for European/ Other women, and Māori women in a few DHBs). Trend charts for ethnicity can be seen in Figure 76 and Figure 77.

As in previous reports, the proportion of women with histological follow-up varies 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 six of the ten age groups at 90 days follow-up, and in five age groups at 180 days. Decreases were seen in the five-year age groups between 20-29, 50-54 and 65-69 years at 90 days, and 20-29, 45-54 and 65-69 years at 180 days.

Women with no follow-up tests

The proportion of women with no record of a follow-up test has decreased when compared to the previous report at 90 days (from 9.5% to 8.5% in the current report), and has remained similar at 180 days (from 5.2% to 5.7%).

Trends by DHB were complex, but the proportion of women with no follow-up test recorded at 180 days reduced in eight of the 20 DHBs, and the reductions were greatest in Tairawhiti, Southern and West Coast. Increases were observed in the remaining 12 DHBs and was largest in South Canterbury.

In the current monitoring period, the proportion of women for whom there was no follow-up test recorded has increased for Pacific women at 90 days (by 5.2%, from 12.2% to 17.4%) and at 180 days (by 3.8%, from 6.7% to 10.5%). For Māori women, there was a decrease from 17.8% to 13.3% at 90 days, but an increase was observed at 180 days from 8.6% to 9.5%. For Asian women, the rate was fairly constant from 9.2% to 9.4% at 90 days, but increased from 5.6% to 7.1% at 180 days. For European/ Other women the percent of women with

no follow-up decreased from 7.6% to 6.6% at 90 days, and from 4.4% to 4.3% at 180 days.

Comments

The proportion of women with a follow-up test of any kind provides useful additional information. While 17.0% of women with high-grade cytology reports had no record of a histology report within 90 days, the proportion without a record of a follow-up test of any kind was much lower (8.5%). The same was also true at 180 days, where 11.7% 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 (5.7%). Consistent with previous monitoring reports, many of the women with no follow-up histology recorded do have a record of some follow-up test. This provides reassurance that many women without histology have not been lost to follow-up.

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

Note that some women presenting with cancer may be referred directly to oncology and therefore not be recorded on the NCSP Register. This may have contributed to the lower rates of follow-up recorded for women with an urgent referral, due to a suspicion of invasive disease.

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

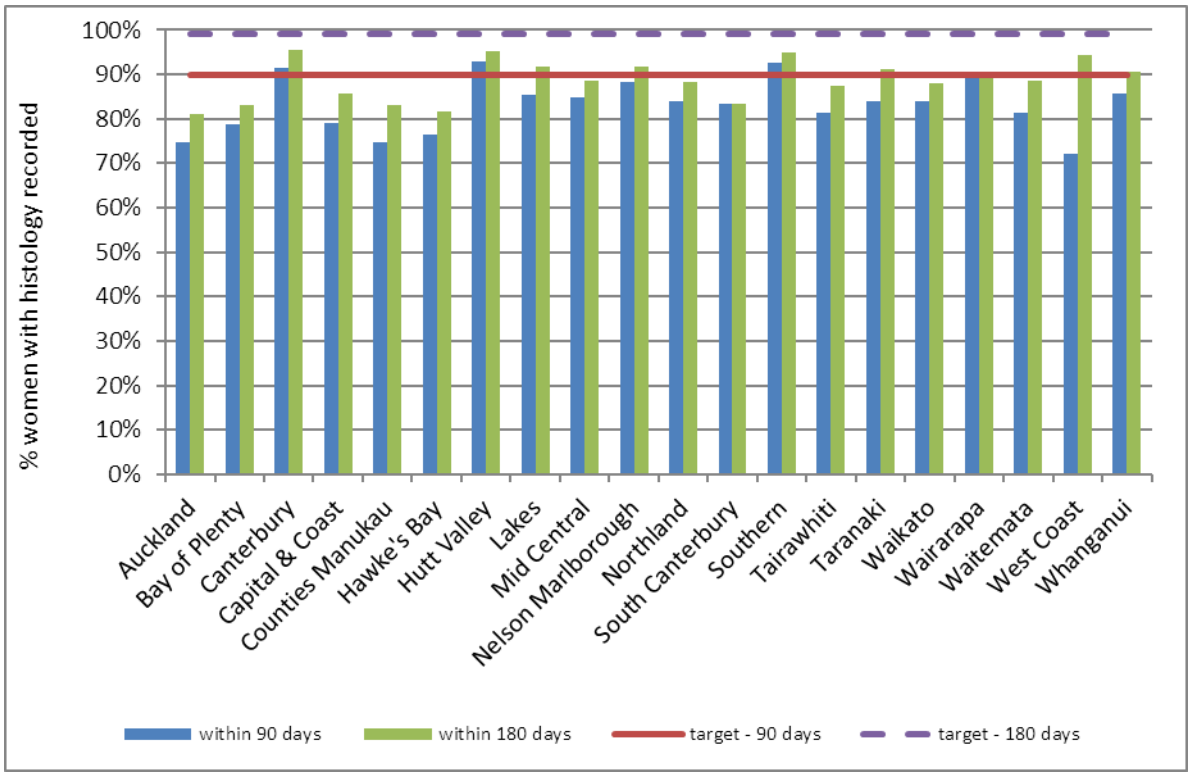
The risk level for women with no recorded biopsy is difficult to ascertain because a lack of histology can be due to a number of reasons, including:

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

Risk is also related to the degree of abnormality including microinvasive/ invasive carcinoma. Women who do not or refuse to attend are at highest risk

due to no colposcopic examination. Due to the significant risk for this group of women if not followed up, NCSP Portfolio Managers ensure that priority is given to follow-up of these women through DHBs.

Figure 71 - Proportion of women with a histology report within 90 days, and within 180 days of their high-grade cytology report, by DHB



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

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

DHB	High-grade cytology	Follow-up histology within 90 days		Follow-up histology within 180 days	
	N	N	%	N	%
Auckland	189	141	74.6	153	81.0
Bay of Plenty	71	56	78.9	59	83.1
Canterbury	220	201	91.4	210	95.5
Capital & Coast	105	83	79.0	90	85.7
Counties Manukau	166	124	74.7	138	83.1
Hawke's Bay	76	58	76.3	62	81.6
Hutt Valley	43	40	93.0	41	95.3
Lakes	48	41	85.4	44	91.7
Mid Central	79	67	84.8	70	88.6
Nelson Marlborough	60	53	88.3	55	91.7
Northland	69	58	84.1	61	88.4
South Canterbury	24	20	83.3	20	83.3
Southern	136	126	92.6	129	94.9
Tairawhiti	32	26	81.3	28	87.5
Taranaki	56	47	83.9	51	91.1
Waikato	150	126	84.0	132	88.0
Wairarapa	19	17	89.5	17	89.5
Waitemata	167	136	81.4	148	88.6
West Coast	18	13	72.2	17	94.4
Whanganui	21	18	85.7	19	90.5
Total	**1,749**	**1,451**	**83.0**	**1,544**	**88.3**

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

Age (years)	High-grade cytology	Follow-Up histology Within 90 days		Follow-up histology Within 180 days	
	N	N	%	N	%
<20	4	4	100.0	4	100.0
20-24	276	237	85.9	245	88.8
25-29	389	328	84.3	345	88.7
30-34	294	261	88.8	277	94.2
35-39	196	175	89.3	181	92.3
40-44	111	101	91.0	107	96.4
45-49	115	99	86.1	103	89.6
50-54	119	81	68.1	85	71.4
55-59	99	68	68.7	81	81.8
60-64	58	46	79.3	50	86.2
65-69	55	34	61.8	44	80.0
70+	33	17	51.5	22	66.7
Total	**1,749**	**1,451**	**83.0**	**1,544**	**88.3**

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

	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	10	58.8	8	50.0	34	73.9	89	80.9
Bay of Plenty	10	71.4	2	100.0	2	66.7	42	80.8
Canterbury	22	91.7	3	50.0	12	80.0	164	93.7
Capital & Coast	7	77.8	0	0.0	5	55.6	71	83.5
Counties Manukau	23	62.2	24	75.0	24	82.8	53	77.9
Hawke's Bay	25	89.3	1	50.0	0	0.0	32	72.7
Hutt Valley	8	100.0	3	100.0	4	100.0	25	89.3
Lakes	14	87.5	0	0.0	0	0.0	27	90.0
Mid Central	16	84.2	1	100.0	5	62.5	45	88.2
Nelson Marlborough	6	100.0	2	100.0	1	50.0	44	88.0
Northland	18	81.8	2	100.0	0	0.0	38	86.4
South Canterbury	2	100.0	-	-	-	-	18	81.8
Southern	7	87.5	2	100.0	5	83.3	112	93.3
Tairawhiti	19	82.6	0	0.0	1	100.0	6	85.7
Taranaki	8	80.0	2	100.0	1	100.0	36	83.7
Waikato	21	75.0	4	80.0	8	80.0	93	86.9
Wairarapa	2	100.0	1	100.0	-	-	14	87.5
Waitemata	8	66.7	4	66.7	30	93.8	94	80.3
West Coast	1	100.0	-	-	-	-	12	70.6
Whanganui	5	62.5	-	-	-	-	13	100.0
Total	**232**	**78.9**	**59**	**68.6**	**132**	**77.6**	**1,028**	**85.7**

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

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

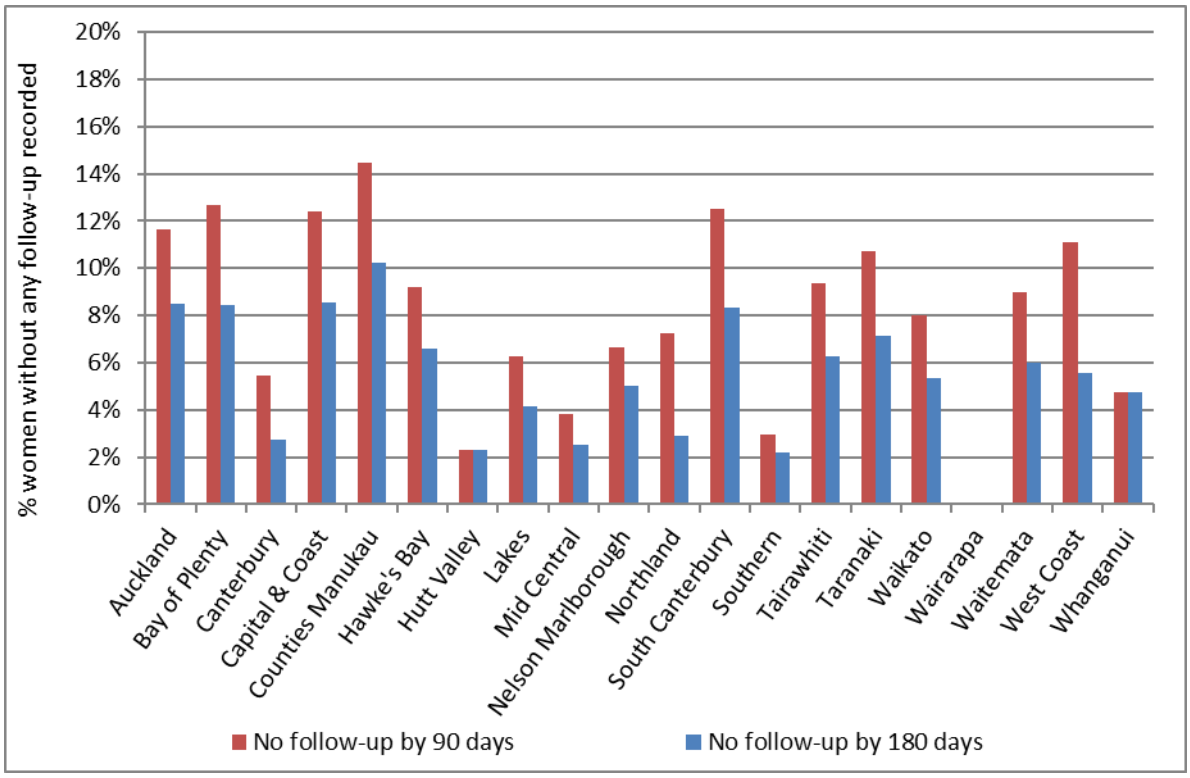
	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	13	76.5	9	56.3	37	80.4	94	85.5
Bay of Plenty	11	78.6	2	100.0	2	66.7	44	84.6
Canterbury	24	100.0	5	83.3	13	86.7	168	96.0
Capital & Coast	7	77.8	0	0.0	6	66.7	77	90.6
Counties Manukau	28	75.7	27	84.4	26	89.7	57	83.8
Hawke's Bay	26	92.9	1	50.0	1	50.0	34	77.3
Hutt Valley	8	100.0	3	100.0	4	100.0	26	92.9
Lakes	14	87.5	0	0.0	1	100.0	29	96.7
Mid Central	18	94.7	1	100.0	6	75.0	45	88.2
Nelson Marlborough	6	100.0	2	100.0	1	50.0	46	92.0
Northland	19	86.4	2	100.0	0	0.0	40	90.9
South Canterbury	2	100.0	-	-	-	-	18	81.8
Southern	8	100.0	2	100.0	5	83.3	114	95.0
Tairawhiti	21	91.3	0	0.0	1	100.0	6	85.7
Taranaki	9	90.0	2	100.0	1	100.0	39	90.7
Waikato	22	78.6	4	80.0	8	80.0	98	91.6
Wairarapa	2	100.0	1	100.0	-	-	14	87.5
Waitemata	8	66.7	5	83.3	31	96.9	104	88.9
West Coast	1	100.0	-	-	-	-	16	94.1
Whanganui	6	75.0	-	-	-	-	13	100.0
Total	**253**	**86.1**	**66**	**76.7**	**143**	**84.1**	**1,082**	**90.2**

'– ' 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	61	83.6	1,390	82.9
- any follow-up	64	87.7	1,536	91.6
- no follow-up	*9*	*12.3*	*140*	*8.4*
Follow-up within 180 days				
- histology	63	86.3	1,481	88.4
- any follow-up	65	89.0	1,584	94.5
- no follow-up	*8*	*11.0*	*92*	*5.5*

Figure 72 - Proportion of women without any follow-up test within 90 days and within 180 days of a high-grade cytology report, by DHB



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

Figure 73 - Proportion of women without any follow-up test within 90 days and within 180 days of a high-grade cytology report, by ethnicity

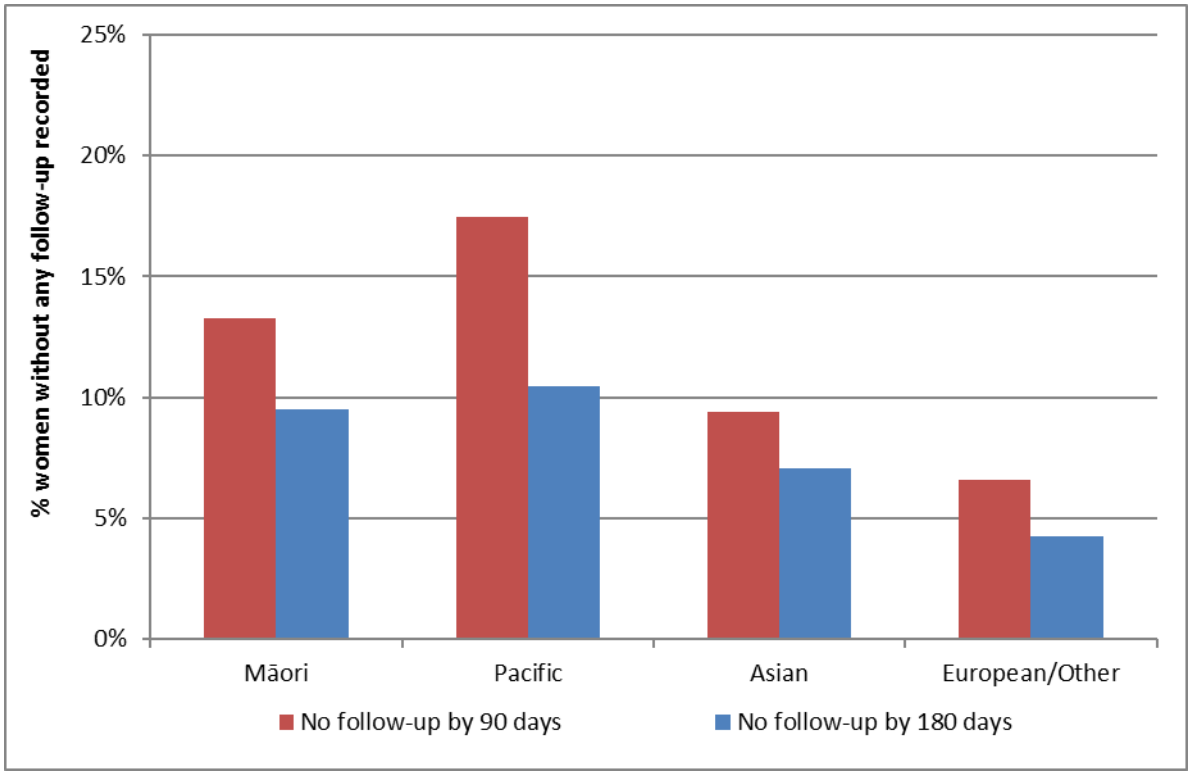


Table 17 - Women without any follow-up test within 90 and 180 days of a high-grade cytology report, by DHB

DHB	High-grade cytology N	Without a follow-up test by 90 days N	%	Without a follow-up test by 180 days N	%
Auckland	189	22	11.6	16	8.5
Bay of Plenty	71	9	12.7	6	8.5
Canterbury	220	12	5.5	6	2.7
Capital & Coast	105	13	12.4	9	8.6
Counties Manukau	166	24	14.5	17	10.2
Hawke's Bay	76	7	9.2	5	6.6
Hutt Valley	43	1	2.3	1	2.3
Lakes	48	3	6.3	2	4.2
Mid Central	79	3	3.8	2	2.5
Nelson Marlborough	60	4	6.7	3	5.0
Northland	69	5	7.2	2	2.9
South Canterbury	24	3	12.5	2	8.3
Southern	136	4	2.9	3	2.2
Tairawhiti	32	3	9.4	2	6.3
Taranaki	56	6	10.7	4	7.1
Waikato	150	12	8.0	8	5.3
Wairarapa	19	-	-	-	0.0
Waitemata	167	15	9.0	10	6.0
West Coast	18	2	11.1	1	5.6
Whanganui	21	1	4.8	1	4.8
Unspecified	-	-		-	
Total	**1,749**	**149**	**8.5**	**100**	**5.7**

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

Ethnicity	High-grade cytology N	Without follow-up by 90 days N	%	Without follow-up by 180 days N	%
Māori	294	39	13.3	28	9.5
Pacific	86	15	17.4	9	10.5
Asian	170	16	9.4	12	7.1
European/ Other	1,199	79	6.6	51	4.3
Total	**1,749**	**149**	**8.5**	**100**	**5.7**

Figure 74 – Trends in the proportion of women with high-grade cytology who have follow-up within 90 days recorded on the NCSP Register, by DHB

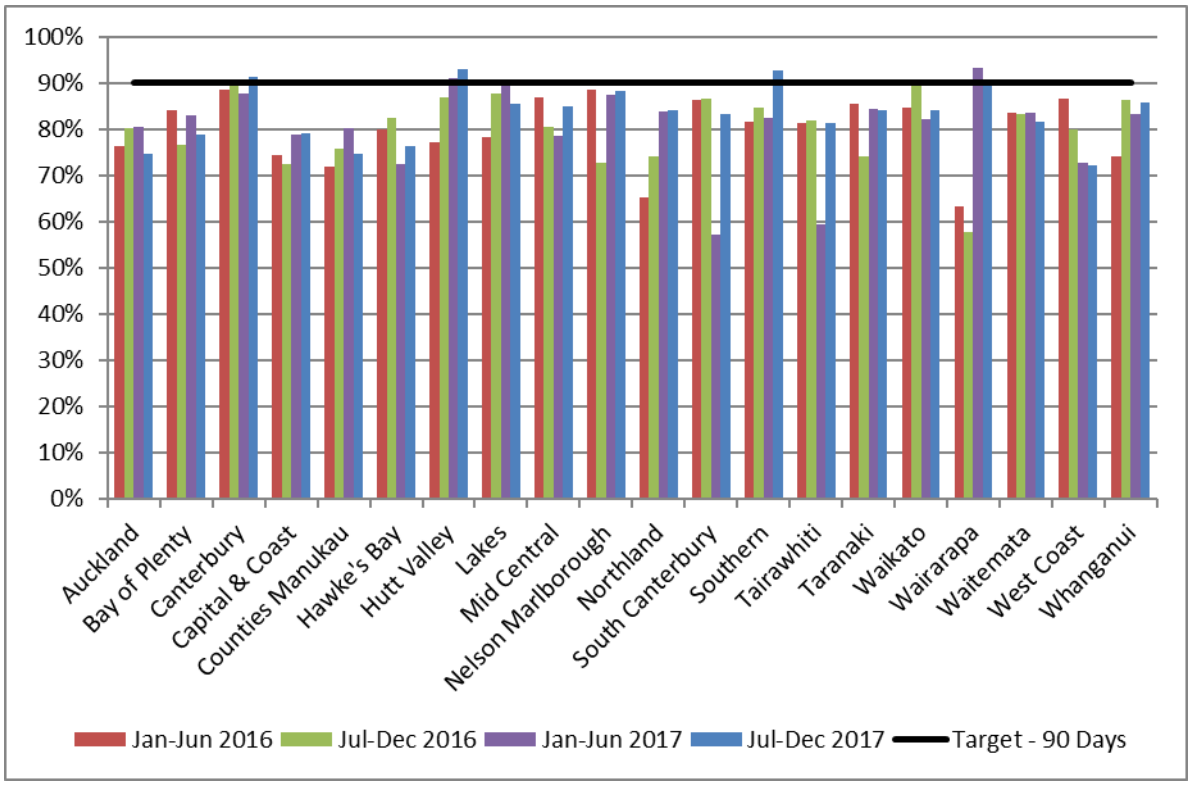


Figure 75 – Trends in the proportion of women with high-grade cytology who have follow-up within 180 days recorded on the NCSP Register, by DHB

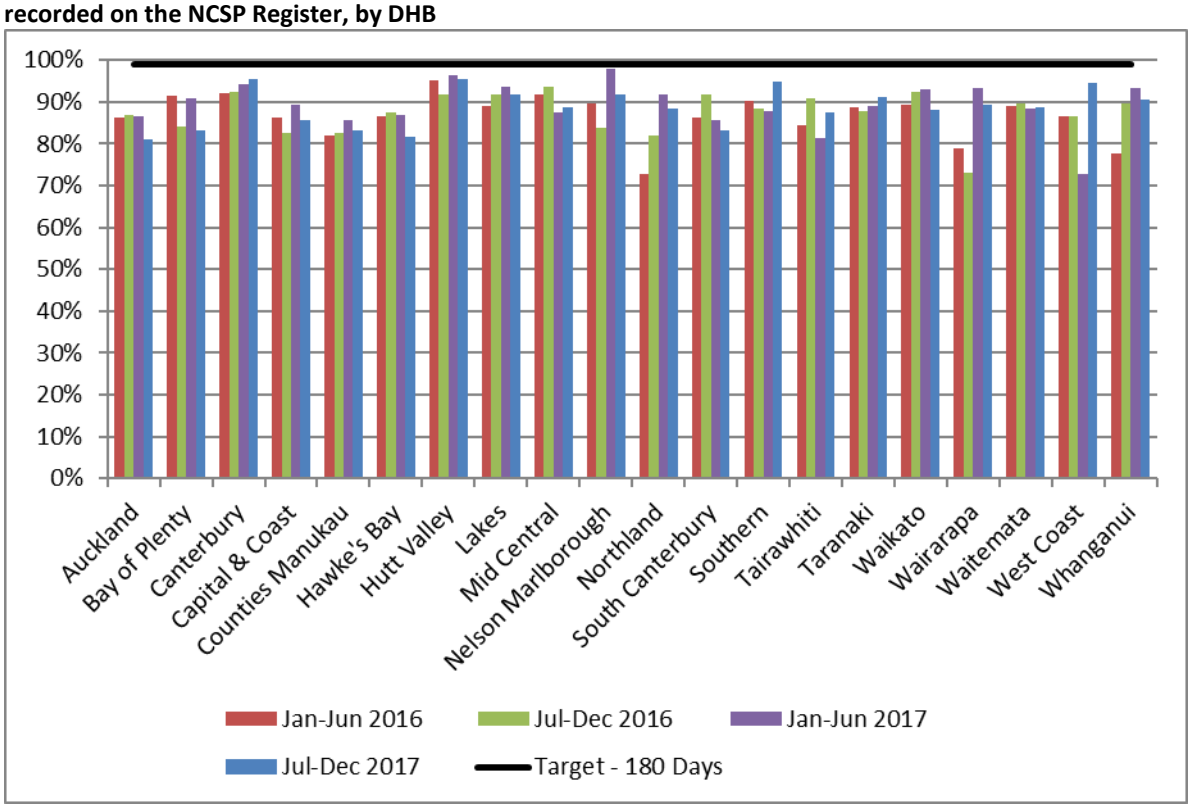


Figure 76 - Trends in the proportion of women with high-grade cytology who have follow-up within 90 days recorded on the NCSP Register, by ethnicity

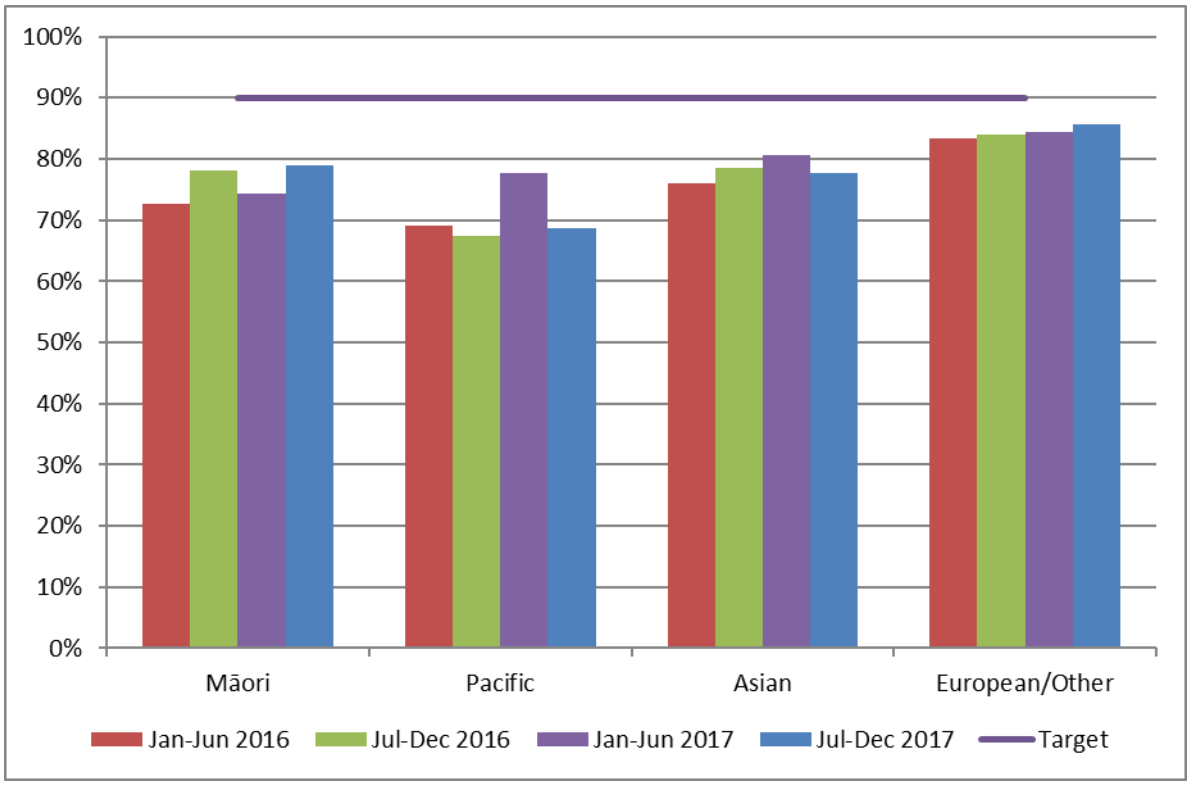
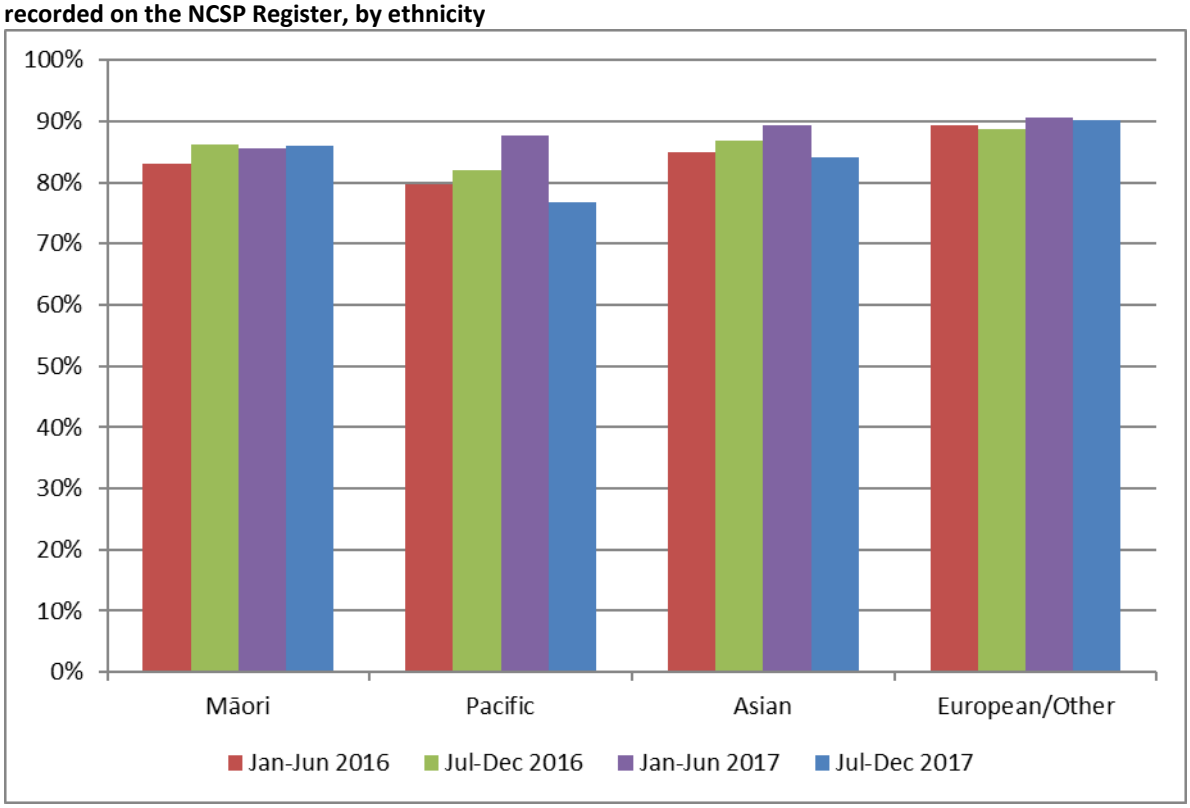


Figure 77 - Trends in the proportion of women with high-grade cytology who have follow-up within 180 days recorded on the NCSP Register, by ethnicity



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.[14] 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. [15]

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 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.

One of the data items required to report against Standard 602 (appointment date) is a new data item required by the Colposcopy Policies and Standards 2013. It is not yet available from all DHBs, however, because although all have transitioned to reporting using 2013 Standards this field cannot be fully utilised due to a lack of completeness over the period required to report on this indicator in the current report. Therefore, this indicator relies on a proxy, the colposcopy visit date, and is not yet directly comparable to the standard. This approach was taken in agreement with the Ministry and NCSP Advisory Group. Timeliness is calculated using the time from the referral following the high-grade cytology result being accepted by the colposcopy unit, to the time of the woman's first colposcopic assessment at that colposcopy unit.

As in Indicator 6, high-grade cytology results are included if the cytology sample was collected in the six months preceding the current monitoring period (i.e. 1 January - 30 June 2017). High-grade cytology is defined as that associated with any of the TBS codes ASH, HS1, HS2, SC, AG1-AG5, AIS, AC1-AC5. Where a woman has more than one high-grade cytology result in the relevant time period, the result from the first high-grade cytology sample collected is used. Timeliness of colposcopic assessment is calculated separately for those women with clinical suspicion of invasive carcinoma, or a suspicion of invasive carcinoma (based on either cytological interpretation TBS codes HS2, SC, AC1-AC5 or recommendation codes R10 or R14 that may be used in the context of symptoms); and for women with other high-grade cytology results (TBS codes ASH, HS1, AG1-AG5, AIS), since the timeframes differ for these two groups.

Referrals and colposcopy visits for these women were retrieved from the NCSP Register. The standard requires that a woman be seen within a time period from when the colposcopy unit received the referral. However due to the completeness of the accepted referral date compared to the received date, referral accepted date is used in this indicator as a proxy for the date the referral was received, and the start date for calculating timeliness. Referrals were retrieved where the date on which the referral was accepted occurred after the date the cytology sample was collected, and the referral was accepted no later than four weeks prior to the end of the current monitoring period. Colposcopy visits recorded on the NCSP Register were retrieved if they occurred after an accepted referral (to the same DHB) and no later than the end of the current monitoring period. The difference of four weeks between the two was to ensure that there were at least four weeks of data following every accepted referral which could be searched for colposcopy visits. In the current report, histology data are also used to supplement colposcopy data and help ascertain if a colposcopy visit occurred. Women with a histology sample collected after their cytology sample are assumed to have attended a

colposcopy clinic for follow-up on the date the histology sample was collected, even if a colposcopy visit is not explicitly recorded on the NCSP Register.

Histology results have been used by the NCSP Register to follow up missing colposcopy visit data to improve the quality of colposcopy data on the Register. During the previous and current monitoring periods all DHBs adopted electronic reporting of the 2013 Standards, with the last three DHBs going live in August 2016. This has greatly improved the data on the Register and for public DHBs and future reports will be able to report directly against the 2013 Standards without using the current proxies for DHBs (with limited exceptions). Whereas, for private clinics complete reporting against the 2013 Standards is taking more time with the majority still reporting against 2008 standards. Therefore, values reported for the private aggregate will need to continue to use histology proxies (where necessary) until all private data is in accordance with the 2013 Standards.

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

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

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

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

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

Target	***Timeliness – high-grade cytology indicating suspicion of invasive disease***

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

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

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

Current Situation

In the period 1 January - 30 June 2017, there were 1,749 women with high-grade cytology results who were not already under specialist management. There were 73 women who had results indicating suspicion of invasive disease, and the remaining 1,676 had other high-grade cytology results. In total, accepted referrals were found for 1,542 (88.2%) of the 1,749 women (Table 59).

Timeliness – high-grade cytology indicating suspicion of invasive disease
Accepted referrals for colposcopy were found for 40 (54.8%) of the 73 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 62. Of these 40 women with a referral, 26 (65.0%) have a record of a colposcopy visit on the NCSP Register within ten working days of their referral, and 33 (82.5%) have a visit within 20 working days (Table 19).

Considering all 73 women with high-grade cytology indicating suspicion of invasive disease, regardless of whether or not a referral to colposcopy was recorded, a total of 64 (87.7%) have a record of a colposcopy visit prior to 31 December 2017 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 1,502 women (89.6%) of the 1,676 women who had high-grade cytology not indicating suspicion of invasive disease. Among the women with accepted referrals, 1,135 (75.6%) were seen at colposcopy within 20 working days of their referral, and 1,365 (90.9%) were seen within 40 working days (Table 60). The proportion of women seen within

	20 working days varied by ethnicity, from 67.6% (Pacific women) to 78.0% (Asian women) (Figure 78, Table 60). This proportion also varied by DHB from 33.3% (West Coast) to 95.0% (Whanganui) (Figure 79, Table 61). In total, 1,579 (94.2%) of the 1,676 women with high-grade cytology (but no suspicion of invasive disease) relating to a sample collected in the period 1 January - 30 June 2017 have a record of a colposcopy visit prior to 31 December 2017 (representing a follow-up period of at least six and up to 12 months after their high-grade cytology).
Trends	Nationally, the proportion of women with high-grade cytology indicating suspicion of invasive disease and an accepted colposcopy referral who were seen within the target timeframe (10 working days) has decreased from 90.0% to 65.0%. 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 (82.5%) is also lower than the previous report (92.5%). The proportion of women with high-grade cytology (but no suspicion of invasive disease) and an accepted colposcopy referral who were seen within 20 working days has increased from 69.6% in the previous report to 75.6% in the current report. This trend was also representative when investigated by ethnicity, with an increase in all ethnic groups in this monitoring period in the proportion of women with high-grade cytology and no suspicion of invasive disease seen within 20 working days (Figure 80). The proportion of all women with high-grade results for whom an accepted referral was available on the NCSP Register is similar in the current report compared to the previous report (88.2% in the current report; 88.0% in Report 47).
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 (late February 2018 for the current report) would lead to an underestimate of the number of women with referrals and/or follow-up colposcopy visits. In order to help address this, in the current report, histology data are also used to help ascertain if a colposcopy visit occurred. Women with a histology sample collected after their cytology sample are assumed to have attended a colposcopy clinic for follow-up, even if a colposcopy visit is not explicitly recorded on the NCSP Register. Among the 1,643 women (with or without a referral) who had a colposcopy visit by the end of the current monitoring period, there were 149 (9.1%) 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.

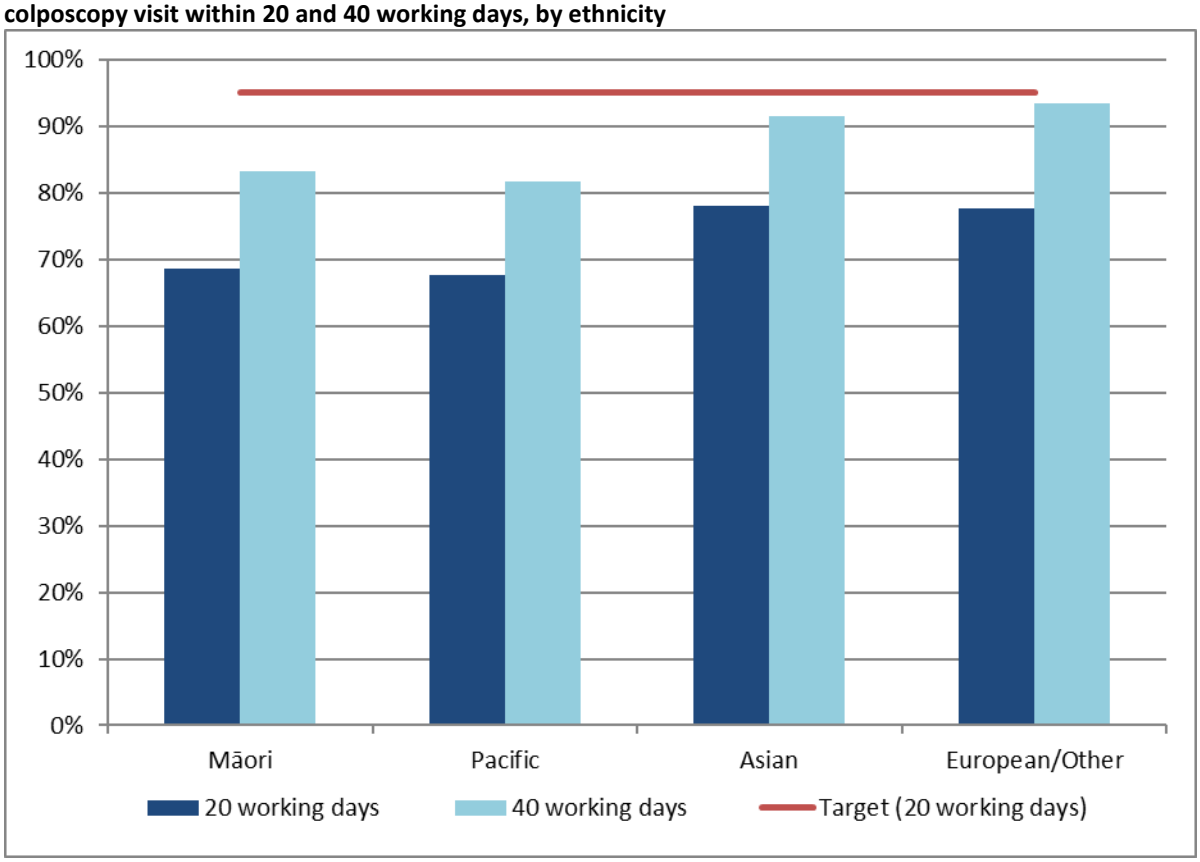
Additional information about follow-up tests performed in women with high-grade cytology is included in Indicator 6. The same 1,749 women (73 with suspicion of invasive disease, 1,676 with other high-grade cytology) are included in both this measure and Indicator 6. In Indicator 6, it was found that 1,544 (88.3%) had histology within 180 days and 1,649 (94.3%) had a follow-up test of some sort within 180 days. While in this indicator, colposcopy and histology records indicate that 1,643 (93.9%) women had attended colposcopy prior to 31 December 2017 (i.e. in a period of at least 181 days and up to one year after their high-grade cytology sample). Note that there may be some differences in results by DHB, however, since in Indicator 6 the DHB assigned to a woman is her own DHB (or, where this information is not available on the NCSP Register, the DHB of her responsible health facility, based on the clinic's geographic location). In this indicator, women are assigned to a DHB based on either the DHB where they attended colposcopy, or the most recent DHB to which they have been referred (for women without colposcopy visits), or to the DHB of the health facility where the high-grade cytology sample was collected (for women with no referral and no colposcopy visit). Additionally, only public clinics are assigned a DHB within Indicator 7.1; private clinics are separated out and reported on as a group.

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

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

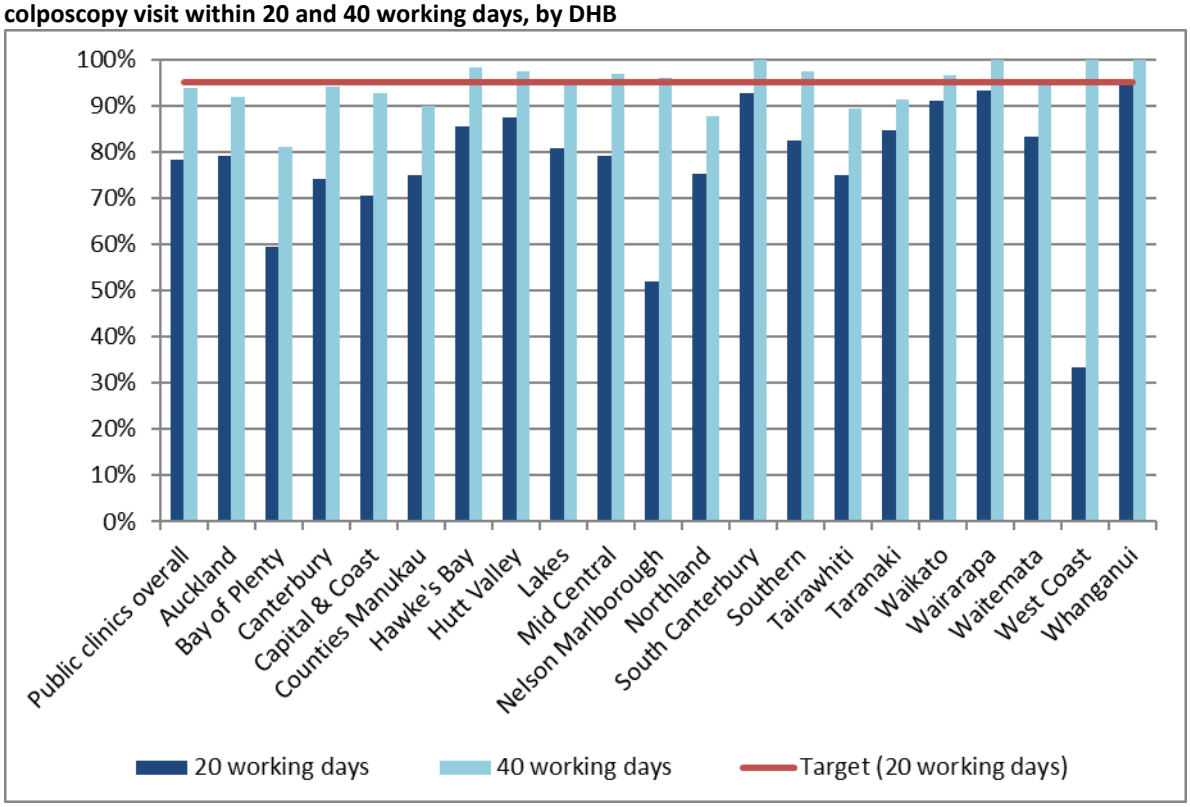
	HG women (suspicion of invasion)	Urgent referrals received	Women seen within:			
			10 working days		20 working days	
Ethnicity	**N**	**N**	**N**	**%**	**N**	**%**
Māori	13	8	5	62.5	7	87.5
Pacific	8	3	2	66.7	2	66.7
Asian	13	10	5	50.0	6	60.0
European/ Other	39	19	14	73.7	18	94.7
Total	**73**	**40**	**26**	**65.0**	**33**	**82.5**

Figure 78 - 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



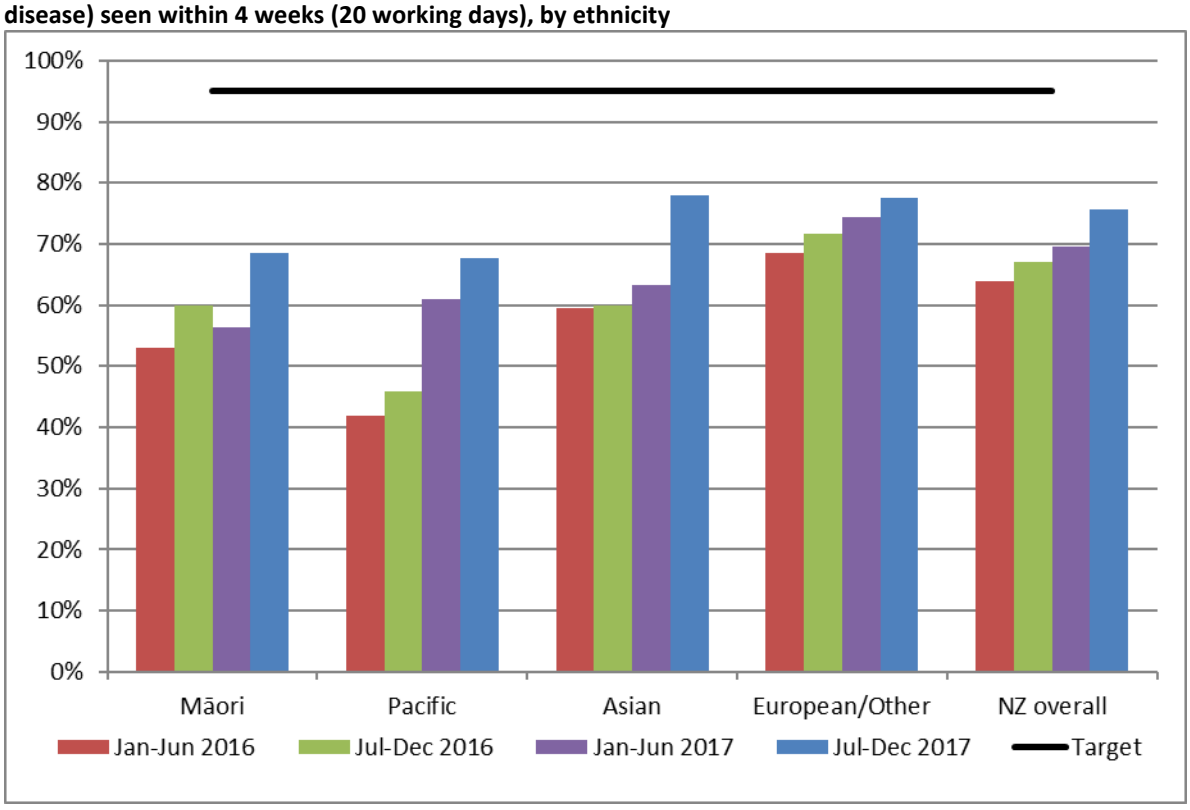
95% target relates to colposcopy visits within 20 working days

Figure 79 - 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 80 – 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.

One of the data items required to report against Standard 602 (appointment date) is a new data item required by the Colposcopy Policies and Standards 2013. Although all DHBs have transitioned to reporting using 2013 Standards, this field cannot be fully utilised due to a lack of completeness. In addition, this indicator considers colposcopy data from visits that occurred earlier than the current monitoring period. Therefore, because appointment date is not yet available to use, this indicator relies on a proxy, the colposcopy visit date, and is not directly comparable to the Standard. This approach was taken in agreement with the Ministry and NCSP Advisory Group.

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 2016 for the current report) where the results were low-grade (ASC-US or LSIL), and either a positive hrHPV test (within four weeks of the cytology result) or a previous low-grade cytology result (within the previous five years). Women undergoing test-of-cure management for a recent treatment of a high-grade squamous lesion (within the previous 4 years) were excluded.

Referrals and colposcopy visits for these women were retrieved from the NCSP Register. Referrals were retrieved where the date on which the referral was accepted occurred after the date the cytology sample was collected, and at least 26 weeks before the end of the current monitoring period (i.e. 26 weeks before 31 December 2017, 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.

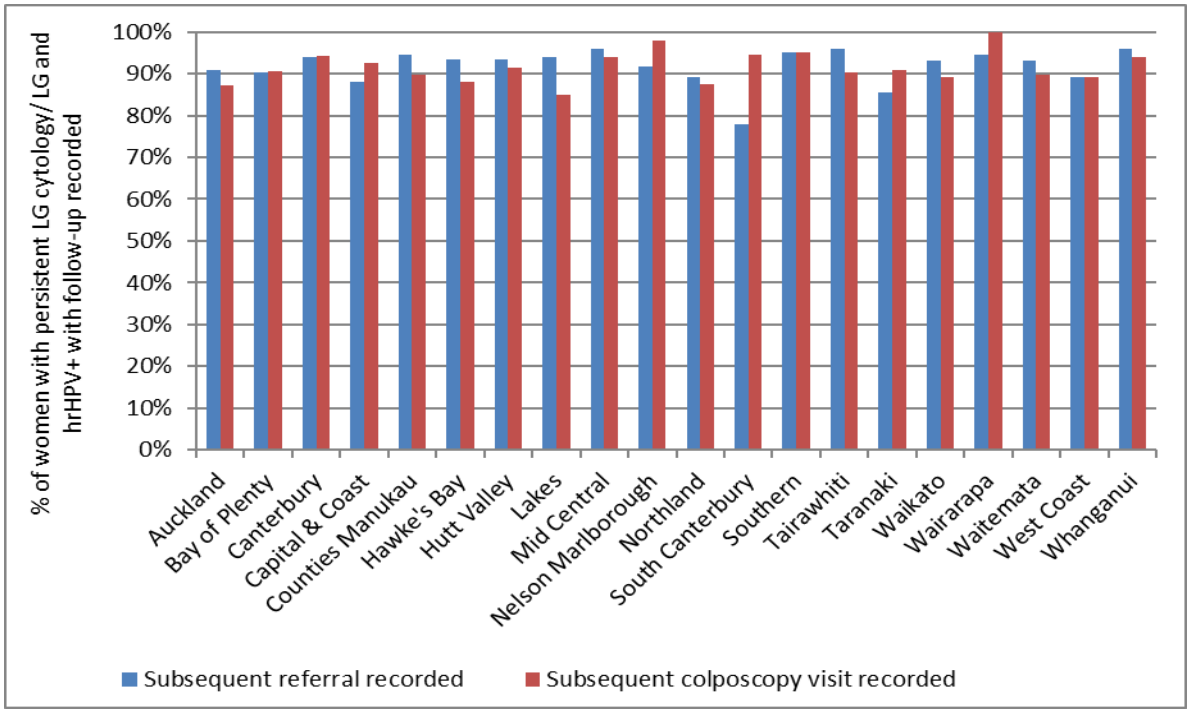
Results are reported by ethnicity and DHB. DHB is assigned in the same way as in Indicator 7.1. For women who attended colposcopy, DHB is assigned on the basis of the DHB of the colposcopy facility where they attended for colposcopy (or where the histology sample was collected if a visit is not explicitly 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 3,523 women with either persistent low-grade cytology or low-grade cytology and a positive hrHPV test collected in the period 1 July – 31 December 2016. Nationally, subsequent accepted referrals are recorded for 2,990 (84.9%) of these women, and subsequent colposcopy for 3,207 (91.0%). The proportion of women for whom a subsequent referral and colposcopy visit are recorded are shown by DHB in Figure 81, and by ethnicity in Figure 82. The proportion of women for whom an accepted referral was recorded on the NCSP Register ranged from 77.8% (South Canterbury) to 96.1% (Tairawhiti; Figure 81). 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 84.8% (Lakes) to all women (Wairarapa; Figure 81). For ethnicity, the proportion of women for whom an accepted referral was recorded on the NCSP Register ranged from 82.8% for European/ Other women to 93.6% for Māori women (Figure 82). 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 86.6% (Māori women) to 92.1% (European/ Other women) (Figure 82). 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 2,990 women with an accepted referral nationally, 2,543 (85.1%) women attended for colposcopy within 26 weeks of their accepted referral (Table 63). By DHB, the proportion of women who attended for colposcopy within 26 weeks of their accepted referral ranged from 58.6% (Hawke's Bay) to all women (Wairarapa) (Figure 83,

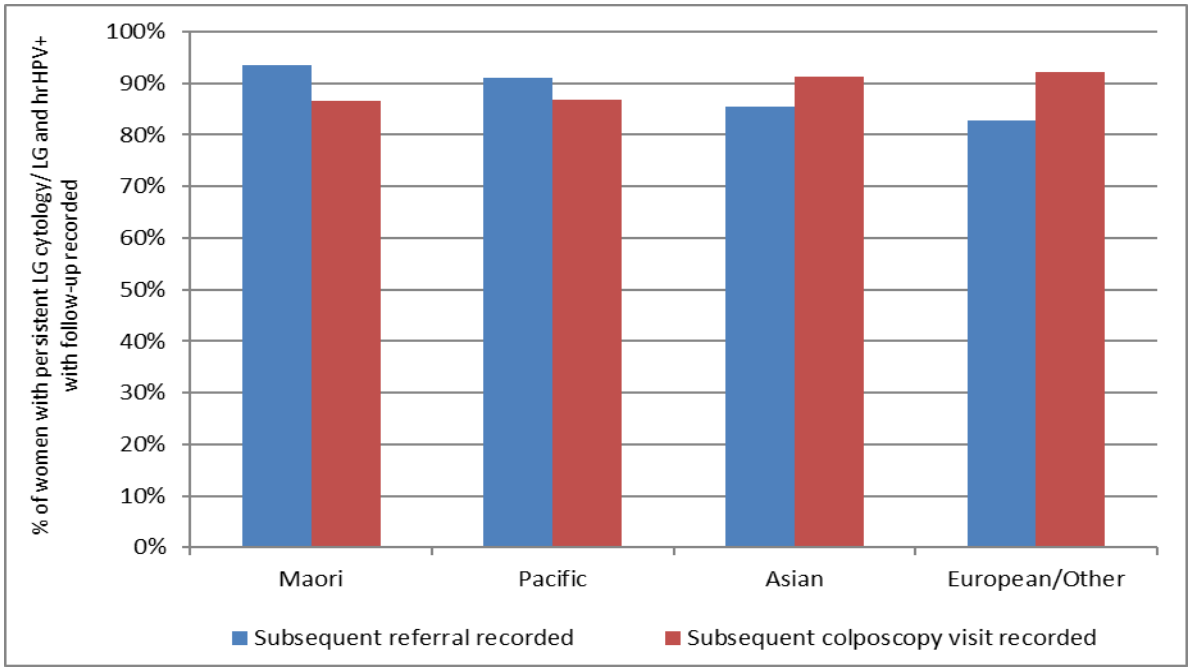
	Table 63). By ethnicity, this figure ranged from 73.9% of Māori women attending for colposcopy within 26 weeks of their accepted referral, to 88.9% of Asian women (Figure 84, Table 64) Overall 2,806 women attended colposcopy following an accepted referral on the NCSP Register, and by the end of the current monitoring period (a follow-up period of 12 - 18 months after their cytology sample). This is equivalent to 79.6% of all women with persistent low-grade cytology or low-grade cytology and a positive hrHPV test, and 93.8% of women who had an accepted referral following their low-grade cytology.
Trends	Nationally, the proportion of women with colposcopy within 26 weeks of being referred has increased (85.1% in the current report, compared to 81.4% in the previous report), and it has also increased in every ethnic group with a maximum increase of 14.0 percentage points in Pacific women (Figure 85). The proportion of women seen within 26 weeks has increased since the previous report in eight out of 20 DHBs (Figure 86). A substantial decrease (greater than 10 percentage points) in the proportion seen within 26 weeks was observed in one DHB (Hawke's Bay). Conversely, a substantial increase (greater than 10 percentage points) in the proportion of women with colposcopy within 26 weeks compared to the previous report was seen in three DHBs (Counties Manukau, South Canterbury and Waikato).
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 (late February 2018 for the current report) would lead to an underestimate of the number of women with referrals and/ or follow-up colposcopy visits. In order to help address this, in the current report, histology data are also used to help ascertain if a colposcopy visit occurred. Women with a histology sample collected after their cytology sample are assumed to have attended a colposcopy clinic for follow-up, even if a colposcopy visit is not explicitly recorded on the NCSP Register. As has been the case for previous monitoring periods, it is evident that referrals are incompletely recorded on the NCSP Register, as some women have a record of a colposcopy visit, but no record of an accepted referral.

Figure 81 - 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 82 - 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 83 - 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

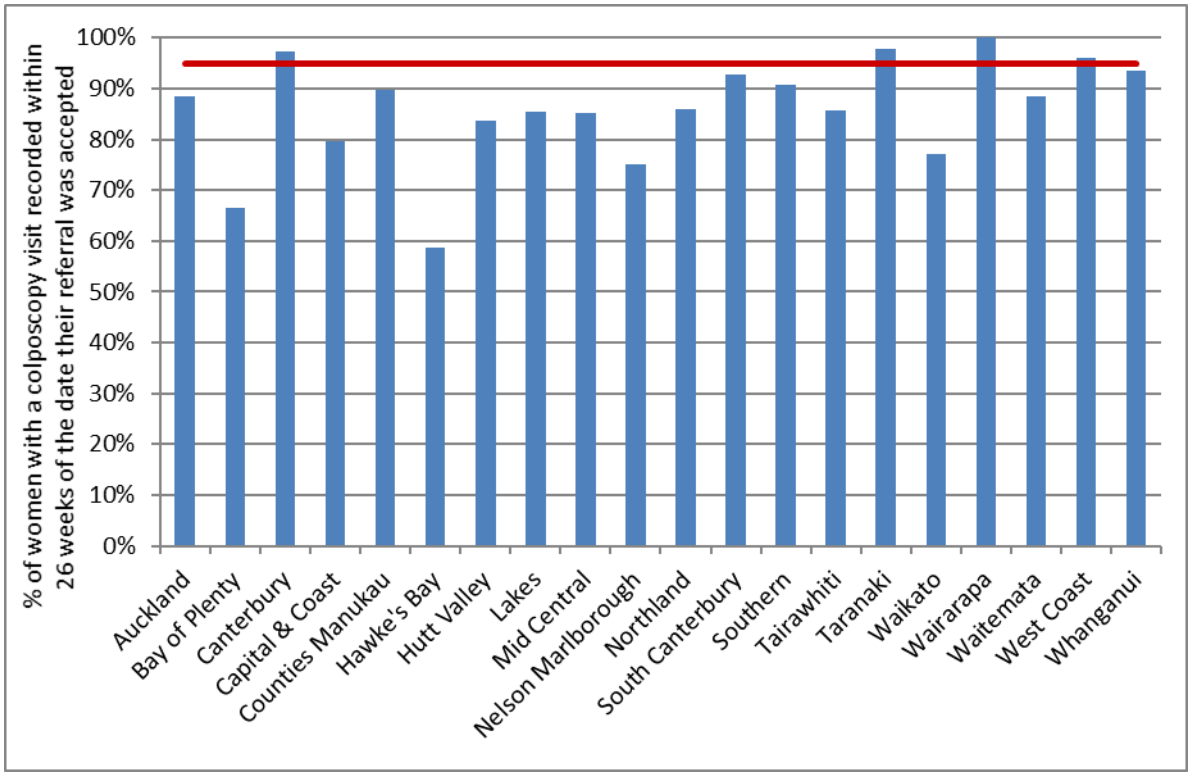


Figure 84 - Women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy: percentage with a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by ethnicity

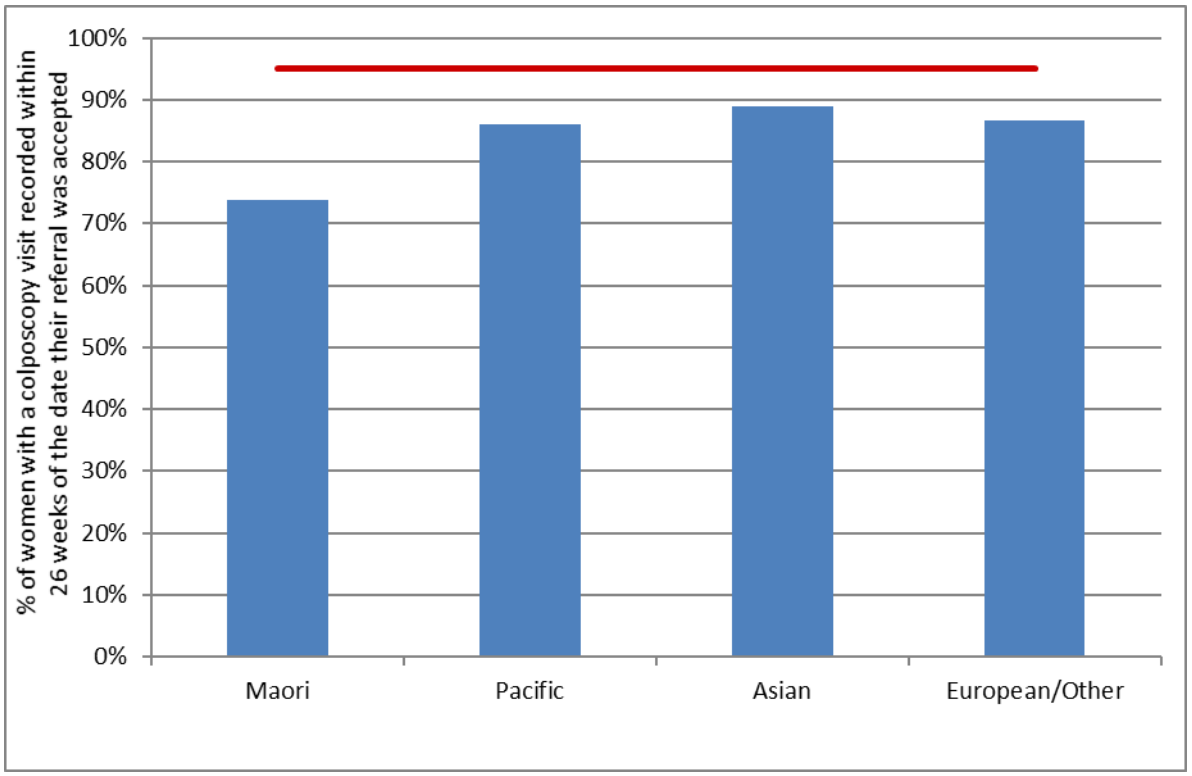


Figure 85 - Trends in the proportion of women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy who have a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by ethnicity

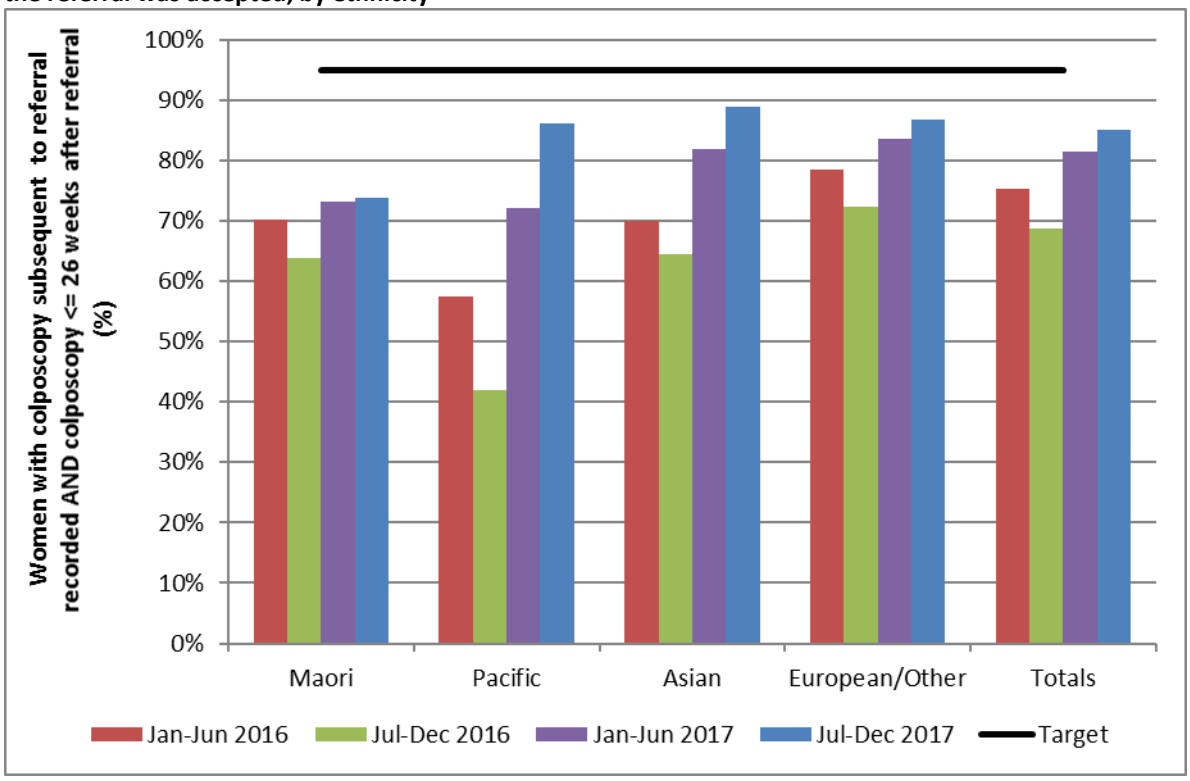
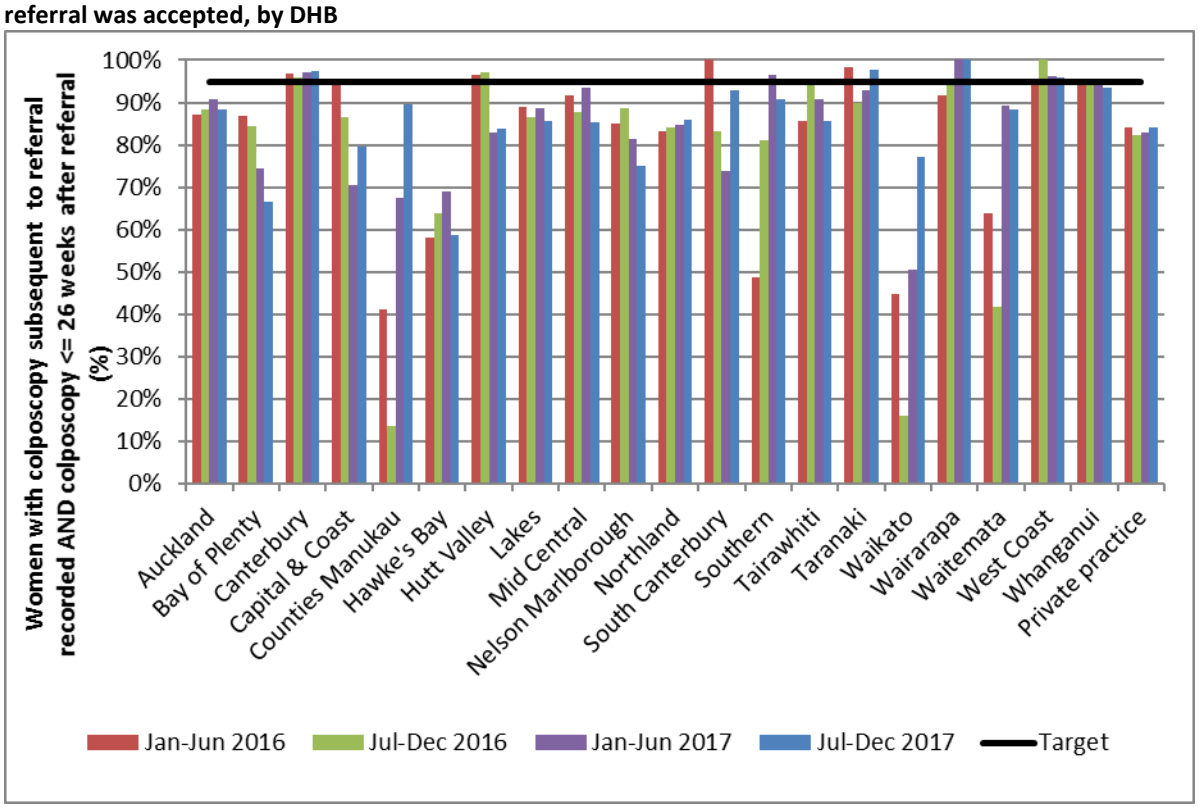


Figure 86 - Trends in proportion of women with persistent LG cytology or LG cytology and positive hrHPV test and an accepted referral for colposcopy who have a colposcopy visit recorded within 26 weeks of the date the referral was accepted, by DHB



Indicator 7.3 – Adequacy of documenting colposcopy assessment

Definition

This indicator measures performance against Standard 603.

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

i) visibility of the squamo-columnar junction
ii) presence or absence of a visible lesion
iii) colposcopic opinion regarding the nature of the abnormality
iv) recommended management and follow-up
v) timeframe recommended for follow-up
vi) items i), ii), and iii) completed

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

Target

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

i) visibility of the squamo-columnar junction
ii) presence or absence of a visible lesion
iii) visibility of the limits of lesion
iv) colposcopic opinion regarding the nature of the abnormality and the requirement for treatment
v) recommended management and follow-up
vi) timeframe recommended for follow-up.

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

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

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

Current Situation

There were 12,117 colposcopy visits within the current monitoring period recorded on the NCSP Register. Documentation relating to these visits was analysed (Table 65).

Nationally, the visibility of the squamo-columnar junction was documented for 96.9% of visits; the presence or absence of a lesion was documented for all visits; and an opinion regarding the lesion grade was documented for 91.6% of visits where the presence of a lesion could not be ruled out. Additionally, the type of follow-up was documented for 95.1% of visits and the timeframe for follow-up was documented for 94.3% 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 92.2% of visits.

The colposcopic appearance was reported to be abnormal in 54.4% of colposcopies, and inconclusive in 5.0% of colposcopies (Table 66). Biopsies were taken at 92.1% of colposcopies when the colposcopic appearance was abnormal; 34.4% of colposcopies where the colposcopic appearance was reported as inconclusive, and 18.9% of colposcopies where colposcopic appearance was reported as normal (Table 67).

Documentation varied by DHB, as shown in Figure 87 and Table 65. Documentation of visibility of the squamo-columnar junction varied from 94.1% (West Coast) to 98.9% of cases in Capital & Coast and Tairawhiti. 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 here if colposcopic appearance was recorded as abnormal or inconclusive), ranged from 86.9% (Capital & Coast) to 96.5% (Hutt Valley). Recording of the recommended type of follow-up ranged from 84.0% (Waitemata) to 99.1% of cases (Nelson Marlborough and Northland) and recording of the recommended timeframe for follow-up ranged from 83.2% (Waitemata) to 99.1% (Nelson Marlborough). 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 88.2% (West Coast) to 96.4% (Hutt Valley) (Figure 88, Table 65).

Abnormal colposcopic appearance ranged from 42.6% of colposcopies (Capital & Coast) to 63.0% of colposcopies (Canterbury). Inconclusive colposcopic appearance ranged from 2.1% of colposcopies (Northland) to 7.6% of colposcopies (Southern) (Table 66). The proportion of colposcopies where a biopsy was taken also varied by DHB. This proportion ranged from 86.0% of visits in South Canterbury, up to 96.9% (Waikato) when the colposcopic appearance was abnormal, and from 4.6% (Waikato) up to 38.2% (Tairawhiti) when the colposcopic appearance was normal (Table 67).

Colposcopies performed in private practice accounted for 10.6% of all colposcopies recorded on the NCSP Register in New Zealand in the current monitoring period. The documentation rate varied according to the recorded section in private practice when compared with public clinics overall (Table 65); The proportion complete was higher in public clinics overall when compared to the private clinics overall for documenting follow-up timeframe (94.9% for public clinics; 88.9% for private practice) and follow-up type (95.4% for public clinics and 92.8% for private practice). Documentation completion rate was higher in private clinics overall than for public clinics overall for lesion grade (93.1% for private practice and 91.5% for public clinics). The completion rate for documenting the presence or absence of a lesion was 100% in both private and public clinics. Documentation completion rate was similar in private clinics and public clinics overall for the proportion of colposcopies documenting visibility of the squamo-columnar junction (96.3% for private practice vs 97.0% for public clinics overall) and with 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 (92.4% for private practice vs 92.1% for public clinics overall).

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 96.9% of colposcopies, compared with between 97.3% and 97.4% for the previous three monitoring periods. The presence or absence of a lesion was documented for all visits in both the current and previous three periods. In the current period an opinion regarding the lesion grade was documented for 91.6% of visits where the presence of a lesion could not be ruled out, compared with between 91.5% and 92.0% for the previous three monitoring periods. Recording of recommended follow-up type was documented for 95.1% of visits in the current period, which is within the range seen for the previous three periods (94.8% - 96.5%). This was also the case for recommended timeframe for follow-up, which was recorded for 94.3% of visits in the current period compared with 94.0% - 95.9% in the previous three periods.

Trends in the completion of all required fields by DHB are shown in Figure 88.

In total 59.5% of colposcopies had an associated biopsy compared to 57.8% in the previous report. Of these, biopsies were taken in 92.1% of colposcopies with an abnormal appearance in this report and 91.4% in the previous report. 18.9% of colposcopies with a normal appearance also had documentation of a biopsy taken in both this and the previous reporting periods.

Trends in the number of colposcopies recorded on the NCSP Register by DHB are shown in Figure 89. The number of colposcopies decreased in the current monitoring period in 15 of the 20 DHBs with an overall decrease in the number of colposcopies of 5.4%.

Comments

The current colposcopy standard was published in July 2013 (available at https://www.nsu.govt.nz/health-professionals/national-cervical-screening-programme/policies-and-standards). 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). The data used in this analysis was extracted from the NCSP Register in late February 2018.

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 15 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 87 - Completion of colposcopic assessment fields, by DHB

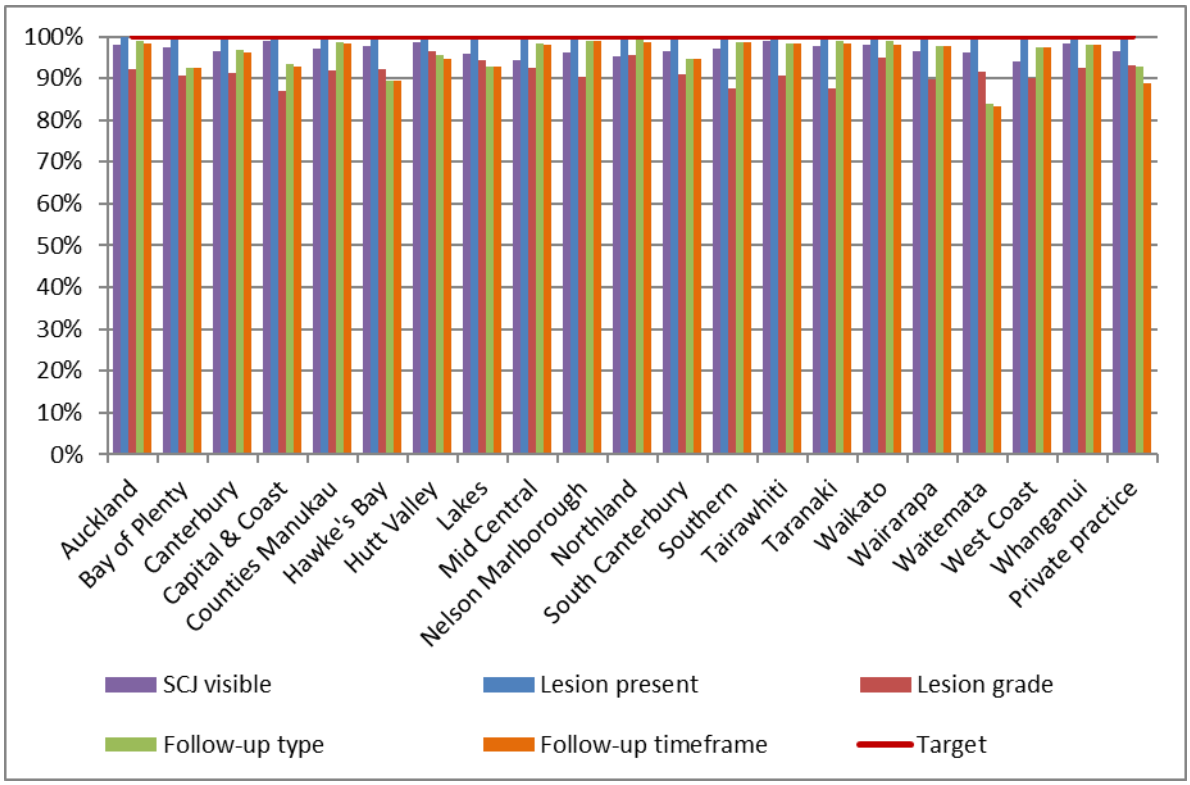
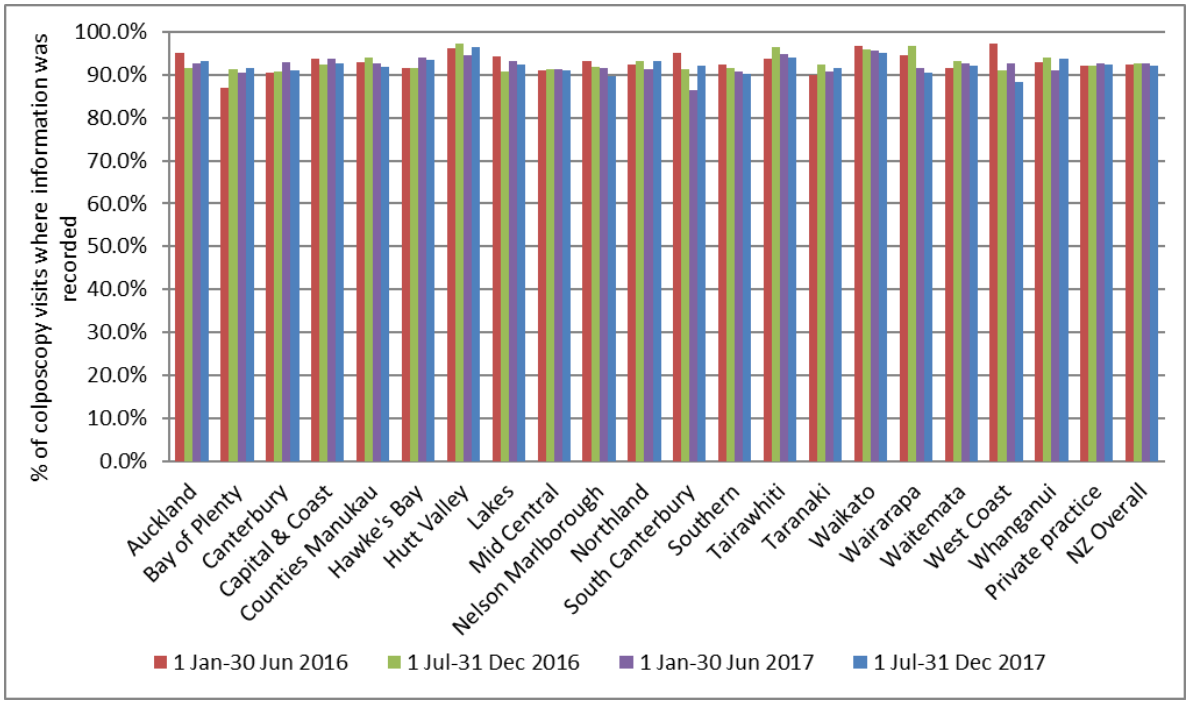
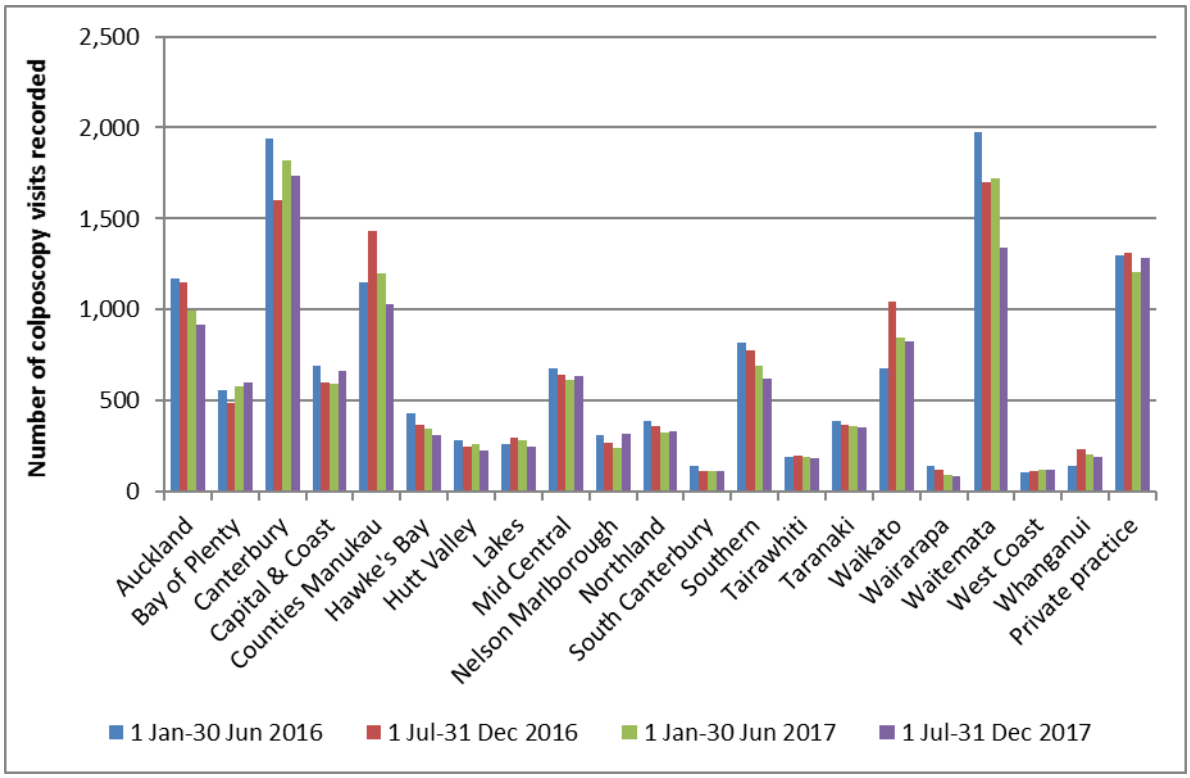


Figure 88 - Trends in the completion of all required colposcopic assessment fields, by DHB



Note: Definition of 'all fields completed' changed from 1 January 2015 as two fields were no longer included in the calculation (follow-up type and timeframe)

Figure 89 - 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 CIN1 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 2017). HSIL results must have been reported at least 8 weeks prior to the end of the current monitoring period, and LSIL results must have been reported at least 26 weeks prior to the end of the current monitoring period, in order to allow sufficient follow-up time for this indicator.

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

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

Target

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

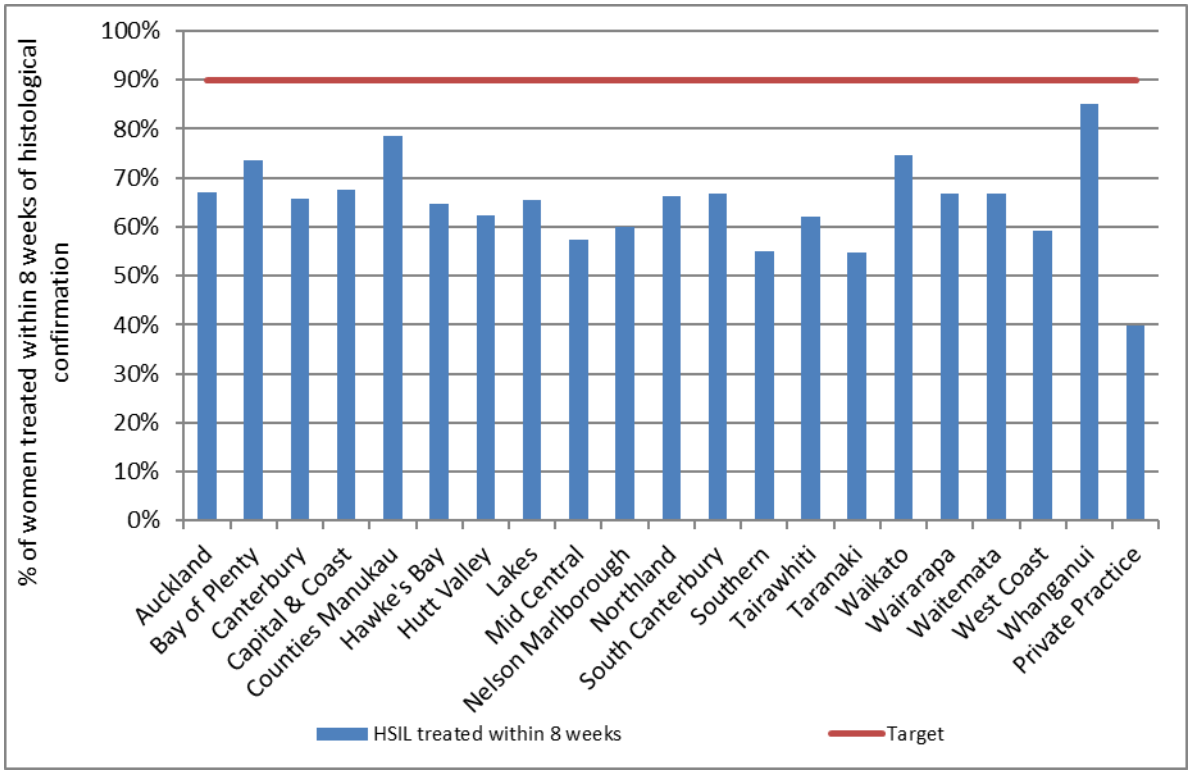
There is no explicit target relating to low-grade lesions, but the standard recommends that the number of women who are treated with low-grade lesions (less than CIN 2 on histology) be minimised.

Current Situation	There were 2,187 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 2017). Of these women, 1,383 women (63.2%) were treated within eight weeks of HSIL being histologically confirmed. The proportion of women treated within eight weeks varied widely by DHB, from 54.7% (Taranaki) to 85.0% of women (Whanganui). No DHBs met the target of at least 90% of women treated within eight weeks of histological confirmation of HSIL (Figure 90, Table 20). There were 1,926 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 2017). Treatment for histological LSIL is not routinely recommended in the 2013 Colposcopy Standards or the 2008 NCSP *Guidelines for Cervical Screening in* New *Zealand*[16], 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 1,926 women with histological LSIL. Of these women, 140 (7.3%) 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 (Hawke's Bay, Nelson Marlborough, South Canterbury, Tairawhiti and Wairarapa) to 19.2% (Northland) (Table 20). The DHB where the largest number of women were treated was Canterbury and Counties Manukau (31 women).
Trends	Nationally, the proportion of women with histological HSIL who were treated within eight weeks of histological confirmation is higher than the previous monitoring report; 61.9% in the previous report, 63.2% in the current report. The proportion of women with histological HSIL who were treated within eight weeks for the current report period increased in 10 of the 20 DHBs when compared with the previous report period (Figure 91). The proportion treated within eight weeks has decreased over the last two monitoring period in nine DHBs (Hutt Valley, Mid Central, Northland, South Canterbury, Southern, Tairawhiti, Taranaki and West Coast) and remained similar in one DHB (Whanganui). The proportion of women with histological LSIL who were subsequently treated (within 26 weeks of LSIL being histologically confirmed) has increased, from 6.7% for the previous report to 7.3% 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". At present, the "decision to treat date" is not available to use due to low completeness of this item on the NCSP Register. When this "decision to treat date" information is available for all DHBs for a full monitoring period, it will be used to calculate timeliness of treatment for women with histological HSIL.

Figure 90 - 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 91 - Trends in the proportion of women treated within eight weeks of histological confirmation of HSIL, by DHB

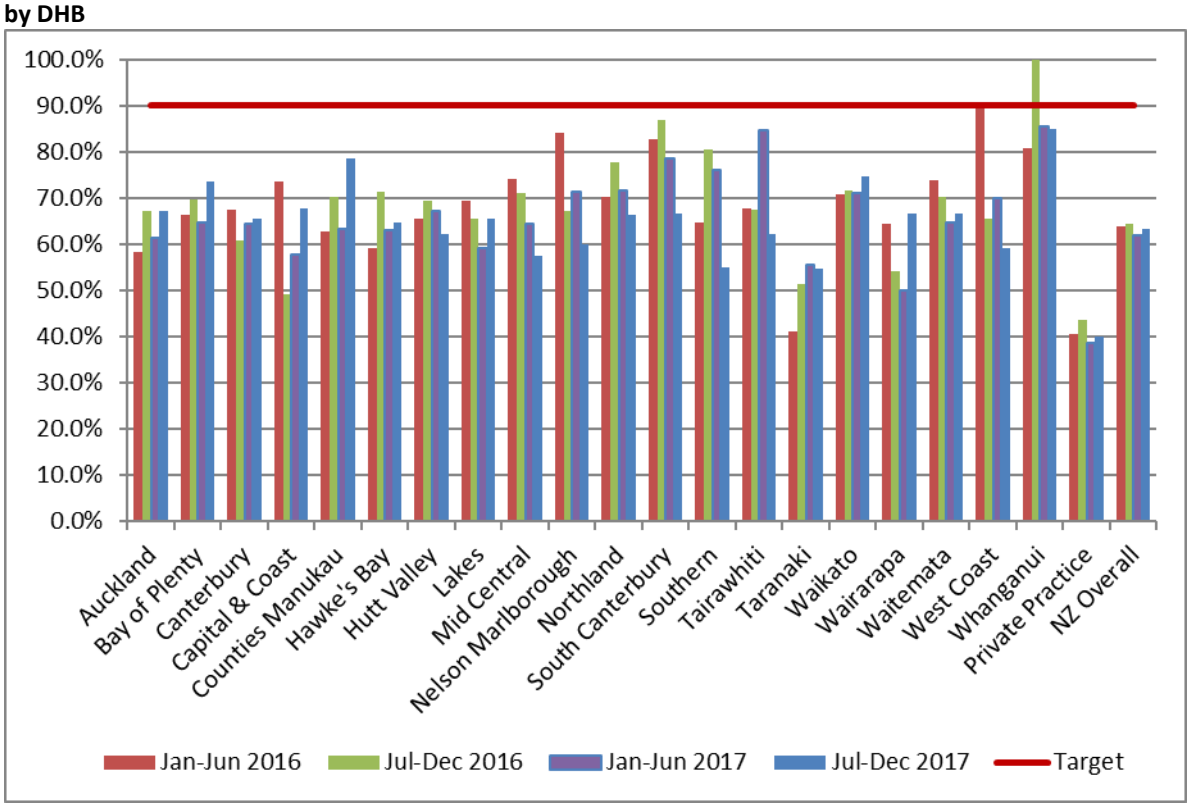


Table 20 - Timeliness and appropriateness of treatment, by DHB

DHB	Women with CIN 2/3	Treated within 8 weeks		Women with histological LSIL*	Women subsequently treated†	
	N	N	%	N	N	%
Public clinics (overall)	*1,889*	*1,264*	*66.9*	*1,547*	*131*	*8.5*
Auckland	146	98	67.1	143	13	9.1
Bay of Plenty	83	61	73.5	67	9	13.4
Canterbury	314	206	65.6	428	31	7.2
Capital & Coast	68	46	67.6	55	5	9.1
Counties Manukau	200	157	78.5	250	31	12.4
Hawke's Bay	82	53	64.6	11	-	-
Hutt Valley	45	28	62.2	22	2	9.1
Lakes	55	36	65.5	41	4	9.8
Mid Central	115	66	57.4	65	8	12.3
Nelson Marlborough	30	18	60.0	10	-	-
Northland	83	55	66.3	26	5	19.2
South Canterbury	15	10	66.7	5	-	-
Southern	131	72	55.0	42	1	2.4
Tairawhiti	37	23	62.2	22	-	-
Taranaki	64	35	54.7	35	5	14.3
Waikato	173	129	74.6	59	2	3.4
Wairarapa	12	8	66.7	11	-	-
Waitemata	174	116	66.7	196	11	5.6
West Coast	22	13	59.1	31	1	3.2
Whanganui	40	34	85.0	28	3	10.7
Private Practice	*298*	*119*	*39.9*	*379*	*9*	*2.4*
Total	**2,187**	**1,383**	**63.2**	**1,926**	**140**	**7.3**

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 2016). Records for each woman treated in the six-month period ending 12 months prior to the end of current monitoring period were retrieved from the NCSP Register. Among these treated women, the number of women with a colposcopy visit, and with both a colposcopy visits and a cytology sample was calculated. Follow-up colposcopy visits were not restricted to only those within the same DHB as where initial treatment occurred; rather any colposcopy visit recorded on the NCSP Register for that woman was included. Follow-up visits were retrieved for the period up to nine months after the treatment visit.

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

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

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

Target	90% or more of women treated for CIN 2 or 3 should have a colposcopy and smear within the nine-month period post-treatment 90% or more of women treated for CIN 2 or 3 should be discharged back to the sample taker as appropriate.
Current Situation	There were 1,589 women treated for CIN 2 or CIN 3 lesions in the six-month period from 1 July - 31 December 2016. These women were followed up for 12 months from the date of their treatment visit. ***Follow-up post treatment*** There were 1,231 women (77.5%) with a follow-up colposcopy, and 1,216 women (76.5%) with both a follow-up colposcopy and a cytology sample in the nine month period after their treatment visit. Figure 92 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 69). The maximum number of women with colposcopy only and no record of a cytology sample in the timeframe was at most five in Counties Manukau and Hawke's Bay. Nationally, the percentage of women treated for high-grade lesions with a record of colposcopy and cytology within the nine-month period post-treatment (76.5%) is below the target value of 90%. Two DHBs met the target of at least 90% of women receiving cytology and colposcopy within nine months post-treatment (Figure 92, Table 69) 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 39.1% (Bay of Plenty) to all women (Wairarapa). ***Women discharged appropriately*** In total, 1,197 women (75.3% of those treated) were eligible to be discharged by 12 months after their treatment visit, and 1,027 of these women (85.8%) were discharged within 12 months of treatment (Table 68). Figure 93 shows how these percentages varied by DHB. The percentage of women eligible for discharge who were discharged within 12 months of treatment ranged from 67.7% (Auckland) to all eligible women (Hutt Valley and Wairarapa) (Table 68). In some cases, the number of women eligible for discharge was small, so these results should be interpreted with caution (11 or fewer women in South Canterbury, Wairarapa and West Coast). Eight DHBs met the target of discharging 90% of women where appropriate within 12 months (Capital & Coast, Counties Manukau, Hutt Valley, Nelson Marlborough, Southern, Waikato, Wairarapa and West Coast).

	In total (that is, without considering whether or not women met the criteria suggested by the NCSP Advisory Group to be eligible for discharge), 1,165 women were discharged within 12 months of being treated for a high-grade lesion (73.3% of all women treated for a high-grade lesion).
Trends	The proportion of women with follow-up has increased overall (from 76.4% to 77.5% for colposcopy, and from 75.1% to 76.5% for both cytology and colposcopy). Two DHBs met the target of 90% of women having colposcopy and cytology within nine months of treatment, compared to no DHBs in the previous report. The proportion of women discharged appropriately to their sample taker by 12 months has increased (84.0% in the previous report; 85.8% in the current report). The number of DHBs meeting the target of 90% decreased from eleven to eight.
Comments	Since this indicator relies on colposcopy data in the NCSP Register, there is the possibility that incomplete reporting of colposcopy visits has led to an underestimate of the number of women with follow-up colposcopy visits and the number discharged in a given time period. The data used in this analysis was extracted from the NCSP Register in late February 2018. The target that 90% or more of women treated for CIN 2 or 3 should be discharged back to the sample taker as appropriate was assessed in this monitoring report, based on guidance from the NCSP Advisory Group as to when discharge would be appropriate. However, it should be noted that neither the 2008 NCSP Guidelines for Cervical Screening in New Zealand nor the 2013 Colposcopy Standards themselves provide explicit guidance for when discharge back to the sample taker is appropriate. In some circumstances, women may be treated within one DHB, but referred to another DHB for follow-up. This information is not always recorded in the NCSP Register, however this measure does take into account all follow-up visits which women attend, regardless of the DHB in which they occurred. For clarity in this report, women remain assigned to the DHB where their treatment was performed.

Figure 92 - Percentage of women treated with colposcopy, and both colposcopy and cytology, within nine months post-treatment, by DHB

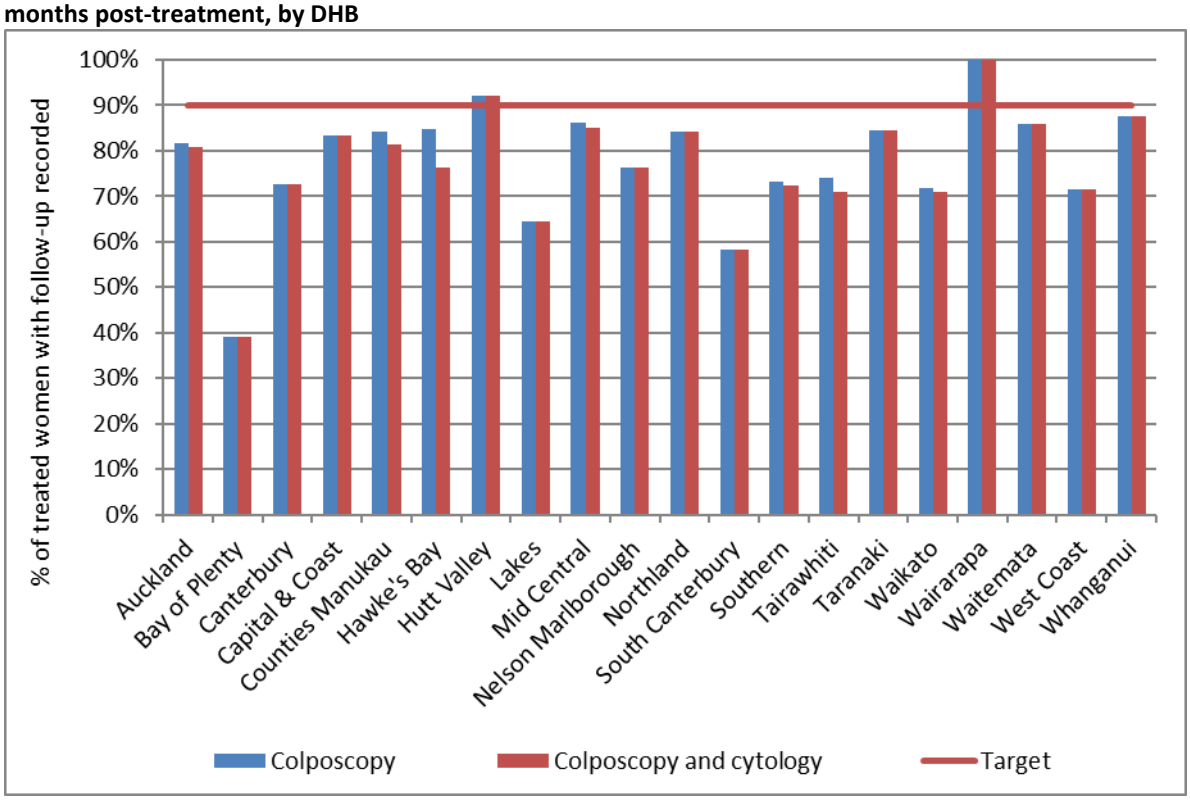
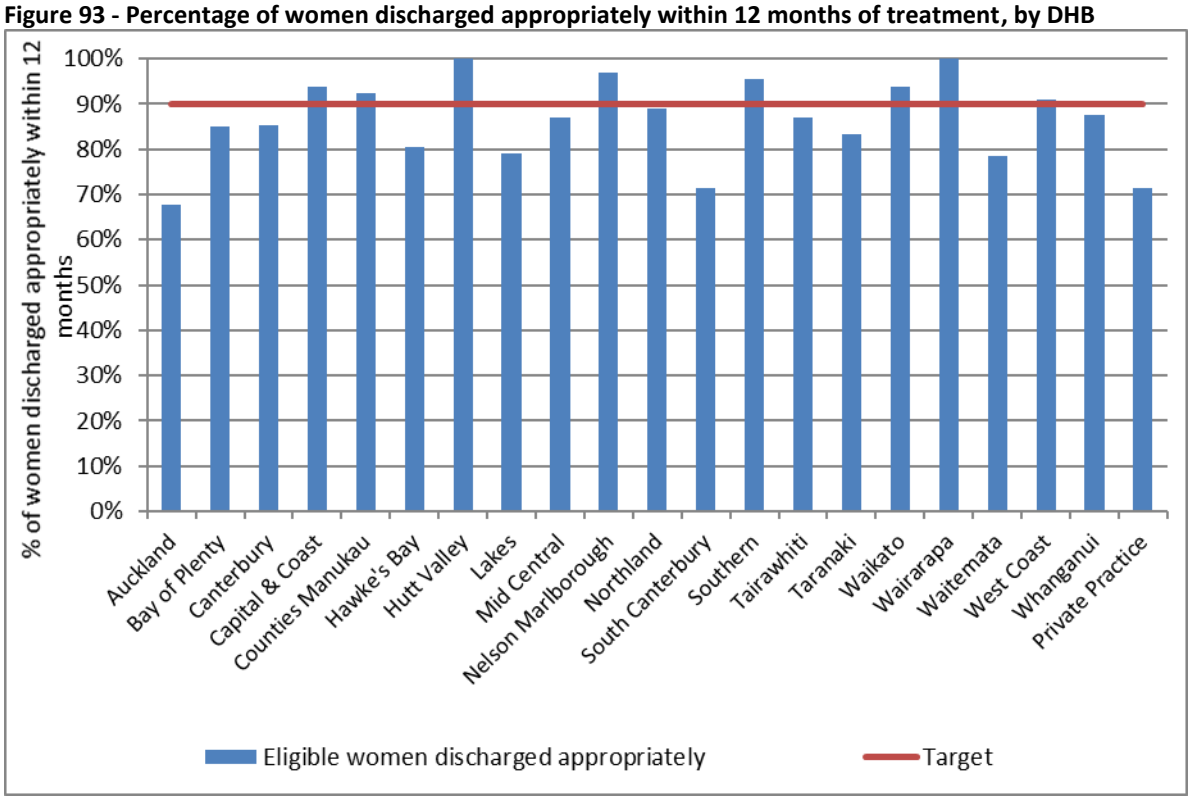


Figure 93 - Percentage of women discharged appropriately within 12 months of treatment, by DHB



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 680 women aged less than 30 years and 1,372 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 2,166 women aged less than 30 years and 1,511 women aged 30 years or more.

HPV triage

NCSP Guidelines (2008) recommend that women aged 30 years or more who have not had an abnormal cytology report in the previous five years are offered a HPV triage test following ASC-US or LSIL cytology. Among these eligible women, 97.4% of women aged 30 years or more with an ASC-US cytology result, and 97.6% of women aged 30 years or more with an LSIL cytology result are recorded as having a subsequent HPV test (Table 70, Table 71). These proportions ranged from 92.8% (Medlab Central Ltd.) to 98.8% (Pathlab) for ASC-US cytology results and from 89.4% (Medlab Central Ltd.) to 99.3% (Pathlab) for LSIL cytology results (Figure 94, Table 70, Table 71).

HPV triage is not included in the recommendations for women aged less than 30 years, and accordingly the proportions of women aged less than 30 years with a subsequent HPV test are very small. Subsequent HPV tests are recorded in the NCSP Register for 1.8% of women aged less than 30 years with ASC-US results, and 0.7% of women aged less than 30 years with LSIL results. These proportions ranged from no women (Canterbury Health Laboratories, LabPLUS and Medlab Central Ltd.) to 4.8% (Pathlab) for women with ASC-US results, and from no women (Pathlab) to 0.9% (Canterbury Health Laboratories, LabPLUS and Southern Community Laboratories) for women with LSIL results (Table 70, Table 71).

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 25.5% for women with ASC-US results, and 60.1% for women with LSIL results. These proportions varied by laboratory from 14.5% (LabPLUS) to 32.0% (Southern Community Laboratories) for women with ASC-US cytology (Figure 95), and from 45.0% (LabPLUS) to 67.9% (Canterbury Health Laboratories) for women with LSIL cytology (Figure 96).

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 (32.6%), and for those with LSIL cytology (64.1%). HPV positivity rates generally decreased with increasing age, but were broadly similar for women in each of the 10-year age groups between 40 and 69 years. For women with ASC-US results, the positivity rates in the 10-year age groups between 40 and 69 years ranged between 18.7% and 24.3% (Figure 97, Table 21). For women with LSIL results, the positivity rates were between 57.0% and 58.2% for these 10-year age groups (Figure 97, 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 2016. In this period, there were 325 women with an ASC-

US cytology result and positive HPV triage test, and 801 who had an LSIL cytology result and positive HPV triage test. 296 (91.1%) of the women with ASC-US who were triage-positive and 749 (93.5%) of the women with LSIL who were triage-positive had a record of colposcopy and/ or histology within the 12 months following their initial test results. Among the women with a record of colposcopy, 197 (66.6%) and 538 (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 26.9% for HPV triage-positive ASC-US and 21.2% for HPV triage-positive LSIL (Table 72, Table 73). These percentages varied by laboratory from 10.3% (Anatomical Pathology Services) to 43.3% (Medlab Central Ltd.) for HPV triage-positive ASC-US and from 14.4% (Anatomical Pathology Services) to 31.4% (Medlab Central Ltd.) for HPV triage-positive LSIL (Figure 98).

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 17.9% for HPV triage-positive ASC-US and 15.2% for HPV triage-positive LSIL (Table 72, Table 73). These percentages varied by laboratory from 6.8% (Anatomical Pathology Services) to 33.3% (Medlab Central Ltd) for HPV triage-positive ASC-US and from 10.7% (Anatomical Pathology Services) to 22.4% (Medlab Central Ltd.) for HPV triage-positive LSIL (Figure 99). 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 99.

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 101), and as a percentage of women with colposcopy recorded (Figure 102). Among women aged 30-69 years, the percentage of women with CIN 2+ histology within 12 months generally decreased with increasing age for HPV triage-positive ASC-US and LSIL. There were no cases of CIN 2+ among women aged 70+ years with ASC-US or LSIL and a positive HPV triage test. The age group with the highest proportion of triage positive women with CIN2+ histology was 30-39 years for both ASC-US and LSIL (29.9% and 23.5%, respectively).

Trends

HPV triage

The proportion of women aged 30 years or more with low-grade cytology (and no recent abnormal cytology in the preceding five years) who received a subsequent HPV test is similar to the previous report for women with ASC-US results (97.7% in the previous period compared to 97.4% in the current period), but increased for women with LSIL results (96.9% in the previous period

compared to 97.6% in the current period). The proportion of women aged less than 30 years with a subsequent HPV test is similar to the previous monitoring period for ASC-US and for LSIL results (1.2% in the previous period compared to 1.8% in the current period for ASC-US; and similar in the previous (0.6%) and current period (0.7%) for LSIL).

Positive triage tests

The proportion of women aged 30 years or more who tested positive for a high risk HPV type is slightly higher for ASC-US in current report (24.8% in the previous report; 25.5% in the current report), and also for LSIL (58.5% in the previous report; 60.1% in the current report).

Histological outcomes in triage-positive women who attended colposcopy

91.1% of women with ASC-US cytology and a positive HPV triage test in the six-month reference period for the current report had a record of colposcopy and/or histology within the 12 months following their test result, which has increased since the previous report (89.4%). For the current report, 66.6% of these women with colposcopy also had a histology record, which is similar to the previous report (66.7%). Of these women with a histology record, the histology result was CIN 2+ for 26.9% of women in the current report, compared with 23.4% 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 17.9% in the current report versus 15.6% in the previous report. While the proportion of triage-positive ASC-US women with CIN 2+ histology (among who attended colposcopy) increased overall, it decreased compared to the previous report at three of six laboratories (Anatomical Pathology Services, Canterbury Health Laboratories, LabPLUS; Figure 103). Caution must be taken when interpreting differences at LabPLUS due to frequently having small numbers of triage-positive women and therefore highly variable percentages).

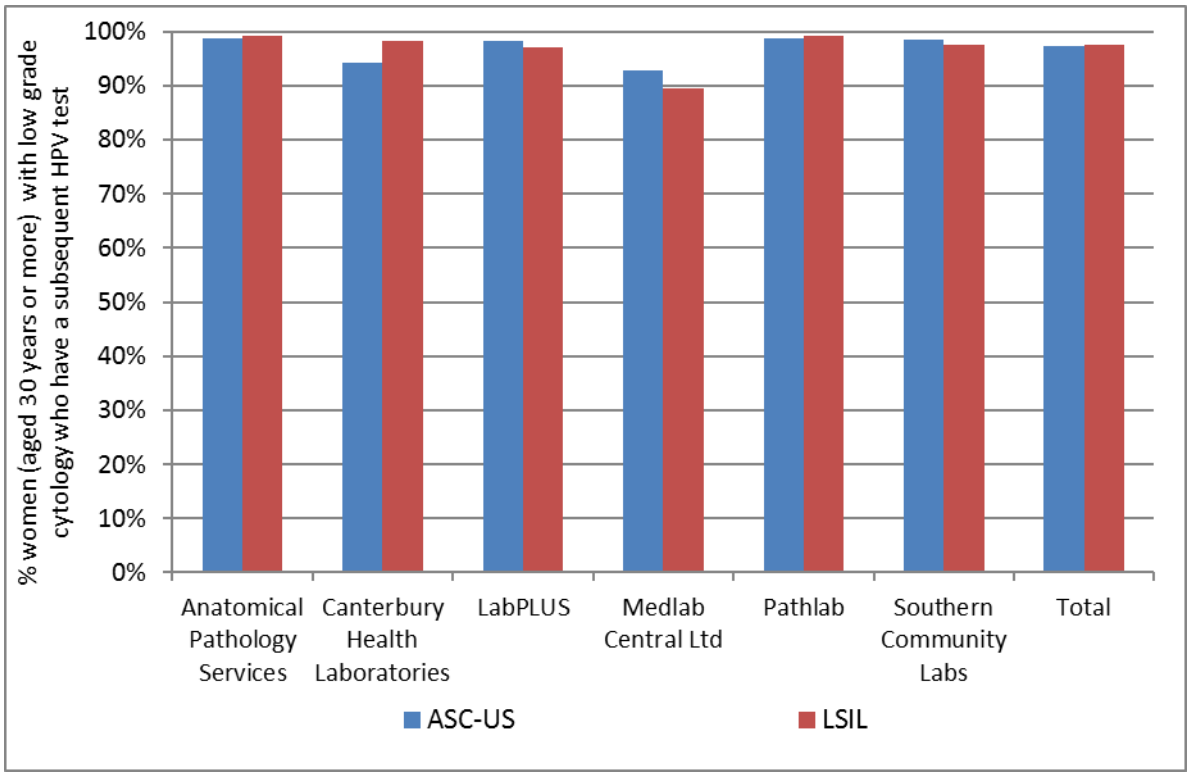
For women with LSIL cytology and a positive HPV triage test in the reference period for the current report, 93.5% had a record of colposcopy and/ or histology within 12 months of their result, which is higher than the 91.4% of women in the previous report. For the current report 71.8% of these women with colposcopy also had a histology record, compared with 77.1% in the previous report. Of these women with a histology record, the histology result was CIN 2+ for 21.2% of women in the current report, compared with 23.1% in the previous report. When histological CIN 2+ outcomes were considered as a proportion of women with colposcopy, rather than histology, the corresponding figures were 15.2% for the current report and 17.8% for the previous report. Trends in this proportion of LSIL triage-positive women with CIN 2+ histology (among those who attended colposcopy) are shown in Figure 104. The proportion with CIN2+ histology decreased in four laboratories (Anatomical Pathology Services, Medlab Central Ltd, 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 (27 women). This is the same number of women as in the previous report. 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.[17, 18] 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 94 - 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 95 - Proportion of HPV triage tests which are positive following ASC-US cytology (women aged 30 years or more), by cytology laboratory

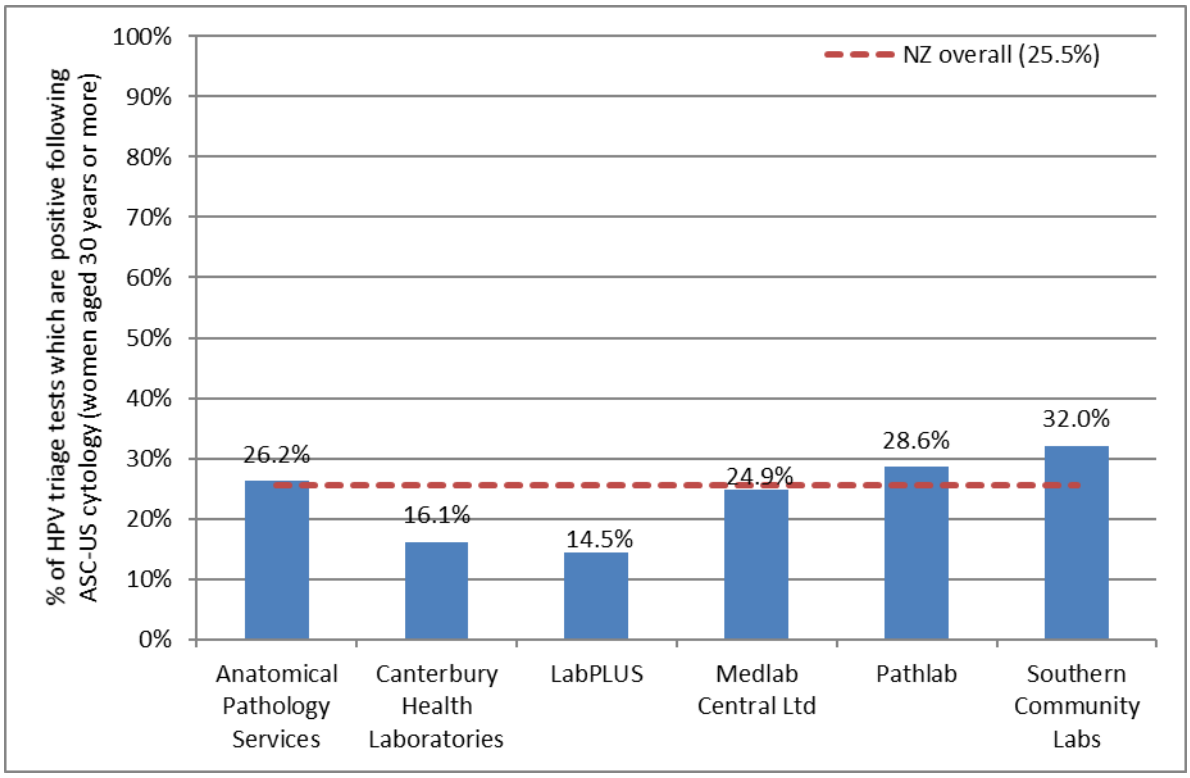


Figure 96 - Proportion of HPV triage tests which are positive following LSIL cytology (women aged 30 years or more), by cytology laboratory

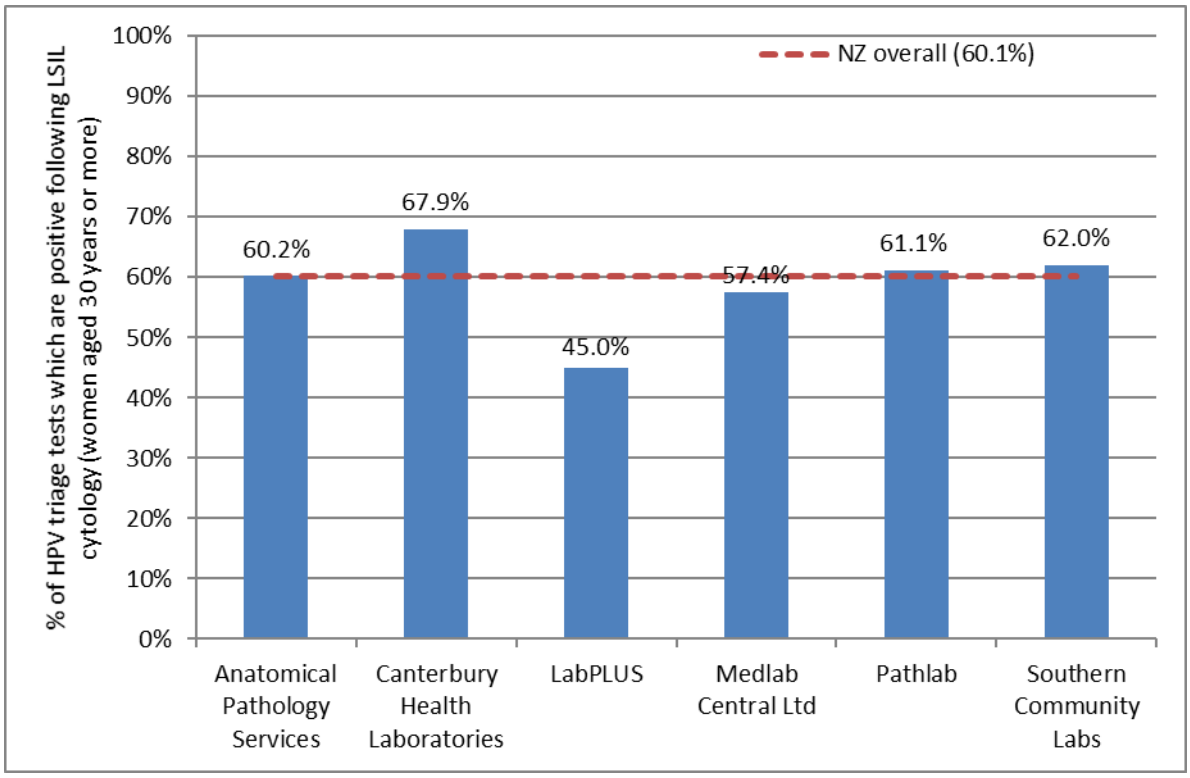
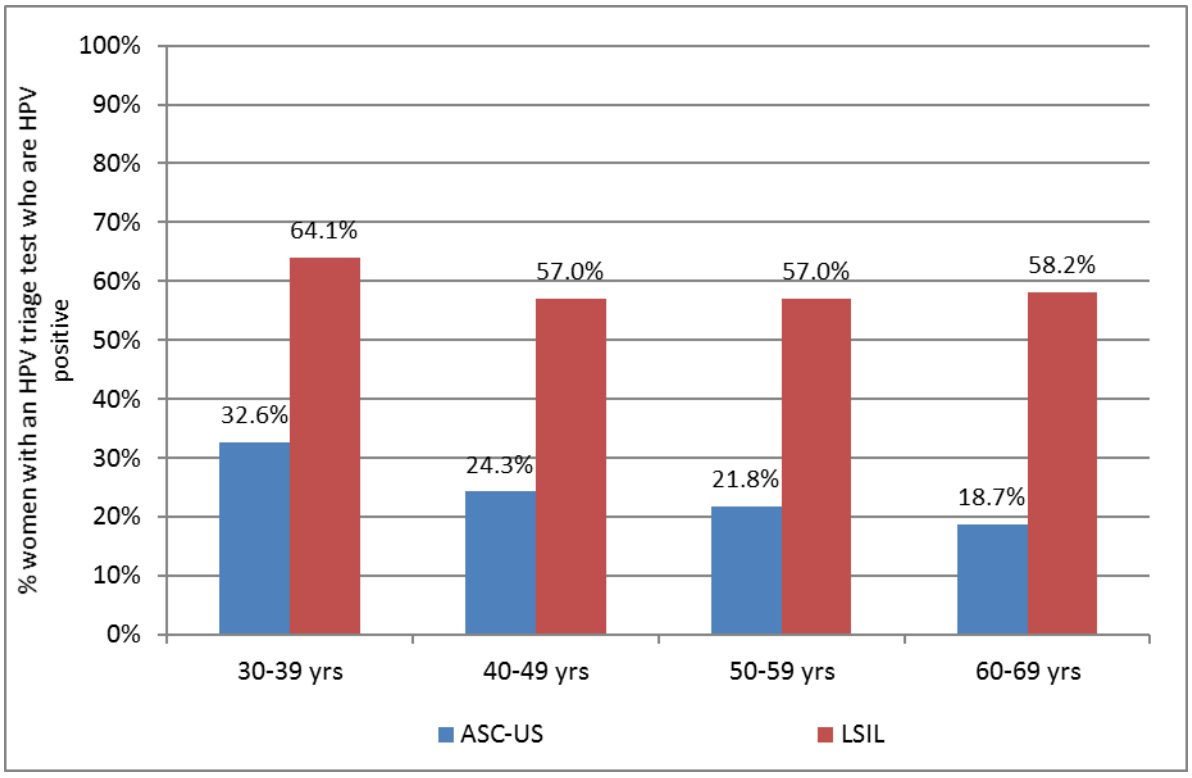


Figure 97 - Proportion of women with an HPV triage test who are HPV positive, by age and cytology result



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

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

Laboratory	Women with valid HPV test results		Women with positive HPV test results (number and % within each age group)											
	<30yrs*	30+ yrs	< 30yrs*		30-39 yrs		40-49 yrs		50-59 yrs		60-69 yrs		70+ yrs	
	N	N	N	%	N	%	N	%	N	%	N	%	N	%
Anatomical Pathology Services	4	290	3	75.0	33	36.7	21	24.4	12	16.9	10	26.3	0	0.0
Canterbury Health Laboratories	0	112	0	0.0	12	26.7	0	0.0	6	26.1	0	0.0	0	0.0
LabPLUS	0	159	0	0.0	9	17.6	9	17.0	4	13.3	1	4.5	0	0.0
Medlab Central Ltd.	0	181	0	0.0	20	36.4	14	23.3	8	17.8	3	16.7	0	0.0
Pathlab	6	315	5	83.3	30	32.6	29	33.7	19	20.9	10	23.3	2	66.7
Southern Community Laboratories	2	278	2	100.0	34	37.8	25	29.8	22	33.8	7	18.9	1	50.0
Total	**12**	**1335**	**10**	**83.3**	**138**	**32.6**	**98**	**24.3**	**71**	**21.8**	**31**	**18.7**	**3**	**17.6**

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)*

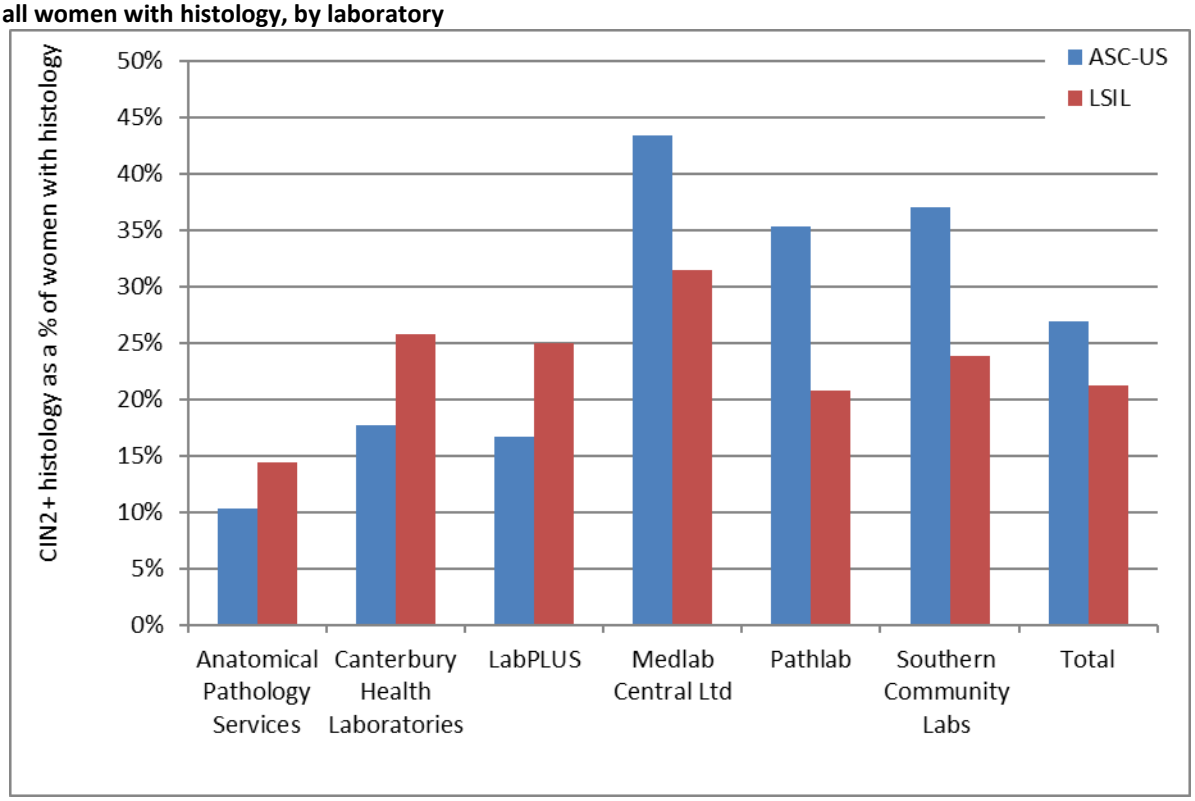
Table 22 - HPV triage test results following LSIL cytology, by age and cytology laboratory

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	3	377	3	100.0	105	62.9	61	54.0	42	63.6	18	62.1	1	50.0
Canterbury Health Laboratories	1	53	1	100.0	16	69.6	11	61.1	5	83.3	4	66.7	0	0.0
LabPLUS	1	100	0	0.0	23	47.9	14	50.0	5	29.4	3	42.9	0	0.0
Medlab Central Ltd.	1	101	1	100.0	30	61.2	12	48.0	11	55.0	5	71.4	0	0.0
Pathlab	0	270	-	-	76	71.7	51	56.7	28	53.8	10	50.0	0	0.0
Southern Community Laboratories	9	574	7	77.8	185	64.7	98	61.6	56	57.7	17	58.6	0	0.0
Total	**15**	**1475**	**12**	**80.0**	**435**	**64.1**	**247**	**57.0**	**147**	**57.0**	**57**	**58.2**	**1**	**14.3**

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

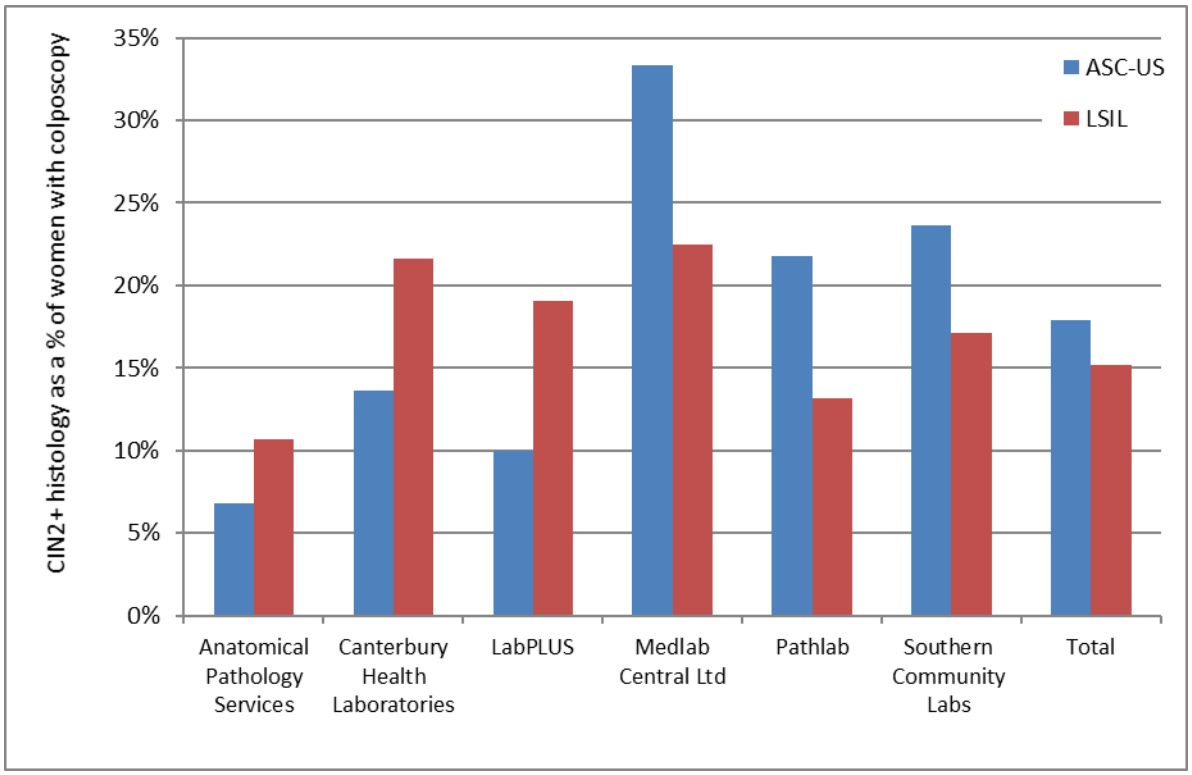
** Additionally excludes women with any previous squamous high-grade (cytology or histology)*

Figure 98 – 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 72 and Table 73).

Figure 99 – 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 72 and Table 73).

Figure 100 - Women with histologically-confirmed CIN 2+ within 12 months, as a percentage of all women who attended colposcopy, by laboratory and referral cytology

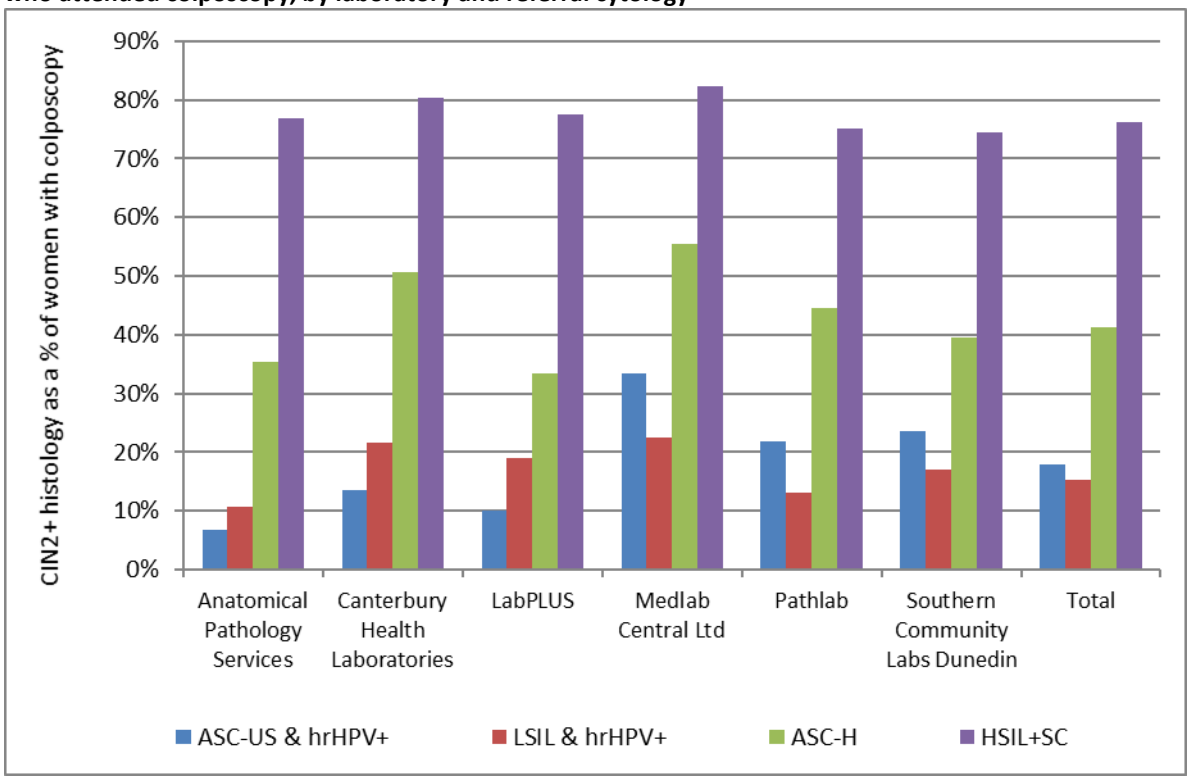


Figure 101 – Triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with histology recorded, by age

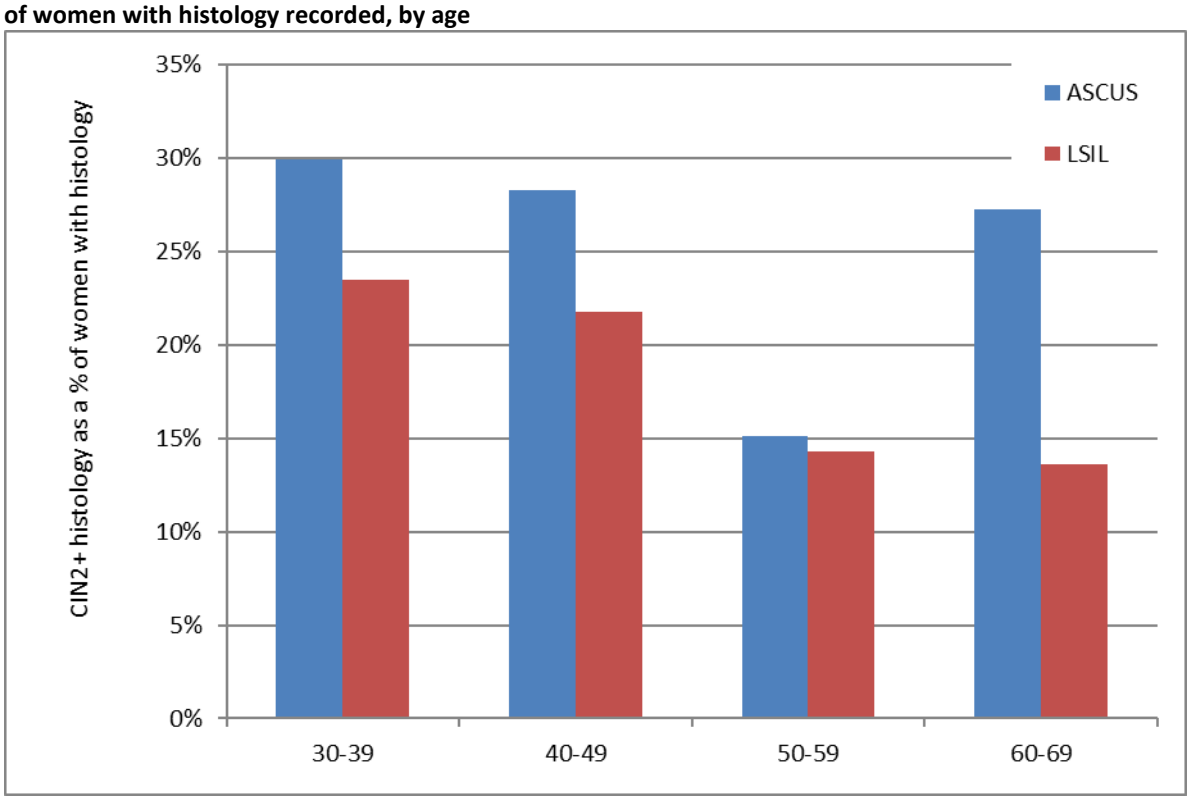


Figure 102 – Triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with colposcopy recorded, by age

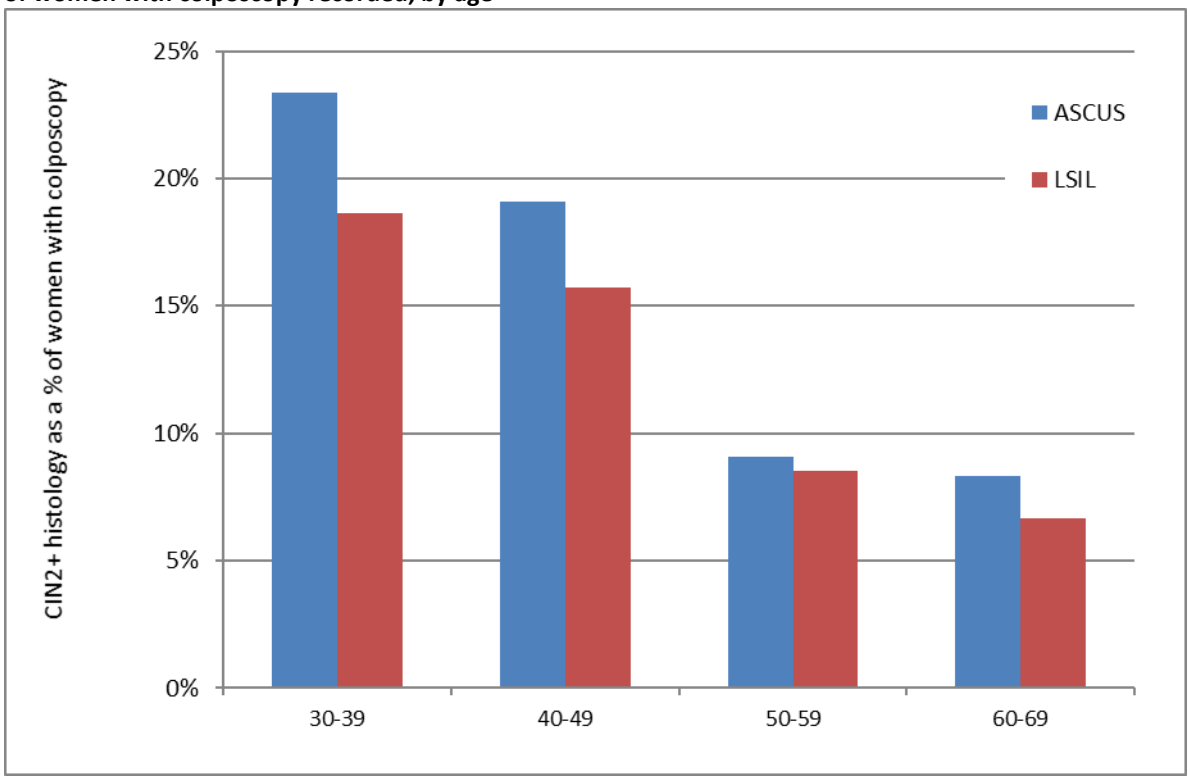
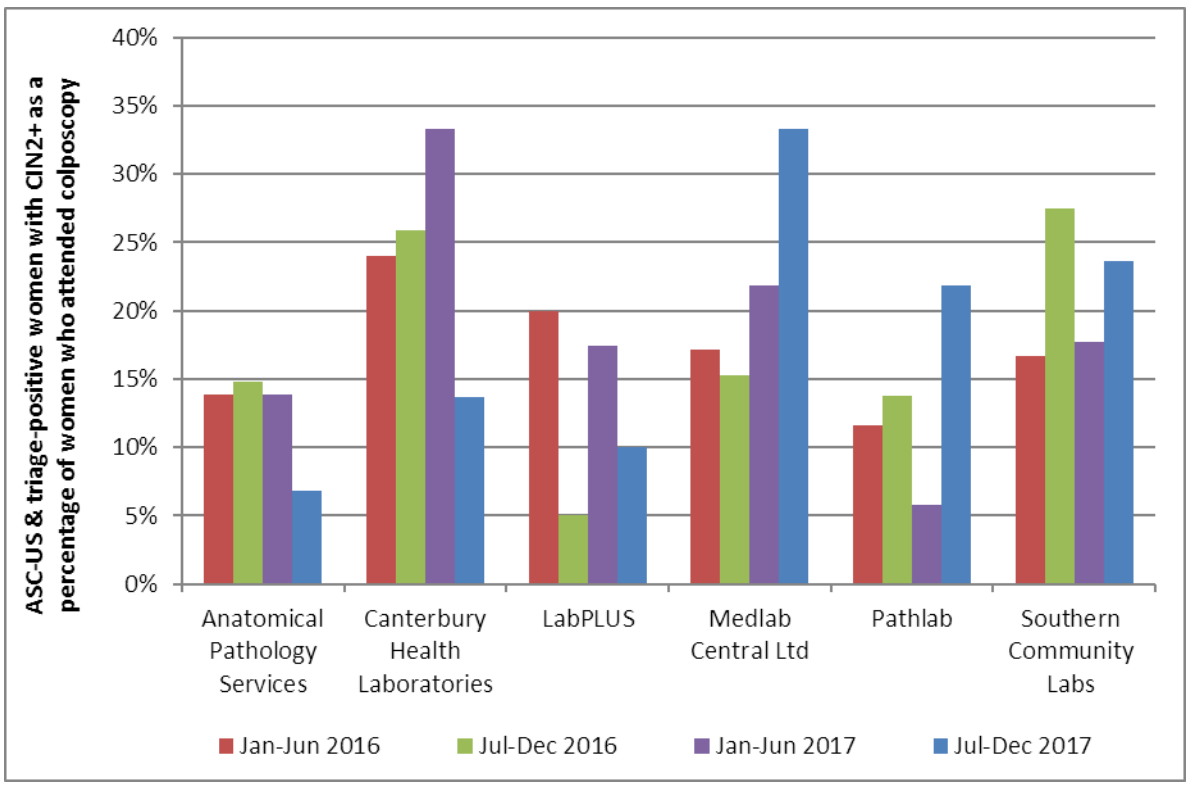
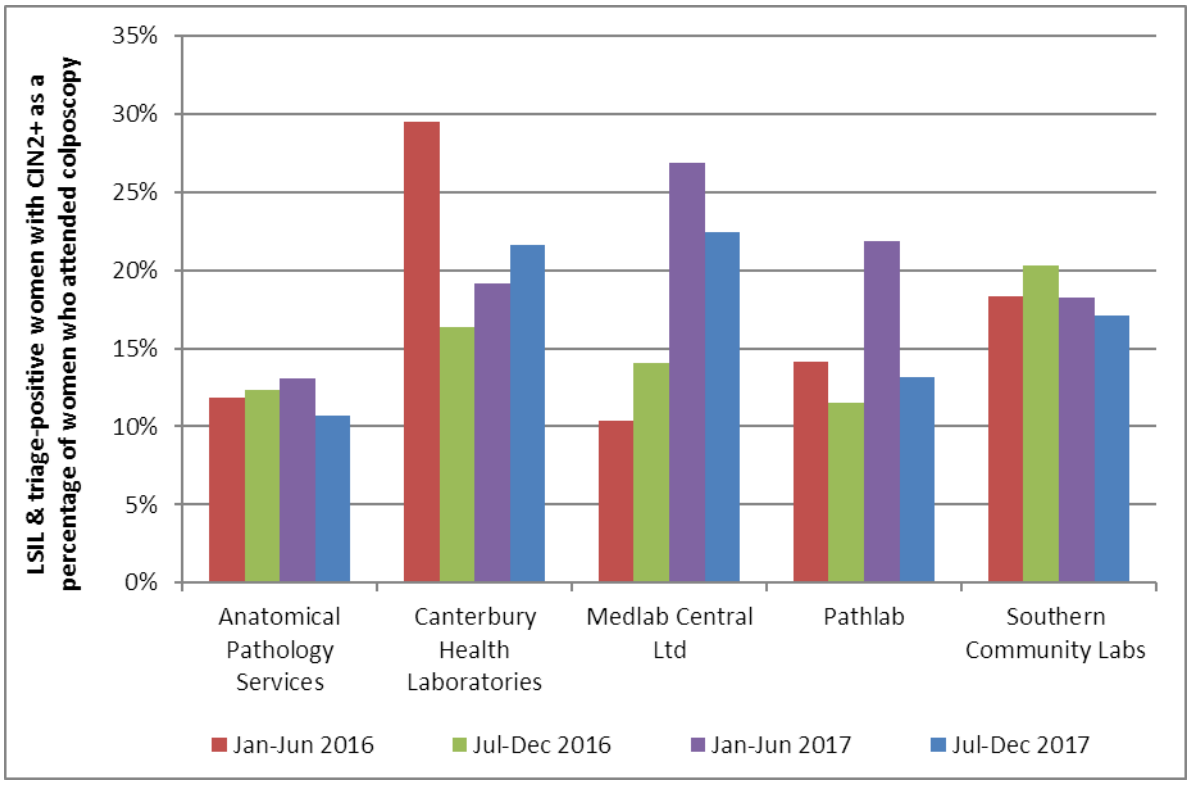


Figure 103 – Trends in ASC-US triage-positive women with histologically-confirmed CIN 2+ within 12 months, as a percentage of women with colposcopy recorded, by laboratory



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 72.

Figure 104 – 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 73.

Indicator 8.2 – HPV test volumes

Definition

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

- Laboratory
- Ethnicity
- Age group
- Purpose

Purpose is defined as one of the following categories:

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

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

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

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

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

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

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

Rates of invalid HPV tests are also reported on.

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

Target

Targets have not yet been set.

Current Situation

Overall volumes

There were 18,230 samples received by laboratories for HPV testing within the current monitoring period. These are reported on further in Table 74 to Table 80.

Virtually all (98.4%) samples for HPV testing were from women aged 20-69 years. The large majority of women (85.7%) were aged 30 years or more (Figure 105, Table 78).

The number of samples received by laboratories for HPV testing ranged from 915 (LabPLUS; 5.0% of all HPV tests) to 7,380 (Southern Community Laboratories; 40.5% of all HPV tests) (Figure 106, Table 74). Figure 107 and Table 74 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 8.8% across New Zealand – that is, on average 8.8% of cytology tests are associated with an HPV test. This ratio varied by laboratory from 7.1% (Southern Community Laboratories; 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 77.

The overall proportion of HPV tests with invalid results was 0.05% (Table 75). The proportion was small for both HPV test technologies reported (Table 76).

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 2,565 (14.1%) were for post-treatment management for women treated in the past four years; 6,769 (37.1%) were for follow-up management of women with high-grade squamous cytology or histology more than three years previously (historical testing); 1,264 (6.9%) were on samples collected at a colposcopy visit which did not fit into a previous category (possibly for resolution of discordant results); and 2,681 (14.7%) were for triage of low-grade cytology in women aged 30 years or more. There were 4,951 (27.2%) HPV tests that did not fit into any of the previously described categories (Figure 108).

Further breakdowns of HPV tests by purpose are presented by age (Figure 109, Table 78), laboratory (Figure 110), and ethnicity (Table 77, Table 79).

There were variations in HPV test purpose by age (Figure 109, Table 78). 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%) or at colposcopy (14.1%). 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 while post-treatment management was most common reason for women aged 25-29 years. Tests which did not fit into the prescribed categories, and were therefore classified as 'Other', were the most common classification among women aged less than 24 years and 55 years and older.

HPV test purpose also varied by laboratory (Figure 110, Table 79). 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 12.7% at LabPLUS to 35.4% Southern Community Laboratories. The proportion of tests performed for post-treatment management varied from 11.0% (LabPLUS) to 24.0% (Canterbury Health Laboratories), while the proportion performed to follow up women with historical high-grade squamous abnormalities varied from 22.4% (LabPLUS) to 43.9% (Anatomical Pathology Services). The proportion of tests where the sample was collected at colposcopy but not for one of the previous purposes ranged from 2.1% (Anatomical Pathology Services) to 25.8% (LabPLUS). The proportion of tests performed for HPV triage ranged from 10.6% (Southern Community Laboratories) to 28.1% (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 77).

Tests in the 'Other' category were further explored. A proportion of the 'Other' tests (2.6%; 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 4.9% occurred after treatment, but did not meet the criteria for post-treatment management because they occurred within 6 months of treatment (1.2%; 60 tests), or after treatment of either a non-squamous high-grade (1.2%; 58 tests), or a non-high-grade (2.4%; 120 tests) or following treatment of cervical cancer (0.1%; 5 tests). A further 16.7% 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 (8.7%; 430 tests), the high-grade squamous cytology was less than three years ago (7.8%; 388 tests), or the histology diagnosis was cervical cancer (0.2%; 10 tests).

A larger proportion of the 'Other' tests (29.7%; 1,470 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 (24.1%; 1,195 tests), but some suggested prior high-grade histology (5.6%; 275 tests). Smaller proportions of HPV tests were associated with a low-grade abnormality, including either a current low-grade cytology result which did not meet the criteria for triage because the woman had another recent abnormality and triage was not required (2.1%; 104 tests), a record suggesting a previous low-grade cytology not explicitly recorded on the NCSP Register (3.3%; 163 tests), or collected by a specialist where none of the above reasons apply (6.0%; 299 test). After this exploration, there remained 1,713 tests (34.6% of 'Other' tests; 9.4% of all HPV tests in the monitoring period) where purpose still could not be determined.

HPV tests at colposcopy

HPV tests taken at colposcopy, were further explored based on the DHB of the colposcopy clinic where the sample was taken and whether or not it was a public or a private clinic. This included only HPV tests where a colposcopy record exists and not those inferred by a histology result. Nationally, more of the HPV tests which were taken at colposcopy came from public facilities (88.4%; 957 tests) than from private facilities (11.6%; 125 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 0.5% (Tairawhiti) to 28.6% (Wairarapa), and was 8.8% overall across all public DHB clinics (Figure 111, Table 80). In private practice, this rate was 9.7%.

Trends

A similar volume of HPV samples was received at laboratories for testing in the current (18,230) and the previous monitoring period (18,891; a decrease of 3.5%). Two laboratories experienced an increase in the number of samples received between the current monitoring period compared with the previous report period. The laboratory with the largest percentage increase in the number of tests between the previous and current period was Medlab Central Ltd. (from 1,629 to 1,816 tests; 11.5% increase) and the largest decrease was at Canterbury Health Laboratories (from 1,500 to 1,280 tests; 14.7% decrease). Trends by laboratory can be seen in Figure 112.

Changes in HPV test volumes varied across all test purpose categories. The greatest increase in the number of tests performed for the four guidelines categories (post-treatment, historical testing, HPV triage or tests at colposcopy) occurred at colposcopy (54.1% increase; 444 tests) and the greatest relative decrease was seen in HPV tests taken for historical reasons (decrease of 6.6% or 475 tests) (Figure 113). A decrease was also seen in both the number of HPV tests in the 'Other' category (618 tests) and also the percent of all HPV tests in this category (from 29.5% to 27.2%). The proportion of tests in each of the other four categories was broadly similar to that seen in the previous report (from 14.4% to 14.1% for post-treatment management; decreased from 38.3 % to 37.1% for historical testing; and 13.4% to 14.7% for triage of low-grade cytology, and increased from 4.3% to 6.9% for tests taken at colposcopy).

Variations in the purpose of HPV tests by age and ethnicity were broadly similar to that in previous reports.

The proportion of HPV tests which are invalid remains very small (Table 76).

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 107, Table 74). 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 ages less than 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 (29.7%) is slightly less than that in the previous report (30.2%), and the number of tests in this category has also decreased since the previous report (from 1,684 to 1,470). 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 previous reports, some HPV tests that were collected at colposcopy were incorrectly classified in the 'Other' category (generally within the sub-category of a recent high-grade abnormality that therefore did not meet the criteria for post-treatment management or historical testing). This has been corrected in the current report and the increase in tests collected at colposcopy is explained by this change. This correction also reduced the number of tests in the 'Other' category, by around 464 (2.5%).

Figure 105 - Volume of HPV test samples received by laboratories during the monitoring period, by age

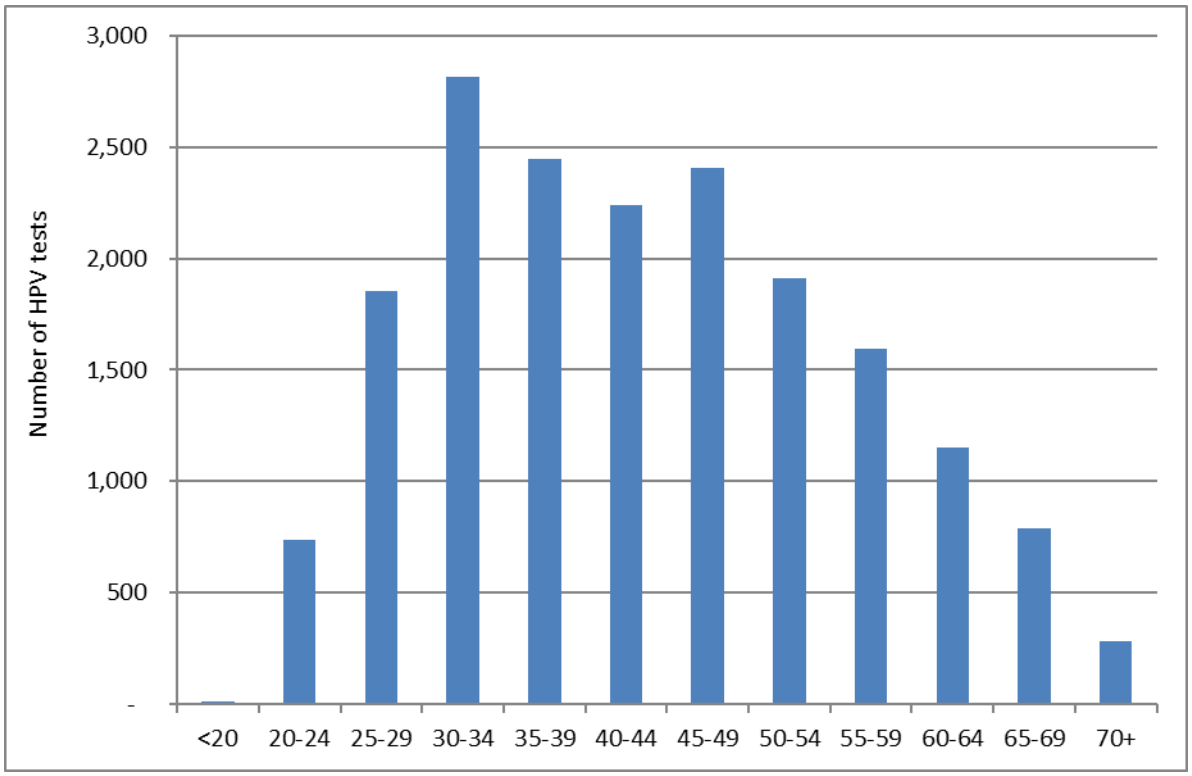


Figure 106 - Volume of HPV test samples received by laboratories during the monitoring period, by laboratory

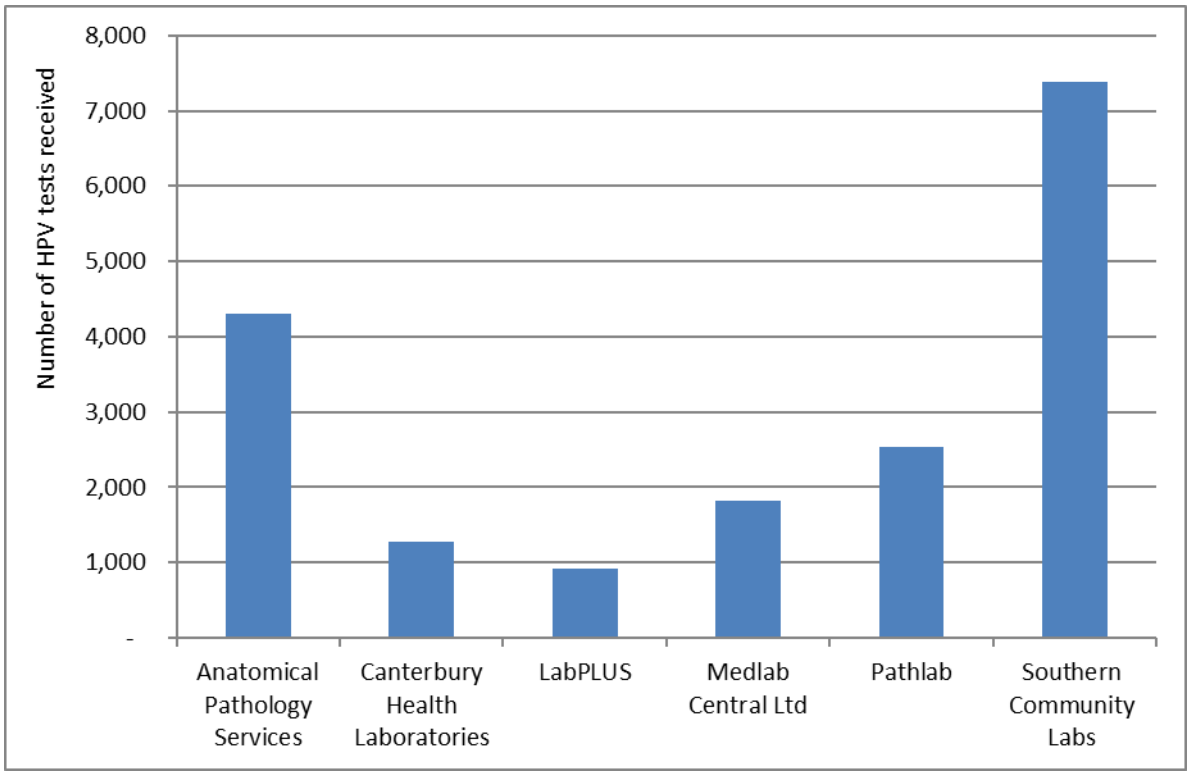
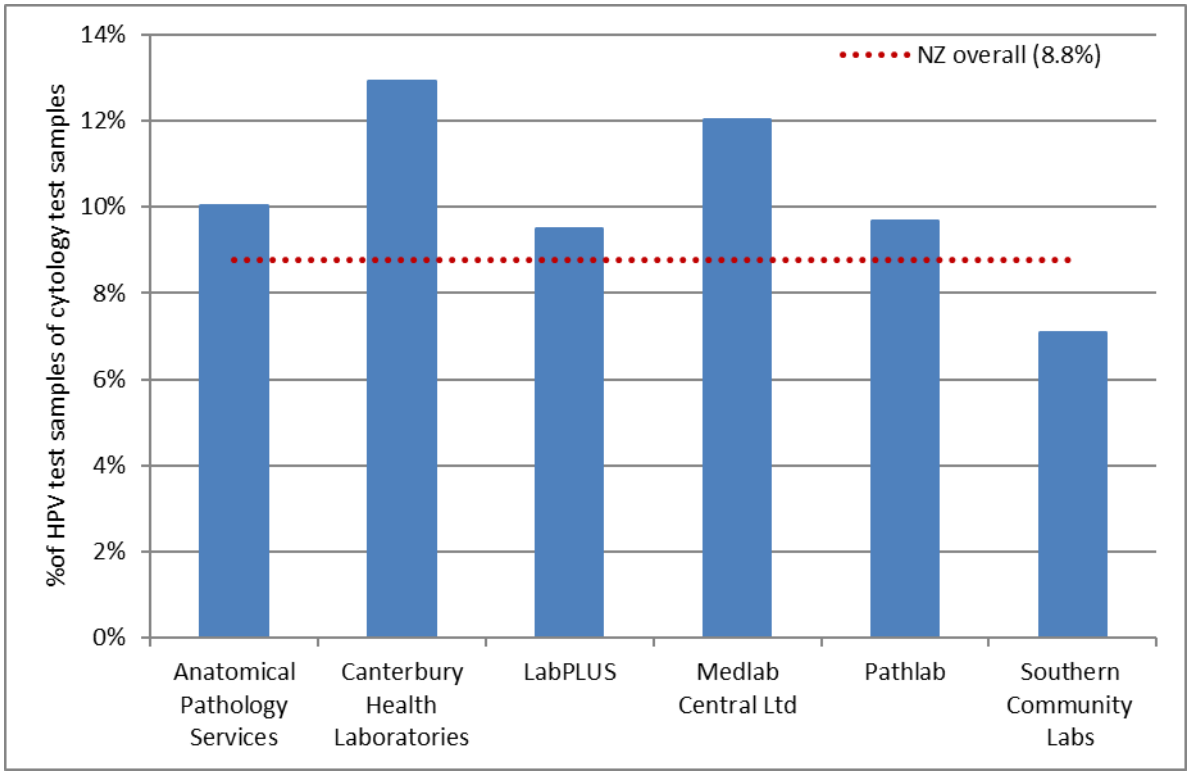


Figure 107 - HPV test samples as a percentage of cytology test samples received during the monitoring period, by laboratory



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

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

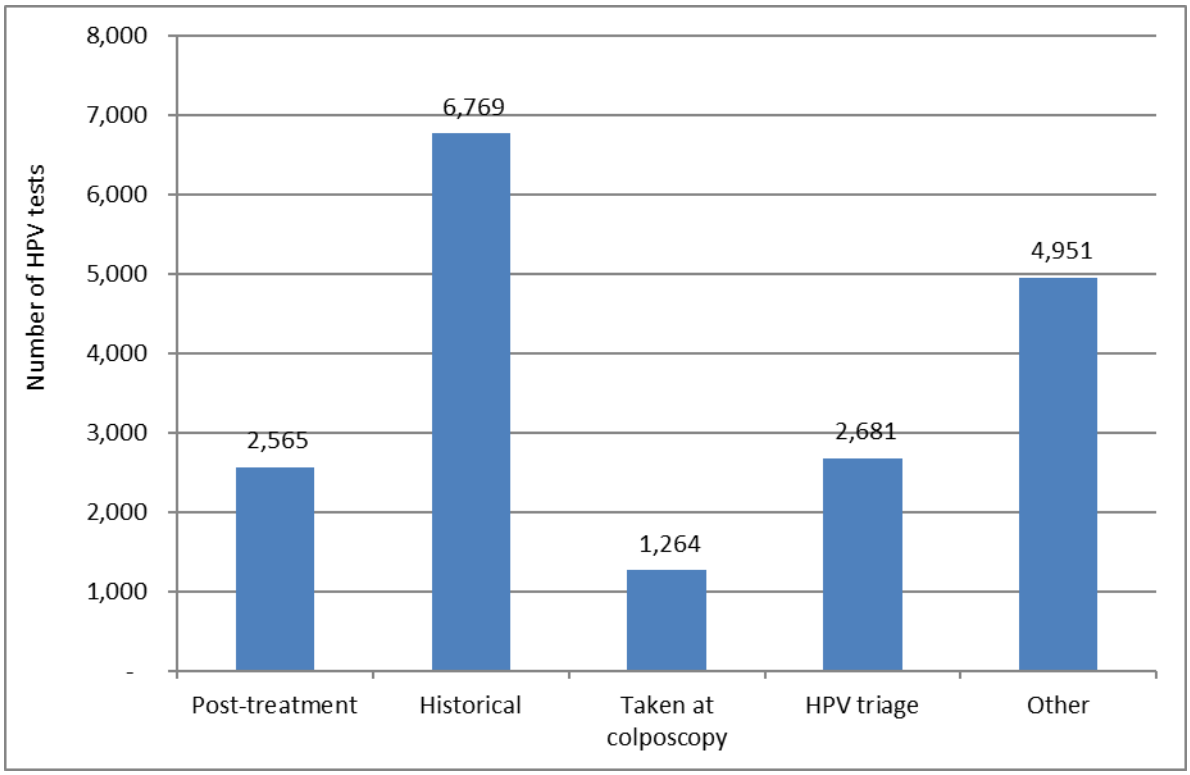


Figure 109 - HPV test samples received during the monitoring period, by purpose and age

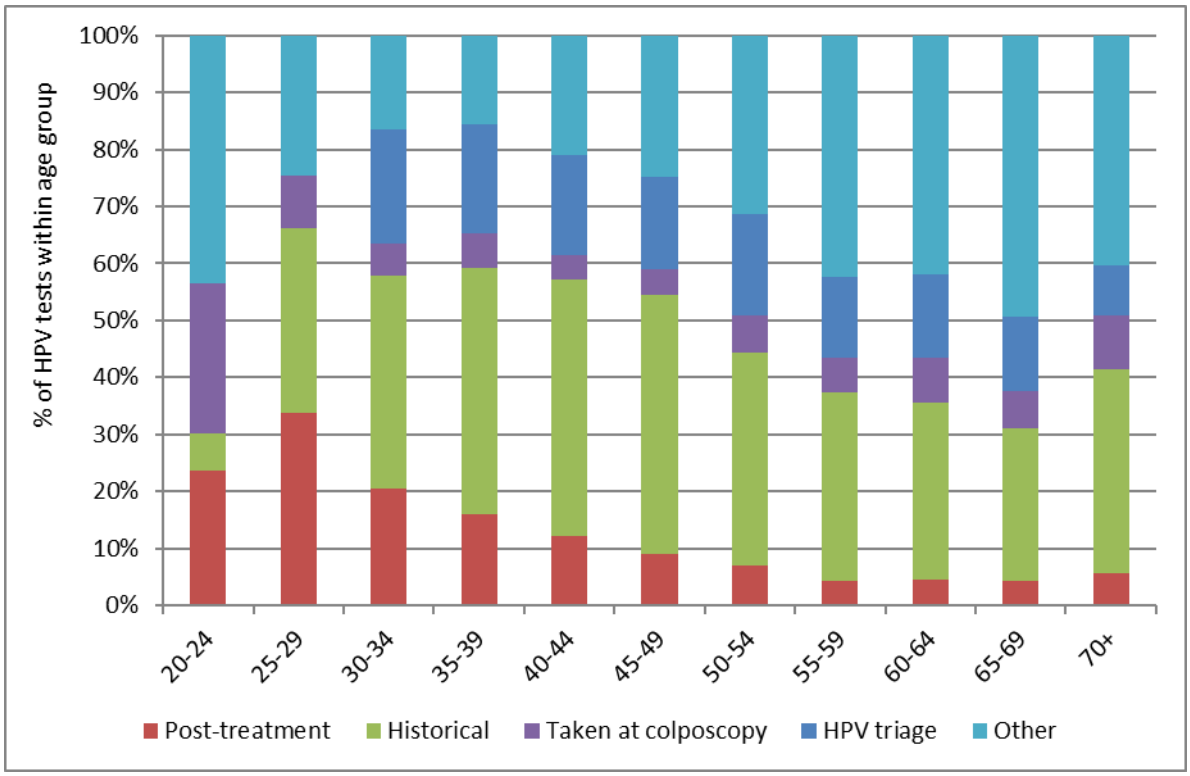


Figure 110 - HPV test samples received during the monitoring period, by purpose and laboratory

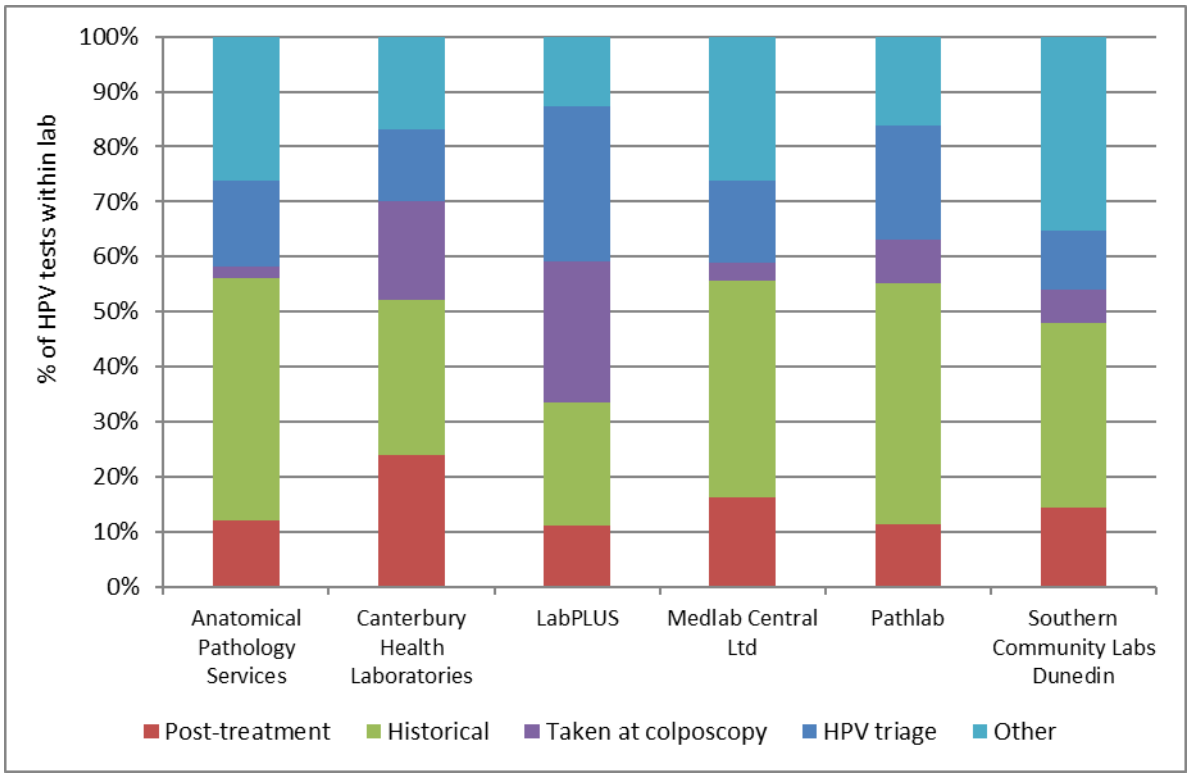
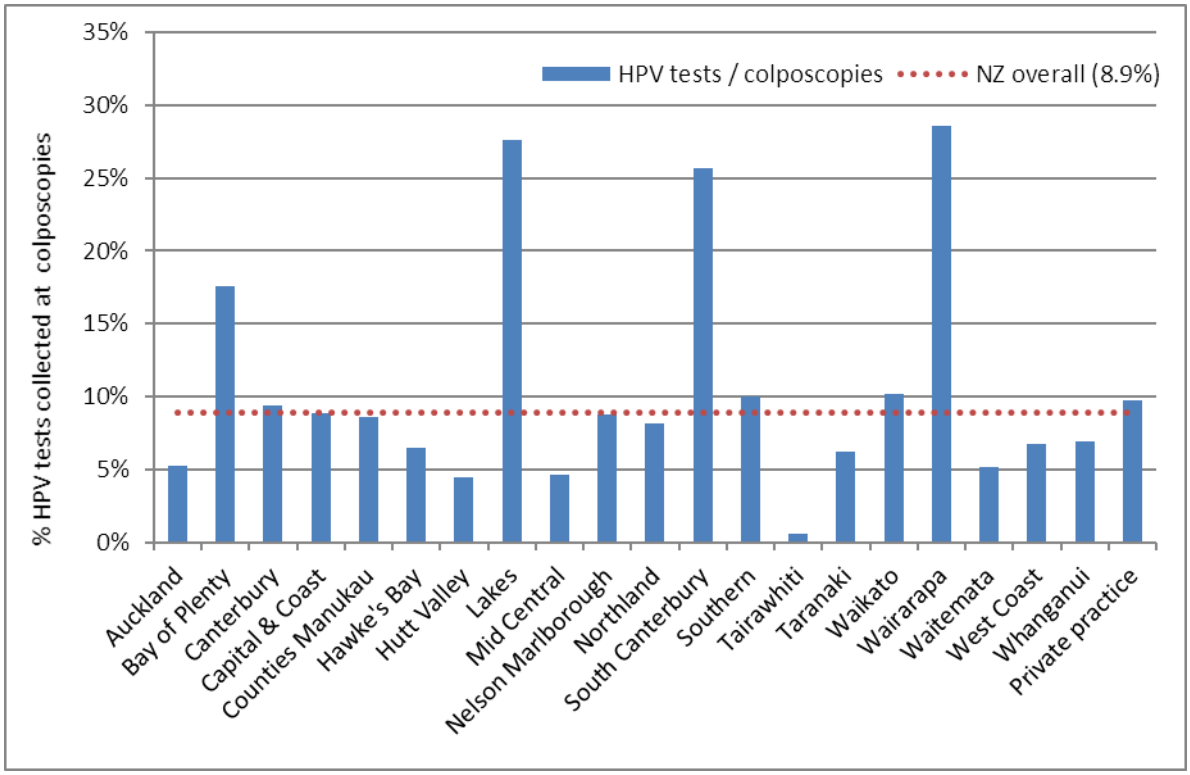


Figure 111 - HPV test samples collected at colposcopy, in relation to total colposcopies* performed in the period, by DHB



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

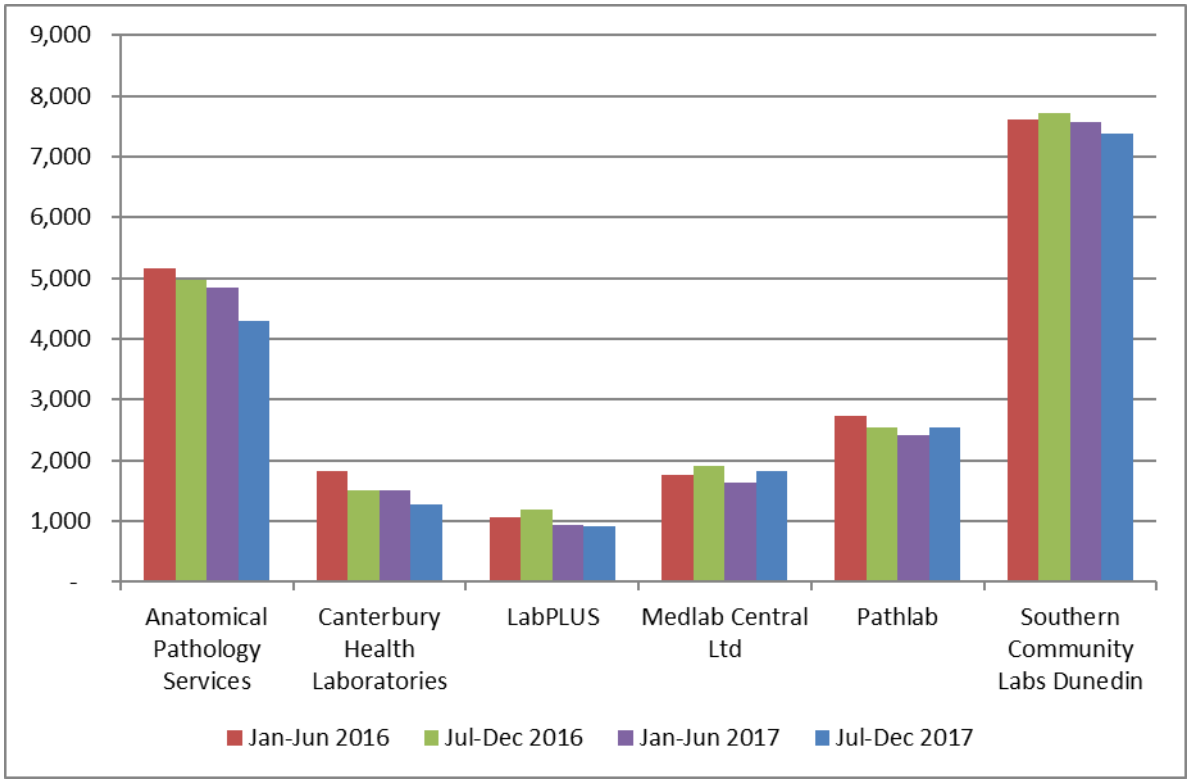
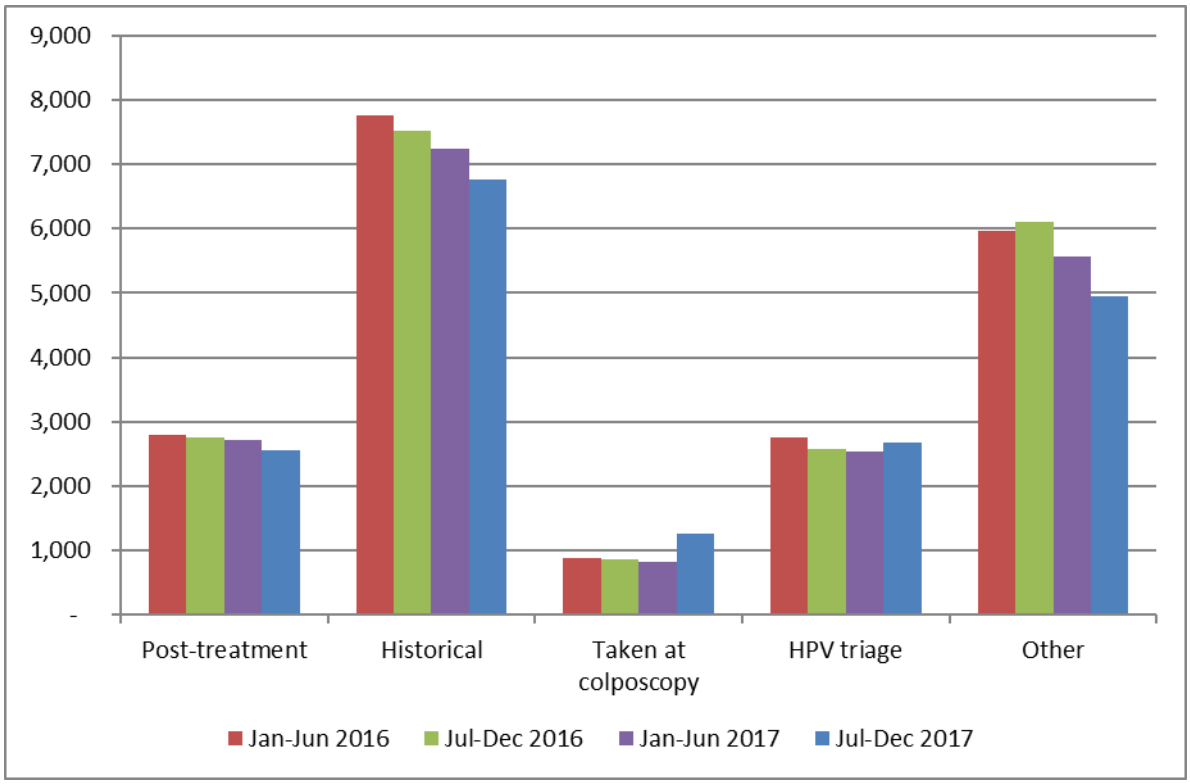


Figure 113 - Trends in volumes of HPV test samples received, by purpose



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 2017). 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 50,506 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, 49,293 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 81).

HPV tests performed for historical reasons

Overall, 32,799 (66.5%) of the women eligible for historical testing have a Round 1 historical test recorded on the NCSP Register. There were 27,024 women who also have a Round 2 historical tests (54.8% of eligible women; 82.4% 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 53.2% (25-29 years) to 69.6% (60-64 years) for Round 1 tests, and from 40.3% (25-29 years) to 59.1% (60-64 years) for Round 2 tests (Figure 114, Table 81).

The proportion of eligible women with historical tests also varied by DHB, from 54.3% (Counties Manukau) to 79.3% (Nelson Marlborough) for Round 1 tests, and from 40.2% (Counties Manukau) to 71.9% (Nelson Marlborough) for Round 2 tests (Figure 115, Table 82). 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 121).

The proportion of eligible women with Round 1 historical tests ranged from 46.2% in Pacific women to 68.7% in European/ Other women (Figure 116, Table 83). For Round 2 tests, this proportion ranged from 35.5% in Pacific women to 57.5% 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 122, Table 84) or by ethnicity (Figure 123).

Trends

As this Indicator is reporting on the cumulative proportion of women who were eligible for HPV testing for the management of a historical high-grade squamous lesion as at 1 October 2009, the proportion is generally expected to increase over time. The proportion of eligible women with an HPV test recorded has increased since the previous report from 64.9% to 66.5% for Round 1 tests, and from 52.1% to 54.8% for Round 2 tests. It has also done so in every DHB (Figure 117), ethnicity (Figure 118) and age group (Figure 119) between this and the previous report.

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 programmes planned transition to primary HPV screening, as indicators will be reviewed as part of the transition process.

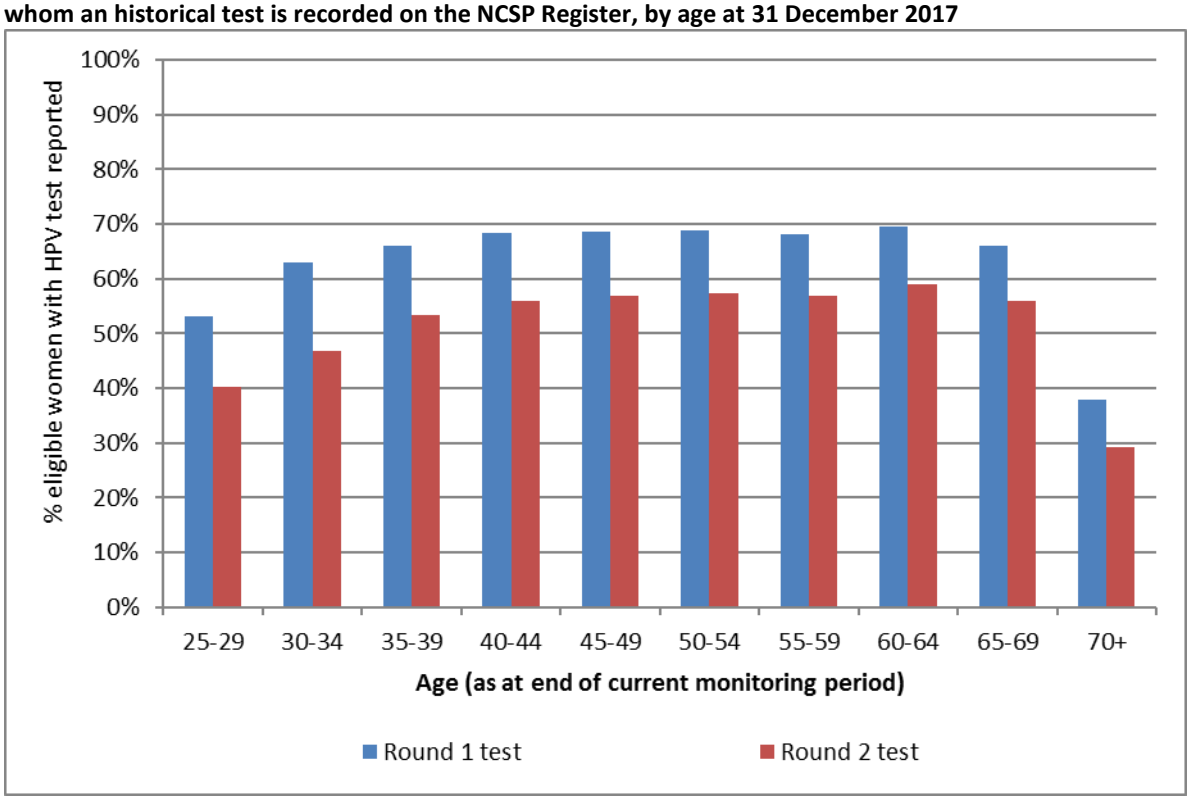
Planned future refinements include reporting on the proportion of the Round 1 and Round 2 historical tests where hrHPV was detected, and on how many women are able to be returned to routine screening after two rounds of negative cytology and hrHPV tests; considering women with a historical high-grade 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 114 - 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 2017



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 115 - 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 2017

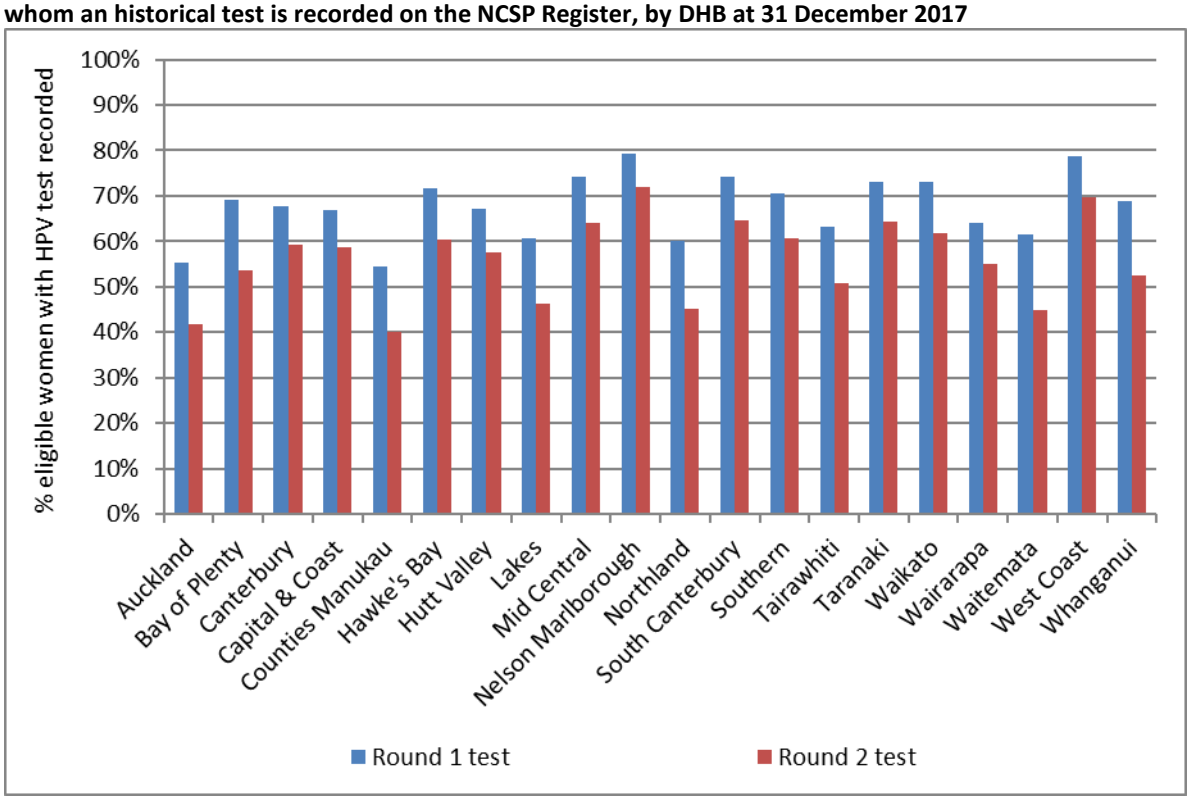


Figure 116 - Proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom an historical test is recorded on the NCSP Register, by ethnicity at 31 December 2017

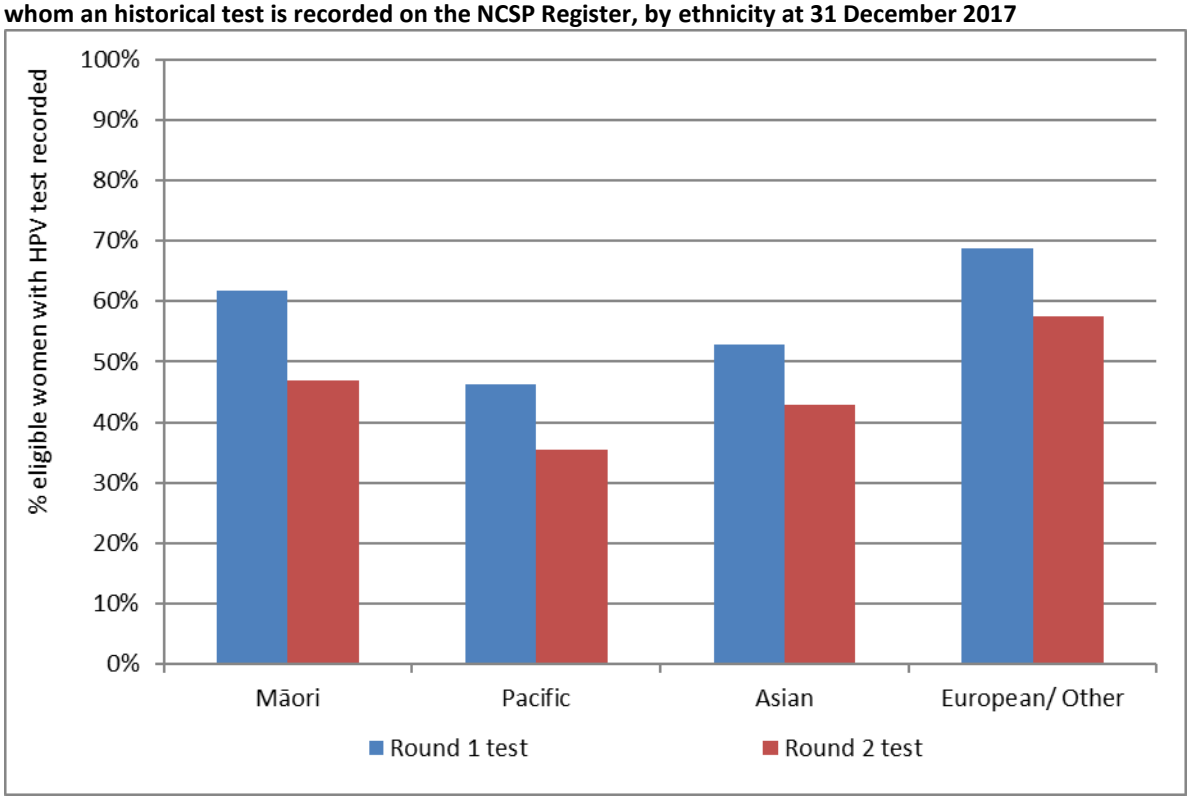


Figure 117 – Trends in the proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by DHB

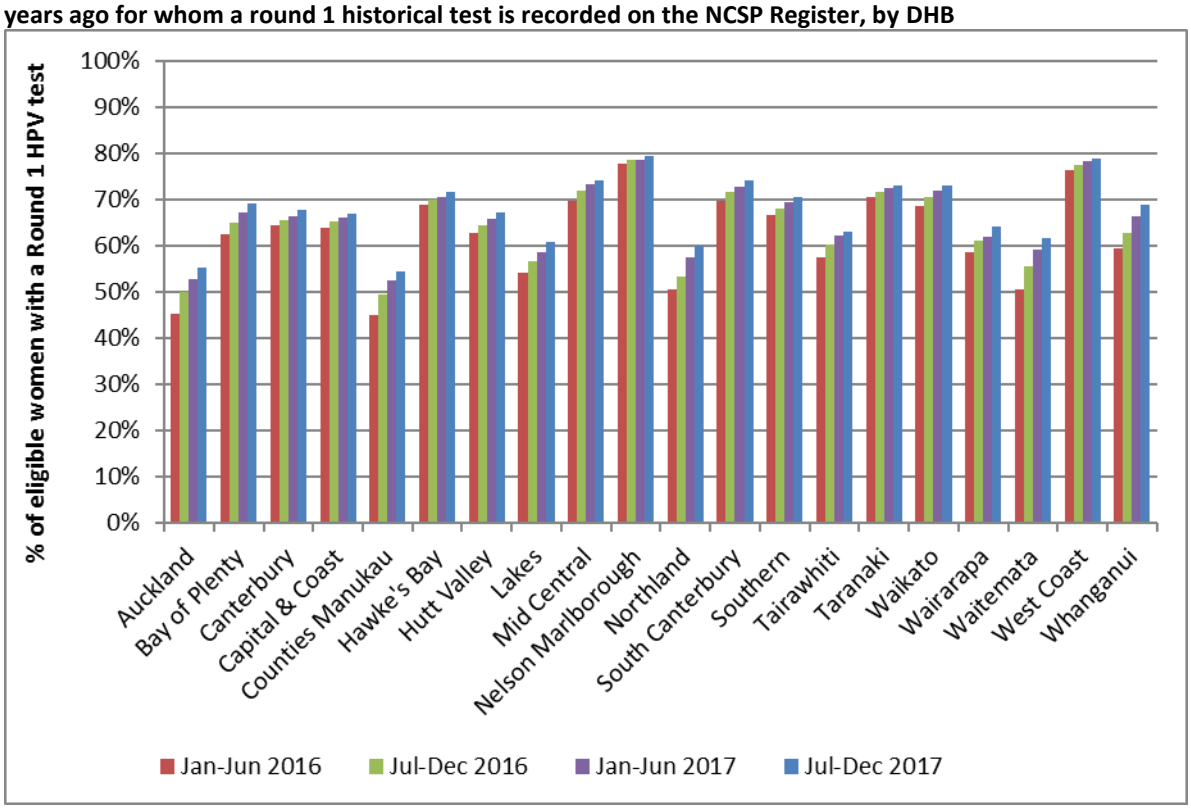


Figure 118 - Trends in the proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by ethnicity

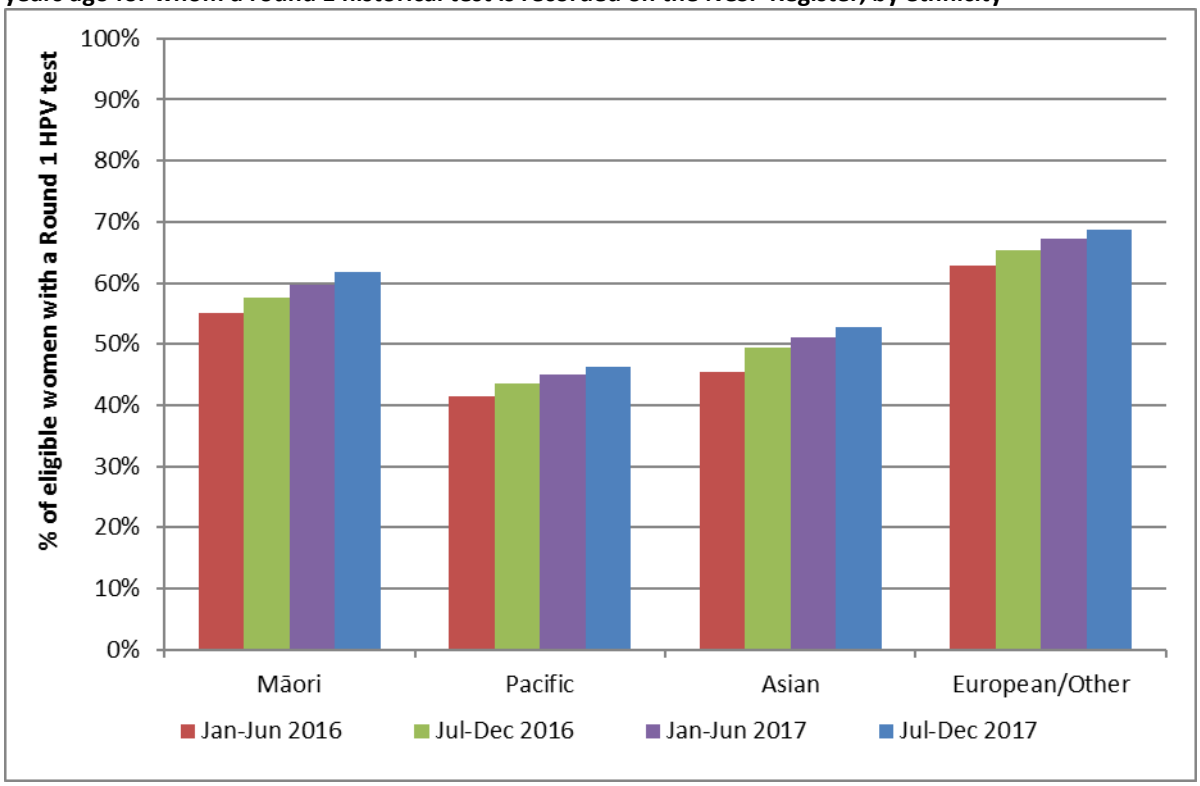
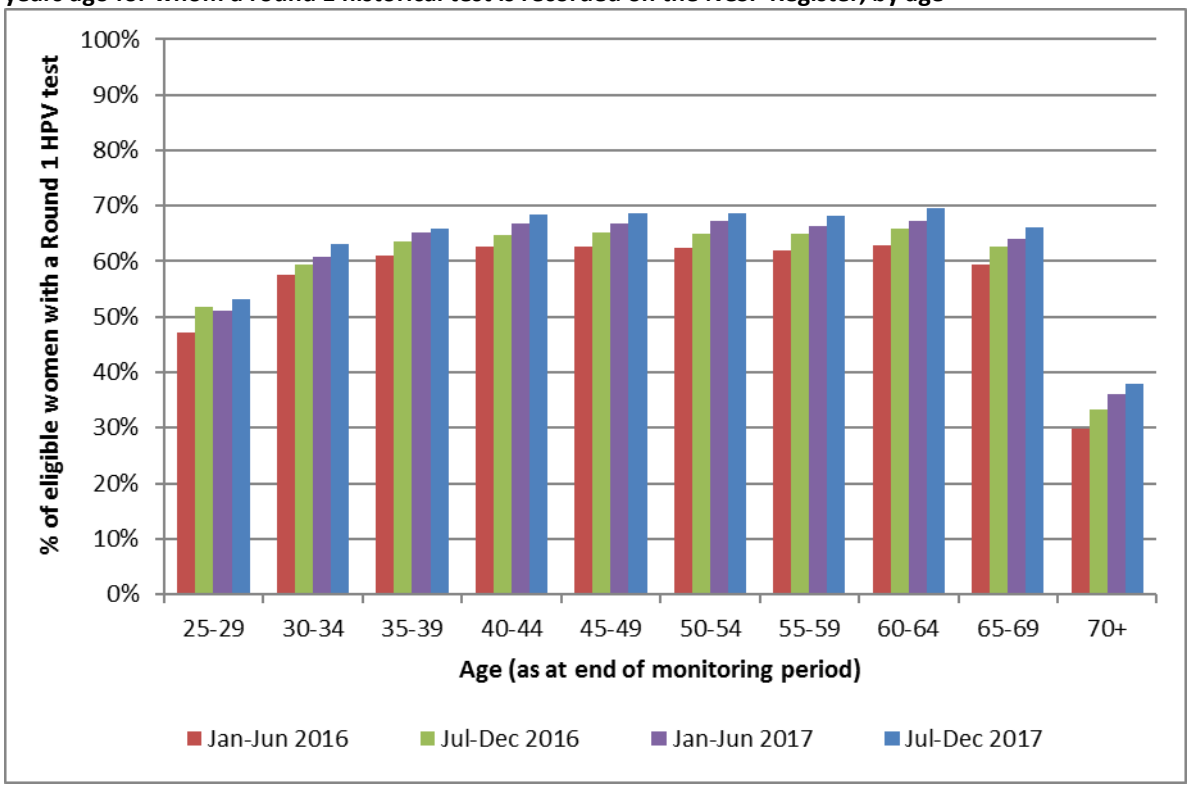


Figure 119 - Trends in the proportion of eligible women with squamous high-grade abnormality more than 3 years ago for whom a round 1 historical test is recorded on the NCSP Register, by age



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 - Coverage by DHB (women 25-69 years screened in the three years prior to 31 December 2017, hysterectomy adjusted)

DHB	Hysterectomy adjusted population	Women screened in the last 3 years	
	N	N	%
Auckland	149,593	105,602	70.6
Bay of Plenty	58,551	47,021	80.3
Canterbury	141,324	104,135	73.7
Capital & Coast	83,088	65,061	78.3
Counties Manukau	140,715	100,964	71.8
Hawke's Bay	40,693	31,050	76.3
Hutt Valley	38,661	29,390	76.0
Lakes	27,275	20,993	77.0
Mid Central	43,255	31,984	73.9
Nelson Marlborough	38,181	30,708	80.4
Northland	43,057	30,920	71.8
South Canterbury	14,977	11,524	76.9
Southern	80,154	62,883	78.5
Tairawhiti	11,924	9,042	75.8
Taranaki	29,918	24,230	81.0
Waikato	101,865	77,040	75.6
Wairarapa	11,037	8,303	75.2
Waitemata	163,147	119,816	73.4
West Coast	8,395	6,321	75.3
Whanganui	15,349	11,530	75.1
Total	**1,241,159**	**928,517**	**74.8**

Excludes 1 women for whom DHB could not be determined

Table 24 - Coverage by ethnicity (women 25-69 years screened in the three years prior to 31 December 2017, hysterectomy adjusted)

Ethnicity	Hysterectomy adjusted population (ages 25-69 years)	Women screened in the last 3 years (ages 25-69 years)	
		N	%
Māori	167,479	103,896	62.0
Pacific	69,397	50,971	73.4
Asian	198,974	126,189	63.4
European/ Other	805,309	647,462	80.4
Total	**1,241,159**	**928,518**	**74.8**

Table 25 - Coverage by age (women 20-69 years screened in the three years prior to 31 December 2017, hysterectomy adjusted)

Age	Hysterectomy adjusted population	Women screened in the last 3 years	
	N	N	%
20-24	167,892	79,724	47.5
25-29	179,494	109,086	60.8
30-34	160,065	111,164	69.4
35-39	145,084	110,405	76.1
40-44	141,825	111,615	78.7
45-49	151,419	121,840	80.5
50-54	140,568	111,699	79.5
55-59	131,436	104,313	79.4
60-64	105,608	83,504	79.1
65-69	85,660	64,892	75.8
20-69	**1,409,051**	**1,008,242**	**71.6**

Table 26 - Coverage by DHB (women aged 25-69 years screened in the five years prior to 31 December 2017, hysterectomy adjusted)

DHB	Hysterectomy adjusted population	Women screened in the last 5 years	
	N	N	%
Auckland	149,593	125,301	83.8
Bay of Plenty	58,551	54,671	93.4
Canterbury	141,324	123,604	87.5
Capital & Coast	83,088	77,535	93.3
Counties Manukau	140,715	121,001	86.0
Hawke's Bay	40,693	37,047	91.0
Hutt Valley	38,661	35,317	91.4
Lakes	27,275	24,996	91.6
Mid Central	43,255	38,029	87.9
Nelson Marlborough	38,181	35,923	94.1
Northland	43,057	37,482	87.1
South Canterbury	14,977	13,310	88.9
Southern	80,154	74,350	92.8
Tairawhiti	11,924	10,726	90.0
Taranaki	29,918	28,072	93.8
Waikato	101,865	89,658	88.0
Wairarapa	11,037	9,950	90.2
Waitemata	163,147	141,671	86.8
West Coast	8,395	7,413	88.3
Whanganui	15,349	13,778	89.8
Total	**1,241,159**	**1,099,834**	**88.6**

Excludes 3 women for whom DHB could not be determined

Table 27 - Coverage by ethnicity – women aged 25-69 years screened in the five years prior to 31 December 2017, hysterectomy adjusted

Ethnicity	Hysterectomy adjusted population	Women screened in the last 5 years	
	N	N	%
Māori	167,479	128,853	76.9
Pacific	69,397	64,214	92.5
Asian	198,974	146,621	73.7
European/ Other	805,309	760,149	94.4
Total	**1,241,159**	**1,099,837**	**88.6**

Table 28 - Coverage by age (women 20-69 years screened in the five years prior to 31 December 2017, hysterectomy adjusted)

Age	Hysterectomy adjusted population	Women screened in the last 5 years	
		N	%
20-24	167,892	84,689	50.4
25-29	179,494	132,546	73.8
30-34	160,065	133,588	83.5
35-39	145,084	130,920	90.2
40-44	141,825	131,978	93.1
45-49	151,419	144,023	95.1
50-54	140,568	131,766	93.7
55-59	131,436	121,908	92.8
60-64	105,608	97,030	91.9
65-69	85,660	76,078	88.8
20-69	**1,409,051**	**1,184,526**	**84.1**

Table 29 - Women aged 25-69 years screened in the five years prior to 31 December 2017, by ethnicity and DHB (hysterectomy adjusted)

	Māori		Pacific		Asian		European/ Other	
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Auckland	7,064	67.6	12,323	93.7	34,470	66.8	71,444	96.1
Bay of Plenty	10,208	80.0	703	84.6	2,931	67.1	40,829	100.6
Canterbury	6,795	64.7	2,732	96.6	11,464	75.9	102,613	90.9
Capital & Coast	6,066	72.6	4,360	86.4	9,603	74.4	57,506	101.3
Counties Manukau	15,067	76.4	25,346	96.5	30,893	77.5	49,695	90.5
Hawke's Bay	8,399	90.3	1,095	96.6	1,559	75.2	25,994	92.2
Hutt Valley	4,688	82.7	2,290	88.6	4,287	89.7	24,052	93.8
Lakes	7,368	85.9	523	96.5	1,541	75.2	15,564	96.6
Mid Central	6,103	82.1	913	91.8	2,437	70.0	28,576	91.2
Nelson Marlborough	2,703	81.0	435	92.6	1,482	78.2	31,303	96.4
Northland	10,579	79.6	507	68.7	1,335	69.5	25,061	92.4
South Canterbury	676	64.1	128	108.5	477	75.4	12,029	91.3
Southern	4,624	69.2	1,151	97.2	3,476	65.5	65,099	97.2
Tairawhiti	4,821	84.6	204	83.3	268	75.9	5,433	96.5
Taranaki	3,871	83.0	251	89.6	1,154	71.6	22,796	97.6
Waikato	15,435	76.0	2,158	84.8	7,851	76.3	64,214	93.4
Wairarapa	1,434	86.8	178	109.2	259	71.2	8,079	91.2
Waitemata	9,145	68.2	8,603	87.0	30,473	77.3	93,450	93.0
West Coast	682	77.0	64	71.9	225	58.1	6,442	91.6
Whanganui	3,125	84.0	250	79.4	436	78.8	9,967	92.6
NZ Overall	**128,853**	**76.9**	**64,214**	**92.5**	**146,621**	**73.7**	**760,146**	**94.4**

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 30 - Women under 20 years of age, and aged 15-19 years, screened in the three years prior to 31 December 2017, by DHB.

DHB	Number of women screened in last 3 years aged 10-20 years	aged 15-19 years	% of population aged 15-19 years screened
Auckland	481	481	3.1
Bay of Plenty	246	246	3.6
Canterbury	1,056	1,055	6.0
Capital & Coast	474	474	4.4
Counties Manukau	421	419	2.2
Hawke's Bay	171	171	3.3
Hutt Valley	152	151	3.3
Lakes	89	86	2.5
Mid Central	158	158	2.6
Nelson Marlborough	144	144	3.6
Northland	130	129	2.5
South Canterbury	78	78	4.9
Southern	518	518	4.4
Tairawhiti	31	31	2.0
Taranaki	158	158	4.5
Waikato	422	422	3.1
Wairarapa	54	54	4.4
Waitemata	790	788	4.1
West Coast	46	46	5.8
Whanganui	63	63	3.4
Unspecified	-	-	-
Total	**5,682**	**5,672**	**3.7**

Table 31 - Women screened under 20 years of age, as a proportion of all women screened in the three years to 31 December 2017, by DHB

DHB	Women screened in last 3 years aged < 20 years	all ages	Proportion of women screened who were aged < 20 years (%)
Auckland	481	116,541	0.4
Bay of Plenty	246	52,134	0.5
Canterbury	1,056	117,367	0.9
Capital & Coast	474	74,080	0.6
Counties Manukau	421	111,434	0.4
Hawke's Bay	171	34,499	0.5
Hutt Valley	152	32,354	0.5
Lakes	89	23,167	0.4
Mid Central	158	36,217	0.4
Nelson Marlborough	144	33,735	0.4
Northland	130	34,215	0.4
South Canterbury	78	12,839	0.6
Southern	518	72,067	0.7
Tairawhiti	31	10,066	0.3
Taranaki	158	26,941	0.6
Waikato	422	86,800	0.5
Wairarapa	54	9,278	0.6
Waitemata	790	132,387	0.6
West Coast	46	7,013	0.7
Whanganui	63	12,896	0.5
Unspecified	-	-	-
Total	**5,682**	**1,036,030**	**0.5**

Table 32 - Women screened under 20 years of age, and women aged 18-19 years when they were screened, in the three years to 31 December 2017, by DHB

	Number of women screened in last 3 years		
DHB	**aged 10-19 years**	**aged 18-19 years**	**% aged 18-19 years**
Auckland	481	450	93.6
Bay of Plenty	246	226	91.9
Canterbury	1,056	928	87.9
Capital & Coast	474	449	94.7
Counties Manukau	421	368	87.4
Hawke's Bay	171	157	91.8
Hutt Valley	152	135	88.8
Lakes	89	75	84.3
Mid Central	158	149	94.3
Nelson Marlborough	144	126	87.5
Northland	130	114	87.7
South Canterbury	78	65	83.3
Southern	518	466	90.0
Tairawhiti	31	26	83.9
Taranaki	158	142	89.9
Waikato	422	394	93.4
Wairarapa	54	47	87.0
Waitemata	790	683	86.5
West Coast	46	39	84.8
Whanganui	63	56	88.9
Unspecified	-	-	-
Total	**5,682**	**5,095**	**89.7**

Table 33 - Women (25-69 years) screened in the three years to 31 December 2017, as a percentage of the i) hysterectomy-adjustment NZ female population and ii) total NZ female population, by DHB

DHB	Women screened in the last 3 years (hysterectomy-adjusted)	Women screened in the last 3 years (no hysterectomy adjustment)
Auckland	70.6	64.1
Bay of Plenty	80.3	70.6
Canterbury	73.7	65.4
Capital & Coast	78.3	70.2
Counties Manukau	71.8	64.4
Hawke's Bay	76.3	66.8
Hutt Valley	76.0	67.6
Lakes	77.0	68.0
Mid Central	73.9	65.3
Nelson Marlborough	80.4	70.0
Northland	71.8	62.7
South Canterbury	76.9	67.1
Southern	78.5	69.3
Tairawhiti	75.8	67.0
Taranaki	81.0	71.5
Waikato	75.6	67.1
Wairarapa	75.2	65.5
Waitemata	73.4	65.7
West Coast	75.3	66.0
Whanganui	75.1	65.7
Total	**74.8**	**66.5**

Table 34 - 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 2016	To 31 Dec 2016	T0 30 Jun 2017	To 31 Dec 2017
Auckland	78.8%	78.5%	77.4%	70.6%
Bay of Plenty	80.5%	81.3%	81.1%	80.3%
Canterbury	74.4%	74.6%	74.5%	73.7%
Capital & Coast	80.5%	80.1%	79.3%	78.3%
Counties Manukau	74.2%	74.0%	73.2%	71.8%
Hawke's Bay	76.4%	75.7%	75.9%	76.3%
Hutt Valley	77.5%	77.7%	76.7%	76.0%
Lakes	78.4%	78.5%	78.1%	77.0%
Mid Central	74.7%	75.1%	74.9%	73.9%
Nelson Marlborough	80.2%	79.9%	80.0%	80.4%
Northland	72.4%	73.0%	73.0%	71.8%
South Canterbury	76.5%	77.0%	76.2%	76.9%
Southern	79.2%	79.6%	79.9%	78.5%
Tairawhiti	72.8%	73.7%	74.3%	75.8%
Taranaki	79.1%	79.3%	78.9%	81.0%
Waikato	75.3%	76.2%	76.5%	75.6%
Wairarapa	73.6%	73.6%	73.6%	75.2%
Waitemata	76.1%	75.9%	75.2%	73.4%
West Coast	73.0%	72.3%	71.1%	75.3%
Whanganui	75.6%	75.8%	74.8%	75.1%
Total	**76.7%**	**76.8%**	**76.4%**	**74.8%**

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 Dec 2017. Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.

Table 35 - 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 2016	To 31 Dec 2016	T0 30 Jun 2017	To 31 Dec 2017
20-24	52.1%	51.0%	50.3%	47.5%
25-29	65.8%	65.5%	65.0%	60.8%
30-34	72.5%	72.5%	72.1%	69.4%
35-39	77.8%	78.0%	77.8%	76.1%
40-44	79.8%	79.9%	79.9%	78.7%
45-49	81.3%	81.4%	81.0%	80.5%
50-54	80.5%	80.7%	80.1%	79.5%
55-59	80.0%	80.1%	79.6%	79.4%
60-64	79.5%	79.9%	79.3%	79.1%
65-69	75.2%	75.5%	75.2%	75.8%
Total	**73.8%**	**73.7%**	**73.3%**	**71.6%**

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 Dec 2017. Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.

Table 36 - 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 2016	To 31 Dec 2016	T0 30 Jun 2017	To 31 Dec 2017
Māori	63.6%	64.1%	64.0%	62.0%
Pacific	75.5%	75.1%	74.3%	73.4%
Asian	65.5%	66.6%	67.2%	63.4%
European/ Other	81.9%	81.7%	81.1%	80.4%
Total	**76.7%**	**76.8%**	**76.4%**	**74.8%**

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 Dec 2017. Original population projection estimates were used to calculate coverage for 30 June 2017 and prior.

Indicator 1.2 – Regularity of screening

Table 37 - Routine (3-yearly) repeat screening interval (number of cytology tests), by ethnicity, 2013-2017

	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 2013	971	2,452	1,508	359	1,094	648	1,105	2,612	910	8,151	22,940	7,966
Apr-Jun 2013	1,064	2,703	1,639	397	1,232	679	1,240	2,971	1,026	8,809	25,605	8,757
Jul-Sep 2013	991	2,781	1,645	374	1,439	776	1,142	3,355	1,072	8,266	26,826	8,699
Oct-Dec 2013	795	2,548	1,623	303	1,215	651	976	2,799	967	7,513	24,589	8,300
Jan-Mar 2014	993	2,738	1,622	329	1,211	795	1,071	2,993	1,042	7,691	24,086	8,775
Apr-Jun 2014	929	2,994	1,731	342	1,304	774	1,208	3,296	1,029	8,005	25,883	8,838
Jul-Sep 2014	986	3,098	1,712	307	1,441	773	1,043	3,696	1,131	7,528	27,845	8,694
Oct-Dec 2014	840	2,932	1,669	330	1,398	800	961	3,203	1,034	6,972	26,741	8,078
Jan-Mar 2015	958	2,798	1,805	312	1,314	821	1,062	3,294	1,194	7,583	26,388	9,161
Apr-Jun 2015	957	3,161	2,005	315	1,536	989	1,137	3,843	1,422	7,763	28,617	9,950
Jul-Sep 2015	862	3,482	2,022	318	1,519	847	1,017	3,765	1,134	7,065	29,335	9,094
Oct-Dec 2015	841	3,233	1,871	333	1,494	923	930	3,574	1,150	6,783	27,888	9,175
Jan-Mar 2016	933	2,978	1,869	315	1,396	1,002	1,025	3,540	1,202	7,177	26,654	9,143
Apr-Jun 2016	885	3,242	2,108	313	1,552	1,072	1,028	4,035	1,366	7,027	28,466	9,640
Jul-Sep 2016	777	3,271	2,001	279	1,523	849	972	4,336	1,230	6,327	29,355	9,260
Oct-Dec 2016	656	2,786	1,737	225	1,318	724	783	3,461	1,137	5,698	25,733	8,491
Jan-Mar 2017	819	2,979	1,890	293	1,365	860	922	3,774	1,327	6,544	26,784	9,700
Apr-Jun 2017	782	3,302	2,016	278	1,479	911	949	4,159	1,464	6,122	27,857	9,840
Jul-Sep 2017	738	3,389	2,074	256	1,463	931	924	4,525	1,502	5,670	28,492	9,723
Oct-Dec 2017	605	3,106	2,057	240	1,330	811	735	3,978	1,376	5,128	27,153	9,469

Table 38 - Routine (3-yearly) repeat screening interval (number of cytology tests), by age, 2013-2017

	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 2013	1,932	2,719	1,318	2,434	5,685	3,180	2,858	7,874	3,088	2,269	7,493	2,295	1,093	5,327	1,151
Apr-Jun 2013	1,833	2,839	1,225	2,590	6,071	3,355	3,315	8,989	3,552	2,584	8,418	2,586	1,188	6,194	1,383
Jul-Sep 2013	1,804	3,010	1,279	2,367	6,370	3,284	3,007	9,566	3,554	2,443	9,100	2,693	1,152	6,355	1,382
Oct-Dec 2013	1,522	2,615	1,295	2,116	5,611	3,111	2,674	8,480	3,209	2,201	8,394	2,580	1,074	6,051	1,346
Jan-Mar 2014	1,773	2,926	1,322	2,352	5,864	3,390	2,740	8,477	3,394	2,146	8,115	2,613	1,073	5,646	1,515
Apr-Jun 2014	1,747	2,929	1,291	2,423	6,271	3,305	2,864	9,032	3,567	2,309	8,952	2,751	1,141	6,293	1,458
Jul-Sep 2014	1,708	3,005	1,308	2,165	6,486	3,370	2,727	9,830	3,487	2,173	9,864	2,714	1,091	6,895	1,431
Oct-Dec 2014	1,521	2,793	1,178	1,981	6,019	3,212	2,519	9,210	3,301	2,032	9,450	2,505	1,050	6,802	1,385
Jan-Mar 2015	1,834	3,052	1,380	2,289	6,346	3,591	2,572	9,022	3,698	2,152	8,959	2,828	1,068	6,415	1,484
Apr-Jun 2015	1,708	3,156	1,415	2,379	6,776	3,845	2,720	10,003	4,130	2,239	9,982	3,151	1,126	7,240	1,825
Jul-Sep 2015	1,515	3,244	1,344	2,134	6,939	3,617	2,496	10,216	3,730	2,060	10,464	2,912	1,057	7,238	1,494
Oct-Dec 2015	1,447	3,230	1,368	1,932	6,365	3,523	2,418	9,677	3,724	2,055	9,710	2,977	1,035	7,207	1,527
Jan-Mar 2016	1,804	3,234	1,412	2,296	6,802	3,700	2,393	9,047	3,731	1,957	8,997	2,822	1,000	6,488	1,551
Apr-Jun 2016	1,570	3,324	1,454	2,198	6,801	3,767	2,467	9,684	4,015	2,029	9,964	3,217	989	7,522	1,733
Jul-Sep 2016	1,395	3,268	1,349	1,910	7,001	3,599	2,166	10,103	3,828	1,905	10,472	2,933	979	7,641	1,631
Oct-Dec 2016	1,202	2,845	1,219	1,617	5,950	3,209	1,957	8,544	3,303	1,704	9,065	2,758	882	6,894	1,600
Jan-Mar 2017	1,555	3,263	1,447	1,968	6,584	3,689	2,227	9,013	3,829	1,910	9,255	3,014	918	6,787	1,798
Apr-Jun 2017	1,383	3,319	1,444	1,852	6,818	3,697	2,174	9,433	3,952	1,790	9,921	3,242	932	7,306	1,896
Jul-Sep 2017	1,183	3,360	1,464	1,857	6,953	3,752	1,982	9,773	3,848	1,684	10,317	3,297	882	7,466	1,869
Oct-Dec 2017	1,056	3,119	1,373	1,432	6,333	3,651	1,812	8,955	3,776	1,584	9,628	3,127	824	7,532	1,786

Table 39 - 12 month repeat screening interval (number of cytology tests), by ethnicity, 2013-2017

	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 2013	161	1,464	2,503	60	537	1,056	110	1,301	1,573	875	9,856	10,512
Apr-Jun 2013	139	1,496	2,594	48	563	1,207	115	1,445	1,771	862	10,660	11,086
Jul-Sep 2013	130	1,552	2,651	44	639	1,228	99	1,691	1,707	735	10,542	11,142
Oct-Dec 2013	117	1,459	2,410	25	537	1,054	84	1,347	1,640	701	9,806	10,283
Jan-Mar 2014	172	1,359	2,555	55	498	1,193	98	1,370	1,654	776	8,977	10,599
Apr-Jun 2014	148	1,375	2,586	39	564	1,092	98	1,473	1,685	757	9,334	10,086
Jul-Sep 2014	100	1,443	2,469	31	553	1,037	80	1,745	1,705	648	9,527	10,263
Oct-Dec 2014	101	1,251	2,500	35	510	1,125	82	1,387	1,701	620	8,774	9,724
Jan-Mar 2015	120	1,236	2,667	35	479	1,170	120	1,367	1,933	773	8,452	10,617
Apr-Jun 2015	111	1,327	2,633	41	521	1,282	111	1,530	2,083	699	8,615	10,362
Jul-Sep 2015	106	1,421	2,676	35	557	1,108	70	1,499	1,911	582	8,916	9,822
Oct-Dec 2015	108	1,305	2,685	31	573	1,297	77	1,437	1,851	560	8,480	9,522
Jan-Mar 2016	122	1,283	2,670	39	543	1,287	89	1,448	1,857	668	7,942	9,923
Apr-Jun 2016	122	1,383	2,582	41	607	1,249	103	1,526	1,946	616	8,467	9,458
Jul-Sep 2016	72	1,286	2,496	22	588	1,134	62	1,690	1,991	511	8,199	9,338
Oct-Dec 2016	71	1,159	2,259	27	473	954	53	1,397	1,725	441	7,392	8,438
Jan-Mar 2017	91	1,192	2,216	34	520	998	81	1,455	1,978	515	7,337	9,236
Apr-Jun 2017	76	1,192	2,400	28	488	1,066	77	1,575	2,042	462	7,255	8,756
Jul-Sep 2017	58	1,175	2,524	18	487	1,126	66	1,649	2,204	374	7,203	8,894
Oct-Dec 2017	57	1,008	2,475	18	373	971	59	1,426	1,973	354	6,425	8,542

Table 40 - 12 month repeat screening interval (number of cytology tests), by age, 2013-2017

	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 2013	490	4,087	4,587	257	2,768	4,224	243	2,829	3,662	138	2,253	2,142	78	1,221	1,029
Apr-Jun 2013	454	4,197	4,745	280	3,004	4,354	213	3,129	3,926	142	2,447	2,522	75	1,387	1,111
Jul-Sep 2013	395	4,350	5,031	239	2,895	4,375	186	3,169	3,852	127	2,541	2,419	61	1,469	1,051
Oct-Dec 2013	326	4,028	4,568	217	2,595	3,883	176	2,863	3,587	141	2,274	2,303	67	1,389	1,046
Jan-Mar 2014	467	3,974	4,867	253	2,505	4,120	194	2,548	3,540	124	2,023	2,353	63	1,154	1,121
Apr-Jun 2014	459	4,041	4,530	217	2,630	4,018	157	2,769	3,463	128	2,062	2,284	81	1,244	1,154
Jul-Sep 2014	330	4,296	4,756	204	2,677	4,016	160	2,749	3,478	109	2,251	2,172	56	1,295	1,052
Oct-Dec 2014	336	3,958	4,548	166	2,352	3,842	151	2,325	3,309	109	2,072	2,262	76	1,215	1,089
Jan-Mar 2015	457	4,096	5,097	239	2,329	4,198	153	2,189	3,626	129	1,785	2,320	70	1,135	1,146
Apr-Jun 2015	398	4,103	4,828	220	2,488	4,135	170	2,351	3,652	106	1,876	2,508	68	1,175	1,237
Jul-Sep 2015	326	4,276	4,867	170	2,550	3,925	129	2,376	3,393	107	2,013	2,291	61	1,178	1,041
Oct-Dec 2015	341	4,134	4,727	160	2,298	4,018	120	2,267	3,219	101	1,915	2,279	54	1,181	1,112
Jan-Mar 2016	406	4,065	5,075	206	2,316	4,098	144	2,102	3,254	100	1,664	2,224	62	1,069	1,086
Apr-Jun 2016	385	4,186	4,643	184	2,481	4,012	154	2,314	3,183	104	1,792	2,231	55	1,210	1,166
Jul-Sep 2016	257	4,138	4,577	178	2,455	3,995	117	2,233	3,232	76	1,786	2,119	39	1,151	1,036
Oct-Dec 2016	223	3,691	4,089	149	2,178	3,491	105	1,919	2,830	69	1,597	1,968	46	1,036	998
Jan-Mar 2017	301	3,979	4,543	167	2,300	3,698	124	1,867	3,032	86	1,435	2,046	43	923	1,109
Apr-Jun 2017	265	3,899	4,456	157	2,285	3,775	114	1,796	2,792	69	1,506	2,113	38	1,024	1,128
Jul-Sep 2017	208	3,910	4,666	131	2,303	3,914	90	1,895	3,014	56	1,453	2,078	31	953	1,076
Oct-Dec 2017	195	3,538	4,504	117	1,957	3,585	90	1,563	2,736	47	1,334	2,022	39	840	1,114

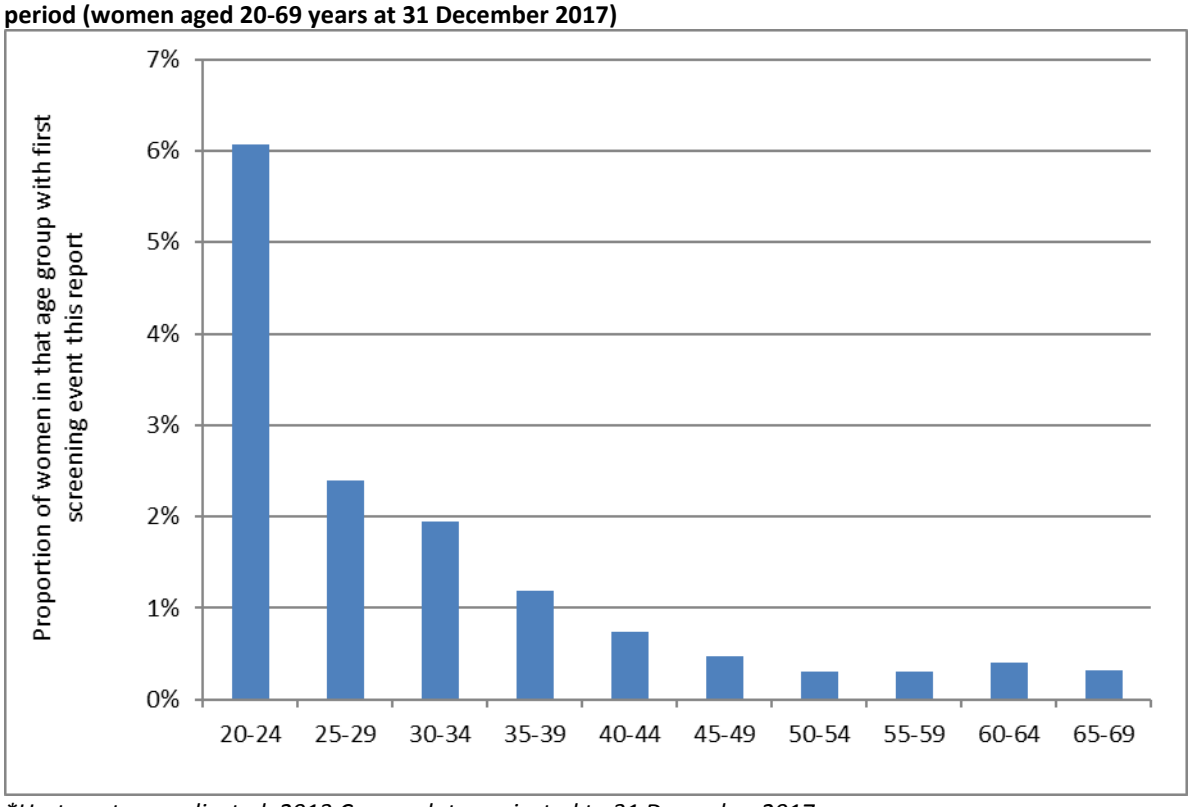
Indicator 2 – First screening events

Table 41 - Age distribution of first screening events for period 31 December 2017

Age	Women with first events	% of first events (ages 20-69 yrs) which occurred in that age group
20-24	10,192	45.1
25-29	4,304	19.0
30-34	3,105	13.7
35-39	1,717	7.6
40-44	1,042	4.6
45-49	717	3.2
50-54	436	1.9
55-59	410	1.8
60-64	422	1.9
65-69	273	1.2
20-69 yrs	**22,618**	**100.0**

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

Figure 120 - Proportion of population* in that age group with their first screening event during the monitoring period (women aged 20-69 years at 31 December 2017)



**Hysterectomy adjusted, 2013 Census data projected to 31 December 2017.*

Table 42 - Women (aged 20-69 years) with first screening events as a proportion of i) total number of women with screening events, and ii) eligible women, by DHB, for period 1 January – 31 December 2017

DHB	Women with first events N	As a proportion of women with a screening event		As a proportion of eligible population	
		N	%	N	%
Auckland	3,332	23,135	14.4	174,951	1.9
Bay of Plenty	805	10,768	7.5	64,560	1.2
Canterbury	2,610	23,571	11.1	160,389	1.6
Capital & Coast	1,915	14,755	13.0	96,965	2.0
Counties Manukau	2,888	21,375	13.5	161,937	1.8
Hawke's Bay	488	6,461	7.6	44,758	1.1
Hutt Valley	568	6,223	9.1	42,941	1.3
Lakes	439	4,544	9.7	30,335	1.4
Mid Central	667	7,498	8.9	49,728	1.3
Nelson Marlborough	526	6,411	8.2	41,181	1.3
Northland	529	6,387	8.3	47,353	1.1
South Canterbury	204	2,490	8.2	16,292	1.3
Southern	1,671	14,266	11.7	92,965	1.8
Tairawhiti	169	2,101	8.0	13,249	1.3
Taranaki	372	5,418	6.9	32,768	1.1
Waikato	1,891	17,378	10.9	115,792	1.6
Wairarapa	133	1,765	7.5	12,071	1.1
Waitemata	3,087	26,720	11.6	184,778	1.7
West Coast	90	1,357	6.6	9,119	1.0
Whanganui	234	2,759	8.5	16,919	1.4
Total	**22,618**	**205,382**	**11.0**	**1,409,051**	**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 2017 for that DHB, as a percent. Total women screened and women with first events exclude those for whom DHB could not be ascertained.

Table 43 - 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 31 December 2017

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	2,433	24,035	10.1	199,908	1.2
Pacific	1,600	10,559	15.2	83,708	1.9
Asian	6,486	28,911	22.4	233,374	2.8
European/ Other	12,099	141,877	8.5	892,061	1.4
Total	**22,618**	**205,382**	**11.0**	**1,409,051**	**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 2017 for that ethnicity group, as a percent.

Table 44 - Median age of women with a first screening event, by ethnicity, for period 31 December 2017

Ethnic Group	Median Age	Mean Age
Māori	21	*24.6*
Pacific	25	*29.0*
Asian	31	*34.0*
European/ Other	23	*27.7*

Indicator 3 – Withdrawal rates

Table 45 - Number of women who withdrew from the NCSP Register 1 July – 31 December 2017 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	822	-	0
20-24	74,590	4	0.005
25-29	144,662	3	0.002
30-34	167,412	1	0.001
35-39	177,778	-	0.000
40-44	186,398	4	0.002
45-49	204,774	1	0.000
50-54	191,018	4	0.002
55-59	179,334	2	0.001
60-64	145,949	1	0.001
65-69	118,922	-	0.000
70+	267,006	-	0.000
Total (all ages)	**1,858,665**	**20**	**0.001**
Total (20-69)	**1,590,837**	**20**	**0.001**

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

Table 46 - Number of women (aged 20-69 years) who withdrew from the NCSP Register 1 July - 31 December 2017 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	197,744	2	0.001
Pacific	100,789	2	0.002
Asian	191,694	3	0.002
European/ Other	1,100,610	13	0.001
Total	**1,590,837**	**20**	**0.001**

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

Indicator 4 – Early re-screening

Table 47 - Early re-screening by five-year age group

Age	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
20-24	1,195	183	15.3
25-29	4,379	653	14.9
30-34	4,669	656	14.1
35-39	5,337	702	13.2
40-44	5,723	738	12.9
45-49	6,420	849	13.2
50-54	5,980	756	12.6
55-59	5,361	648	12.1
60-64	4,407	447	10.1
65-69	3,346	263	7.9
All ages	**46,817**	**5,895**	**12.6**

Table 48 - Early re-screening by DHB

DHB	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
Auckland	5,258	794	15.1
Bay of Plenty	2,335	319	13.7
Canterbury	5,365	786	14.7
Capital & Coast	3,586	368	10.3
Counties Manukau	4,606	559	12.1
Hawke's Bay	1,617	169	10.5
Hutt Valley	1,466	134	9.1
Lakes	1,032	138	13.4
Mid Central	1,706	133	7.8
Nelson Marlborough	1,658	166	10.0
Northland	1,434	157	10.9
South Canterbury	554	66	11.9
Southern	3,301	392	11.9
Tairawhiti	369	24	6.5
Taranaki	1,152	113	9.8
Waikato	3,791	347	9.2
Wairarapa	420	73	17.4
Waitemata	6,257	1,071	17.1
West Coast	334	27	8.1
Whanganui	575	58	10.1
Unspecified	1	1	100.0
Total	**46,817**	**5,895**	**12.6**

Table 49 - Early re-screening by ethnicity

Ethnicity	Women recommended to return in 3 years	Women with >1 subsequent test	
		N	%
Māori	4,867	532	10.9
Pacific	2,215	217	9.8
Asian	5,435	653	12.0
European/ Other	34,300	4,493	13.1
Total	**46,817**	**5,895**	**12.6**

Indicator 5 – Laboratory indicators

Indicator 5.1 – Laboratory cytology reporting

Table 50 - 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	0.40%	0.43%
Canterbury Health Laboratories	0.71%	0.80%
LabPLUS	1.89%	2.08%
Medlab Central Ltd.	0.93%	0.97%
Pathlab	0.47%	0.49%
Southern Community Laboratories	0.73%	0.78%
Total	**0.70%**	**0.75%**

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

Indicator 5.2 – Accuracy of cytology predicting HSIL

Table 51 - 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	172	95.0	136	79.1	9	5.0	181
Canterbury Health Laboratories	96	95.0	78	81.3	5	5.0	101
LabPLUS	173	94.0	141	81.5	11	6.0	184
Medlab Central Ltd.	112	91.8	98	87.5	10	8.2	122
Pathlab	112	92.6	88	78.6	9	7.4	121
Southern Community Laboratories	750	90.9	596	79.5	75	9.1	825
Total	**1,415**	**92.2**	**1,137**	**80.4**	**119**	**7.8**	**1,534**

Target: 65% - 85%

Table 52 - 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	84	78.5	34	40.5	23	21.5	107
Canterbury Health Laboratories	135	91.8	72	53.3	12	8.2	147
LabPLUS	199	78.0	82	41.2	56	22.0	255
Medlab Central Ltd.	78	83.9	51	65.4	15	16.1	93
Pathlab	59	74.7	32	54.2	20	25.3	79
Southern Community Laboratories	167	81.5	78	46.7	38	18.5	205
Total	**722**	**81.5**	**349**	**48.3**	**164**	**18.5**	**886**

Table 53 - 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	256	88.9	170	66.4	32	11.1	288
Canterbury Health Laboratories	231	93.1	150	64.9	17	6.9	248
LabPLUS	372	84.7	223	59.9	67	15.3	439
Medlab Central Ltd.	190	88.4	149	78.4	25	11.6	215
Pathlab	171	85.5	120	70.2	29	14.5	200
Southern Community Laboratories	917	89.0	674	73.5	113	11.0	1,030
Total	**2,137**	**88.3**	**1,486**	**69.5**	**283**	**11.7**	**2,420**

Indicator 5.5 – Laboratory turnaround time

Table 54 - Timeliness of cytology reporting by laboratory, 31 December 2017

	Laboratory turnaround time - cytology								
	Within 7 days		8-15 days		Total within 15 days		More than 15 days		Total
Laboratory	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Anatomical Pathology Services	41,970	97.9	744	1.7	42,714	99.6	151	0.4	42,865
Canterbury Health Laboratories	9,326	94.1	519	5.2	9,845	99.4	62	0.6	9,907
LabPLUS	8,922	92.6	501	5.2	9,423	97.8	209	2.2	9,632
Medlab Central Ltd.	13,358	88.5	1,486	9.9	14,844	98.4	242	1.6	15,086
Pathlab	25,293	96.6	820	3.1	26,113	99.7	70	0.3	26,183
Southern Community Laboratories	101,101	97.3	1,947	1.9	103,048	99.2	845	0.8	103,893
Total	**199,970**	**96.3**	**6,017**	**2.9**	**205,987**	**99.2**	**1,579**	**0.8**	**207,566**

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 55 - Timeliness of histology reporting by laboratory, 31 December 2017

	Laboratory turnaround time - histology								
	Within 10 days		10-15 days		Total within 15 days		More than 15 days		Total
Laboratory	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Anatomical Pathology Services	1,403	98.8	10	0.7	1,413	99.5	7	0.5	1,420
Canterbury Health Laboratories	1,494	94.9	68	4.3	1,562	99.2	12	0.8	1,574
LabPLUS	625	76.6	108	13.2	733	89.8	83	10.2	816
Medlab Central Ltd.	876	94.6	15	1.6	891	96.2	35	3.8	926
Memorial Hospital Hastings Laboratory	75	88.2	7	8.2	82	96.5	3	3.5	85
Middlemore Hospital Laboratory	1,105	94.7	30	2.6	1,135	97.3	32	2.7	1,167
Nelson Hospital Laboratory	119	99.2	-	0.0	119	99.2	1	0.8	120
North Shore Hospital Laboratory	920	95.2	25	2.6	945	97.8	21	2.2	966
Northland Pathology Laboratory	211	77.6	34	12.5	245	90.1	27	9.9	272
Pathlab	918	85.2	75	7.0	993	92.2	84	7.8	1,077
Southern Community Laboratories Dunedin	2,680	99.5	5	0.2	2,685	99.7	9	0.3	2,694
Southern Community Laboratories Wellington	882	97.6	16	1.8	898	99.3	6	0.7	904
Taranaki Medlab	335	99.7	-	0.0	335	99.7	1	0.3	336
Waikato Hospital Laboratory	148	76.7	9	4.7	157	81.3	36	18.7	193
Total	**11,791**	**94.0**	**402**	**3.2**	**12,193**	**97.2**	**357**	**2.8**	**12,550**

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 56 - Timeliness of reporting for cytology with associated HPV testing by laboratory, 31 December 2017

	Laboratory turnaround time - cytology with HPV testing				
	Within 15 days		More than 15 days		Total
Laboratory	N	%	N	%	N
Anatomical Pathology Services	664	99.7	2	0.3	666
Canterbury Health Laboratories	161	98.2	3	1.8	164
LabPLUS	260	99.6	1	0.4	261
Medlab Central Ltd.	275	96.2	11	3.8	286
Pathlab	582	99.3	4	0.7	586
Southern Community Laboratories	811	99.3	6	0.7	817
Total	**2,753**	**99.0**	**27**	**1.0**	**2,780**

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

Table 57 - Women with a histology report within 90 days of a high-grade cytology report, by DHB and age

	<20		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70+		Total
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Auckland	1	100.0	22	75.9	39	75.0	23	79.3	19	90.5	6	100.0	15	83.3	7	58.3	2	50.0	1	50.0	2	28.6	4	50.0	141
Bay of Plenty	-	-	8	88.9	9	75.0	11	100.0	8	72.7	3	100.0	2	100.0	5	62.5	0	0.0	5	83.3	4	100.0	1	50.0	56
Canterbury	-	-	46	97.9	53	96.4	32	86.5	23	95.8	12	92.3	8	88.9	6	66.7	12	85.7	6	75.0	2	100.0	1	50.0	201
Capital & Coast	-	-	13	72.2	13	81.3	19	100.0	11	84.6	4	80.0	9	75.0	5	62.5	3	60.0	2	66.7	3	60.0	1	100.0	83
Counties Manukau	-	-	18	72.0	25	78.1	27	84.4	9	75.0	10	90.9	6	75.0	8	61.5	12	66.7	5	71.4	3	60.0	1	33.3	124
Hawke's Bay	-	-	13	92.9	8	80.0	9	100.0	8	66.7	4	80.0	4	100.0	5	71.4	4	66.7	1	100.0	1	33.3	1	20.0	58
Hutt Valley	-	-	6	100.0	11	91.7	6	100.0	3	100.0	3	100.0	2	100.0	4	100.0	2	100.0	3	100.0	0	0.0	0	0.0	40
Lakes	-	-	4	66.7	9	81.8	12	100.0	3	100.0	5	100.0	1	100.0	2	100.0	3	60.0	1	100.0	1	50.0	-	-	41
Mid Central	-	-	11	78.6	20	87.0	10	100.0	5	100.0	5	100.0	2	50.0	5	83.3	4	80.0	3	75.0	2	66.7	-	-	67
Nelson Marlborough	-	-	9	90.0	6	66.7	11	91.7	8	88.9	2	100.0	7	100.0	6	100.0	3	75.0	1	100.0	-	-	-	-	53
Northland	-	-	6	100.0	13	86.7	9	75.0	7	87.5	7	77.8	4	100.0	3	100.0	1	33.3	2	100.0	5	100.0	1	50.0	58
South Canterbury	-	-	2	100.0	11	84.6	3	100.0	1	100.0	1	100.0	0	0.0	1	50.0	1	100.0	-	-	-	-	-	-	20
Southern	2	100.0	18	90.0	20	87.0	26	96.3	16	100.0	10	100.0	12	92.3	7	87.5	5	100.0	3	100.0	3	75.0	4	80.0	126
Tairawhiti	-	-	6	85.7	10	83.3	2	50.0	3	100.0	3	100.0	-	-	1	100.0	1	50.0	-	-	-	-	-	-	26
Taranaki	-	-	7	87.5	10	83.3	10	83.3	5	100.0	4	80.0	8	100.0	1	25.0	1	100.0	-	-	1	100.0	-	-	47
Waikato	1	100.0	22	100.0	27	79.4	19	95.0	13	100.0	9	90.0	9	90.0	9	56.3	7	77.8	6	75.0	4	66.7	0	0.0	126
Wairarapa	-	-	0	0.0	1	100.0	2	100.0	6	100.0	-	-	2	100.0	1	50.0	-	-	2	100.0	-	-	3	100.0	17
Waitemata	-	-	19	76.0	36	92.3	26	83.9	22	88.0	9	90.0	6	85.7	4	80.0	7	58.3	4	66.7	3	42.9	-	-	136
West Coast	-	-	4	100.0	3	75.0	2	66.7	2	100.0	1	100.0	0	0.0	1	33.3	-	-	-	-	-	-	-	-	13
Whanganui	-	-	3	100.0	4	100.0	2	66.7	3	75.0	3	75.0	2	100.0	-	-	-	-	1	100.0	-	-	-	-	18
Total	**4**	**100.0**	**237**	**85.9**	**328**	**84.3**	**261**	**88.8**	**175**	**89.3**	**101**	**91.0**	**99**	**86.1**	**81**	**68.1**	**68**	**68.7**	**46**	**79.3**	**34**	**61.8**	**17**	**51.5**	**1,451**

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

Table 58 - 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	1	100.0	23	79.3	41	78.8	25	86.2	19	90.5	6	100.0	16	88.9	8	66.7	3	75.0	2	100.0	3	42.9	6	75.0	153
Bay of Plenty	-	-	8	88.9	9	75.0	11	100.0	9	81.8	3	100.0	2	100.0	5	62.5	2	66.7	5	83.3	4	100.0	1	50.0	59
Canterbury	-	-	46	97.9	54	98.2	36	97.3	24	100.0	13	100.0	9	100.0	6	66.7	12	85.7	7	87.5	2	100.0	1	50.0	210
Capital & Coast	-	-	15	83.3	13	81.3	19	100.0	12	92.3	5	100.0	9	75.0	6	75.0	3	60.0	3	100.0	4	80.0	1	100.0	90
Counties Manukau	-	-	18	72.0	28	87.5	29	90.6	10	83.3	11	100.0	6	75.0	8	61.5	16	88.9	6	85.7	3	60.0	3	100.0	138
Hawke's Bay	-	-	13	92.9	8	80.0	9	100.0	9	75.0	4	80.0	4	100.0	5	71.4	6	100.0	1	100.0	2	66.7	1	20.0	62
Hutt Valley	-	-	6	100.0	12	100.0	6	100.0	3	100.0	3	100.0	2	100.0	4	100.0	2	100.0	3	100.0	0	0.0	0	0.0	41
Lakes	-	-	5	83.3	9	81.8	12	100.0	3	100.0	5	100.0	1	100.0	2	100.0	4	80.0	1	100.0	2	100.0	-	-	44
Mid Central	-	-	12	85.7	21	91.3	10	100.0	5	100.0	5	100.0	3	75.0	5	83.3	4	80.0	3	75.0	2	66.7	-	-	70
Nelson	-	-	9	90.0	8	88.9	11	91.7	8	88.9	2	100.0	7	100.0	6	100.0	3	75.0	1	100.0	-	-	-	-	55
Marlborough																									
Northland	-	-	6	100.0	13	86.7	9	75.0	7	87.5	9	100.0	4	100.0	3	100.0	2	66.7	2	100.0	5	100.0	1	50.0	61
South Canterbury	-	-	2	100.0	11	84.6	3	100.0	1	100.0	1	100.0	0	0.0	1	50.0	1	100.0	-	-	-	-	-	-	20
Southern	2	100.0	18	90.0	21	91.3	27	100.0	16	100.0	10	100.0	12	92.3	7	87.5	5	100.0	3	100.0	4	100.0	4	80.0	129
Tairawhiti	-	-	6	85.7	11	91.7	3	75.0	3	100.0	3	100.0	-	-	1	100.0	1	50.0	-	-	-	-	-	-	28
Taranaki	-	-	8	100.0	11	91.7	12	100.0	5	100.0	4	80.0	8	100.0	1	25.0	1	100.0	-	-	1	100.0	-	-	51
Waikato	1	100.0	22	100.0	29	85.3	19	95.0	13	100.0	9	90.0	9	90.0	9	56.3	8	88.9	6	75.0	6	100.0	1	100.0	132
Wairarapa	-	-	0	0.0	1	100.0	2	100.0	6	100.0	-	-	2	100.0	1	50.0	-	-	2	100.0	-	-	3	100.0	17
Waitemata	-	-	21	84.0	38	97.4	28	90.3	23	92.0	10	100.0	6	85.7	4	80.0	8	66.7	4	66.7	6	85.7	-	-	148
West Coast	-	-	4	100.0	3	75.0	3	100.0	2	100.0	1	100.0	1	100.0	3	100.0	-	-	-	-	-	-	-	-	17
Whanganui	-	-	3	100.0	4	100.0	3	100.0	3	75.0	3	75.0	2	100.0	-	-	-	-	1	100.0	-	-	-	-	19
Total	**4**	**100.0**	**245**	**88.8**	**345**	**88.7**	**277**	**94.2**	**181**	**92.3**	**107**	**96.4**	**103**	**89.6**	**85**	**71.4**	**81**	**81.8**	**50**	**86.2**	**44**	**80.0**	**22**	**66.7**	**1,544**

'– ' 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 59 - 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	138	117
Bay of Plenty	51	40
Canterbury	189	177
Capital & Coast	83	69
Counties Manukau	139	132
Hawke's Bay	70	64
Hutt Valley	43	40
Lakes	48	47
Mid Central	68	64
Nelson Marlborough	58	51
Northland	70	65
South Canterbury	16	15
Southern	124	118
Tairawhiti	30	28
Taranaki	52	47
Waikato	133	129
Wairarapa	18	15
Waitemata	130	128
West Coast	15	15
Whanganui	22	21
Private practice	*252*	*160*
Total	**1,749**	**1,542**

Table 60 - 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	281	267	183	68.5	222	83.1
Pacific	78	71	48	67.6	58	81.7
Asian	157	141	110	78.0	129	91.5
European/ Other	1,160	1,023	794	77.6	956	93.5
Total	**1,676**	**1,502**	**1,135**	**75.6**	**1,365**	**90.9**

Table 61 - 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	*1,433*	*1,344*	*1,054*	*78.4*	*1,263*	*94.0*
Auckland	125	111	88	79.3	102	91.9
Bay of Plenty	46	37	22	59.5	30	81.1
Canterbury	184	174	129	74.1	164	94.3
Capital & Coast	81	68	48	70.6	63	92.6
Counties Manukau	134	128	96	75.0	115	89.8
Hawke's Bay	65	62	53	85.5	61	98.4
Hutt Valley	42	40	35	87.5	39	97.5
Lakes	48	47	38	80.9	45	95.7
Mid Central	66	62	49	79.0	60	96.8
Nelson Marlborough	55	50	26	52.0	48	96.0
Northland	68	65	49	75.4	57	87.7
South Canterbury	15	14	13	92.9	14	100.0
Southern	119	114	94	82.5	111	97.4
Tairawhiti	30	28	21	75.0	25	89.3
Taranaki	50	46	39	84.8	42	91.3
Waikato	125	122	111	91.0	118	96.7
Wairarapa	16	15	14	93.3	15	100.0
Waitemata	128	126	105	83.3	119	94.4
West Coast	15	15	5	33.3	15	100.0
Whanganui	21	20	19	95.0	20	100.0
Private Practice	*243*	*158*	*81*	*51.3*	*102*	*64.6*
Total	**1,676**	**1,502**	**1,135**	**75.6**	**1,365**	**90.9**

Table 62 - 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	16
SC	16	8
AC1-AC5	27	8
R10, R14	10	8
Total	**73**	**40**

** 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 63 - 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	435	395	90.8	379	87.1	371	93.9	349	88.4
Bay of Plenty	225	203	90.2	204	90.7	190	93.6	135	66.5
Canterbury	246	231	93.9	232	94.3	226	97.8	225	97.4
Capital & Coast	134	118	88.1	124	92.5	115	97.5	94	79.7
Counties Manukau	358	338	94.4	321	89.7	313	92.6	303	89.6
Hawke's Bay	93	87	93.5	82	88.2	80	92.0	51	58.6
Hutt Valley	46	43	93.5	42	91.3	40	93.0	36	83.7
Lakes	66	62	93.9	56	84.8	56	90.3	53	85.5
Mid Central	148	142	95.9	139	93.9	137	96.5	121	85.2
Nelson Marlborough	48	44	91.7	47	97.9	44	100.0	33	75.0
Northland	64	57	89.1	56	87.5	52	91.2	49	86.0
South Canterbury	18	14	77.8	17	94.4	14	100.0	13	92.9
Southern	125	119	95.2	119	95.2	118	99.2	108	90.8
Tairawhiti	51	49	96.1	46	90.2	44	89.8	42	85.7
Taranaki	55	47	85.5	50	90.9	46	97.9	46	97.9
Waikato	267	249	93.3	238	89.1	231	92.8	192	77.1
Wairarapa	18	17	94.4	18	100.0	17	100.0	17	100.0
Waitemata	426	397	93.2	382	89.7	376	94.7	351	88.4
West Coast	28	25	89.3	25	89.3	24	96.0	24	96.0
Whanganui	49	47	95.9	46	93.9	45	95.7	44	93.6
Private practice	*623*	*306*	*49.1*	*584*	*93.7*	*267*	*87.3*	*257*	*84.0*
Total	**3,523**	**2,990**	**84.9**	**3,207**	**91.0**	**2,806**	**93.8**	**2,543**	**85.1**

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 64 - 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	454	425	93.6	393	86.6	375	88.2	314	73.9
Pacific	166	151	91.0	144	86.7	137	90.7	130	86.1
Asian	399	341	85.5	364	91.2	321	94.1	303	88.9
European/ Other	2,504	2,073	82.8	2,306	92.1	1,973	95.2	1,796	86.6
Total	**3,523**	**2,990**	**84.9**	**3,207**	**91.0**	**2,806**	**93.8**	**2,543**	**85.1**

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 65 - 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	*10,832*	*97.0*	*100.0*	*91.5*	*95.4*	*94.9*	*92.1*
Auckland	914	98.0	100.0	92.2	99.0	98.4	93.1
Bay of Plenty	597	97.3	100.0	90.6	92.6	92.5	91.6
Canterbury	1,737	96.6	100.0	91.3	96.8	96.1	91.0
Capital & Coast	666	98.9	100.0	86.9	93.5	92.8	92.6
Counties Manukau	1,030	97.1	100.0	91.8	98.6	98.4	91.8
Hawke's Bay	310	97.7	100.0	92.1	89.4	89.4	93.5
Hutt Valley	225	98.7	100.0	96.5	95.6	94.7	96.4
Lakes	246	95.9	100.0	94.4	92.7	92.7	92.3
Mid Central	632	94.3	100.0	92.6	98.4	97.9	91.1
Nelson Marlborough	318	96.2	100.0	90.4	99.1	99.1	89.6
Northland	332	95.2	100.0	95.4	99.1	98.5	93.1
South Canterbury	113	96.5	100.0	90.9	94.7	94.7	92.0
Southern	622	97.1	100.0	87.5	98.7	98.6	90.2
Tairawhiti	184	98.9	100.0	90.5	98.4	98.4	94.0
Taranaki	354	97.7	100.0	87.6	98.9	98.3	91.5
Waikato	823	97.9	100.0	95.0	98.9	97.9	95.0
Wairarapa	84	96.4	100.0	89.6	97.6	97.6	90.5
Waitemata	1,337	96.0	100.0	91.5	84.0	83.2	92.2
West Coast	119	94.1	100.0	90.1	97.5	97.5	88.2
Whanganui	189	98.4	100.0	92.5	97.9	97.9	93.7
Private practice	1,285	*96.3*	*100.0*	*93.1*	*92.8*	*88.9*	*92.4*
Total	**12,117**	**96.9**	**100.0**	**91.6**	**95.1**	**94.3**	**92.2**

Table 66 - 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	*10,832*	*10,503*	*54.5*	*5.1*
Auckland	914	896	57.9	4.9
Bay of Plenty	597	581	56.4	5.9
Canterbury	1,737	1,678	63.0	6.0
Capital & Coast	666	659	42.6	6.5
Counties Manukau	1,030	1,000	58.9	5.2
Hawke's Bay	310	303	49.0	4.2
Hutt Valley	225	222	61.3	2.2
Lakes	246	236	61.4	3.7
Mid Central	632	596	49.5	4.0
Nelson Marlborough	318	306	62.3	6.6
Northland	332	316	44.0	2.1
South Canterbury	113	109	44.2	4.4
Southern	622	604	52.7	7.6
Tairawhiti	184	182	57.1	6.0
Taranaki	354	346	46.0	6.5
Waikato	823	806	55.2	2.9
Wairarapa	84	81	51.2	6.0
Waitemata	1,337	1,284	47.3	4.4
West Coast	119	112	53.8	5.9
Whanganui	189	186	58.7	4.8
Private practice	*1,285*	*1,238*	*53.8*	*4.0*
Total	**12,117**	**11,741**	**54.4**	**5.0**

** Field has been completed*

Table 67 - 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	*5,900*	*5,486*	*93.0*	*551*	*175*	*31.8*	*4,381*	*806*	*18.4*
Auckland	529	491	92.8	45	18	40.0	340	36	10.6
Bay of Plenty	337	293	86.9	35	9	25.7	225	34	15.1
Canterbury	1,095	1,038	94.8	104	50	48.1	538	129	24.0
Capital & Coast	284	263	92.6	43	7	16.3	339	94	27.7
Counties Manukau	607	573	94.4	54	17	31.5	369	41	11.1
Hawke's Bay	152	144	94.7	13	1	7.7	145	23	15.9
Hutt Valley	138	131	94.9	5	2	40.0	82	15	18.3
Lakes	151	143	94.7	9	4	44.4	86	14	16.3
Mid Central	313	289	92.3	25	5	20.0	294	47	16.0
Nelson Marlborough	198	182	91.9	21	7	33.3	99	31	31.3
Northland	146	137	93.8	7	1	14.3	179	56	31.3
South Canterbury	50	43	86.0	5	2	40.0	58	4	6.9
Southern	328	305	93.0	47	18	38.3	247	65	26.3
Tairawhiti	105	97	92.4	11	3	27.3	68	26	38.2
Taranaki	163	151	92.6	23	5	21.7	168	30	17.9
Waikato	454	440	96.9	24	7	29.2	345	16	4.6
Wairarapa	43	39	90.7	5	2	40.0	36	9	25.0
Waitemata	632	563	89.1	59	12	20.3	646	116	18.0
West Coast	64	59	92.2	7	2	28.6	48	15	31.3
Whanganui	111	105	94.6	9	3	33.3	69	5	7.2
Private practice	*691*	*586*	*84.8*	*51*	*32*	*62.7*	*543*	*123*	*22.7*
Total	**6,591**	**6,072**	**92.1**	**602**	**207**	**34.4**	**4,924**	**929**	**18.9**

Indicator 7.5 – Timely discharge of women after treatment

Table 68 - Follow-up of treated women with colposcopy and cytology in the period up to nine months post-treatment, and discharge of eligible women

	Total treatments	Eligible for discharge*		Women discharged appropriately	
DHB	N	N	% of women treated	N	% of eligible
Auckland	131	93	71.0	63	67.7
Bay of Plenty	69	53	76.8	45	84.9
Canterbury	212	163	76.9	139	85.3
Capital & Coast	60	48	80.0	45	93.8
Counties Manukau	176	120	68.2	111	92.5
Hawke's Bay	59	51	86.4	41	80.4
Hutt Valley	38	30	78.9	30	100.0
Lakes	31	19	61.3	15	78.9
Mid Central	80	62	77.5	54	87.1
Nelson Marlborough	42	34	81.0	33	97.1
Northland	57	36	63.2	32	88.9
South Canterbury	12	7	58.3	5	71.4
Southern	116	92	79.3	88	95.7
Tairawhiti	31	23	74.2	20	87.0
Taranaki	39	36	92.3	30	83.3
Waikato	138	113	81.9	106	93.8
Wairarapa	8	7	87.5	7	100.0
Waitemata	149	98	65.8	77	78.6
West Coast	14	11	78.6	10	90.9
Whanganui	32	24	75.0	21	87.5
Private Practice	*95*	*77*	*81.1*	*55*	*71.4*
Total	**1,589**	**1,197**	**75.3**	**1,027**	**85.8**

** 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 69 - Follow-up of treated women in the period up to nine months post-treatment

DHB	Total treatments	Colposcopy within 9 months post-treatment		Colposcopy & cytology within 9 months post-treatment	
	N	N	%	N	%
Auckland	131	107	81.7	106	80.9
Bay of Plenty	69	27	39.1	27	39.1
Canterbury	212	154	72.6	154	72.6
Capital & Coast	60	50	83.3	50	83.3
Counties Manukau	176	148	84.1	143	81.3
Hawke's Bay	59	50	84.7	45	76.3
Hutt Valley	38	35	92.1	35	92.1
Lakes	31	20	64.5	20	64.5
Mid Central	80	69	86.3	68	85.0
Nelson Marlborough	42	32	76.2	32	76.2
Northland	57	48	84.2	48	84.2
South Canterbury	12	7	58.3	7	58.3
Southern	116	85	73.3	84	72.4
Tairawhiti	31	23	74.2	22	71.0
Taranaki	39	33	84.6	33	84.6
Waikato	138	99	71.7	98	71.0
Wairarapa	8	8	100.0	8	100.0
Waitemata	149	128	85.9	128	85.9
West Coast	14	10	71.4	10	71.4
Whanganui	32	28	87.5	28	87.5
Private practice	*95*	*70*	*73.7*	*70*	*73.7*
Total	**1,589**	**1,231**	**77.5**	**1,216**	**76.5**

Indicator 8 – HPV tests

Indicator 8.1 – Triage of low-grade cytology

Table 70 - Triage testing of women with ASC-US cytology

	Total ASC-US results		Women with an HPV test			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
Laboratory	**N**	**N**	**N**	**%**	**N**	**%**
Anatomical Pathology Services	185	294	4	2.2	290	98.6
Canterbury Health Laboratories	48	119	0	0.0	112	94.1
LabPLUS	68	162	0	0.0	159	98.1
Medlab Central Ltd.	88	195	0	0.0	181	92.8
Pathlab	124	320	6	4.8	316	98.8
Southern Community Laboratories	167	282	2	1.2	278	98.6
Total	**680**	**1,372**	**12**	**1.8**	**1,336**	**97.4**

** 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 71 - Triage testing of women with LSIL cytology

	Total LSIL results		Women with an HPV test			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
Laboratory	**N**	**N**	**N**	**%**	**N**	**%**
Anatomical Pathology Services	522	380	3	0.6	377	99.2
Canterbury Health Laboratories	106	54	1	0.9	53	98.1
LabPLUS	112	103	1	0.9	100	97.1
Medlab Central Ltd.	158	113	1	0.6	101	89.4
Pathlab	315	272	0	0.0	270	99.3
Southern Community Laboratories	953	589	9	0.9	574	97.5
Total	**2,166**	**1,511**	**15**	**0.7**	**1,475**	**97.6**

** 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 72 - 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	100	88	88.0	58	58.0	6	6.8	10.3
Canterbury Health Laboratories	24	22	91.7	17	70.8	3	13.6	17.6
LabPLUS	25	20	80.0	12	48.0	2	10.0	16.7
Medlab Central Ltd.	39	39	100.0	30	76.9	13	33.3	43.3
Pathlab	57	55	96.5	34	59.6	12	21.8	35.3
Southern Community Laboratories	80	72	90.0	46	57.5	17	23.6	37.0
Total	**325**	**296**	**91.1**	**197**	**60.6**	**53**	**17.9**	**26.9**

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

Table 73 - 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	239	215	90.0	160	66.9	23	10.7	14.4
Canterbury Health Laboratories	40	37	92.5	31	77.5	8	21.6	25.8
LabPLUS	24	21	87.5	16	66.7	4	19.0	25.0
Medlab Central Ltd.	51	49	96.1	35	68.6	11	22.4	31.4
Pathlab	134	129	96.3	82	61.2	17	13.2	20.7
Southern Community Laboratories	313	298	95.2	214	68.4	51	17.1	23.8
Total	**801**	**749**	**93.5**	**538**	**67.2**	**114**	**15.2**	**21.2**

** % 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 74 - Volume of HPV test samples received during the monitoring period, by laboratory

Laboratory	HPV tests received		Ratio HPV tests: smears received (%)
	N	% of national total	
Anatomical Pathology Services	4,303	23.6	10.0
Canterbury Health Laboratories	1,280	7.0	12.9
LabPLUS	915	5.0	9.5
Medlab Central Ltd.	1,816	10.0	12.0
Pathlab	2,536	13.9	9.7
Southern Community Laboratories	7,380	40.5	7.1
Total	**18,230**	**100.0**	**8.8**

Table 75 - Invalid HPV tests, by laboratory

Laboratory	Total	Valid		Invalid	
	N	N	%	N	%
Anatomical Pathology Services	4,303	4,301	100.0	2	0.05
Canterbury Health Laboratories	1,280	1,278	99.8	2	0.16
LabPLUS	915	914	99.9	1	0.11
Medlab Central Ltd.	1,816	1,816	100.0	-	0.00
Pathlab	2,536	2,534	99.9	2	0.08
Southern Community Laboratories	7,380	7,378	100.0	2	0.03
Total	**18,230**	**18,221**	**100.0**	**9**	**0.05**

Table 76 - Validity of HPV triage tests, by test technology

Test technology	Total HPV tests		Valid		Invalid	
	N	%	N	%	N	%
Abbott RealTime	8,660	*47.5*	8,656	100.0	4	0.05
Roche COBAS 4800	9,570	*52.5*	9,565	99.9	5	0.05
Total	**18,230**	***100.0***	**18,221**	**100.0**	**9**	**0.05**

Table 77 - Volume of HPV test samples received during the monitoring period, by purpose and ethnicity

	Post-treatment		Historical		Taken at colposcopy		HPV triage		Other		Total
Ethnicity	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Māori	386	15.1	1,103	43.1	139	5.4	318	12.4	612	23.9	2,558
Pacific	83	13.2	218	34.7	43	6.8	147	23.4	138	21.9	629
Asian	238	16.6	383	26.8	121	8.5	426	29.8	263	18.4	1,431
European/ Other	1,858	13.6	5,065	37.2	961	7.1	1,790	13.2	3,938	28.9	13,612
Total	**2,565**	**14.1**	**6,769**	**37.1**	**1,264**	**6.9**	**2,681**	**14.7**	**4,951**	**27.2**	**18,230**

Table 78 - Volume of HPV test samples received during the monitoring period, by purpose and age

	Post-treatment		Historical		Taken at colposcopy		HPV triage		Other		Total
Age	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
<20	-	0.0	-	-	3	33.3	-	0.0	6	66.7	9
20-24	174	23.7	47	6.4	194	26.4	-	0.0	320	43.5	735
25-29	627	33.8	602	32.5	170	9.2	-	0.0	456	24.6	1,855
30-34	578	20.5	1,053	37.4	156	5.5	564	20.0	466	16.5	2,817
35-39	391	16.0	1,058	43.3	148	6.1	466	19.1	383	15.7	2,446
40-44	273	12.2	1,008	45.0	93	4.2	397	17.7	467	20.9	2,238
45-49	218	9.1	1,092	45.4	108	4.5	388	16.1	599	24.9	2,405
50-54	134	7.0	713	37.3	124	6.5	342	17.9	596	31.2	1,909
55-59	68	4.3	528	33.1	96	6.0	227	14.2	674	42.3	1,593
60-64	52	4.5	357	31.0	93	8.1	169	14.7	482	41.8	1,153
65-69	34	4.3	210	26.7	52	6.6	103	13.1	388	49.3	787
70+	16	5.7	101	35.7	27	9.5	25	8.8	114	40.3	283
Total	**2,565**	**14.1**	**6,769**	**37.1**	**1,264**	**6.9**	**2,681**	**14.7**	**4,951**	**27.2**	**18,230**

Table 79 - 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	521	12.1	1,891	43.9	92	2.1	675	15.7	1,124	26.1	4,303
Canterbury Health Laboratories	307	24.0	360	28.1	230	18.0	168	13.1	215	16.8	1,280
LabPLUS	101	11.0	205	22.4	236	25.8	257	28.1	116	12.7	915
Medlab Central Ltd.	295	16.2	714	39.3	61	3.4	269	14.8	477	26.3	1,816
Pathlab	285	11.2	1,112	43.8	203	8.0	527	20.8	409	16.1	2,536
Southern Community Laboratories	1,056	14.3	2,487	33.7	442	6.0	785	10.6	2,610	35.4	7,380
Total	**2,565**	**14.1**	**6,769**	**37.1**	**1,264**	**6.9**	**2,681**	**14.7**	**4,951**	**27.2**	**18,230**

Table 80 - 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	*957*	*10,832*	*8.8*
Auckland	48	914	5.3
Bay of Plenty	105	597	17.6
Canterbury	163	1,737	9.4
Capital & Coast	59	666	8.9
Counties Manukau	88	1,030	8.5
Hawke's Bay	20	310	6.5
Hutt Valley	10	225	4.4
Lakes	68	246	27.6
Mid Central	29	632	4.6
Nelson Marlborough	28	318	8.8
Northland	27	332	8.1
South Canterbury	29	113	25.7
Southern	62	622	10.0
Tairawhiti	1	184	0.5
Taranaki	22	354	6.2
Waikato	84	823	10.2
Wairarapa	24	84	28.6
Waitemata	69	1,337	5.2
West Coast	8	119	6.7
Whanganui	13	189	6.9
Private practice	125	1,285	9.7
Total	**1,082**	**12,117**	**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 81 - Women eligible for and proportion who have received HPV testing for a historical high-grade abnormality, by age at 31 December 2017

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	62	62	33	53.2	25	40.3
30-34	2,026	2,011	1,268	63.1	943	46.9
35-39	6,258	6,217	4,102	66.0	3,324	53.5
40-44	9,743	9,669	6,606	68.3	5,422	56.1
45-49	10,703	10,591	7,262	68.6	6,021	56.9
50-54	7,850	7,715	5,305	68.8	4,428	57.4
55-59	5,698	5,545	3,775	68.1	3,150	56.8
60-64	3,504	3,391	2,359	69.6	2,003	59.1
65-69	2,056	1,921	1,268	66.0	1,073	55.9
70+	2,606	2,171	821	37.8	635	29.2
Total	**50,506**	**49,293**	**32,799**	**66.5**	**27,024**	**54.8**

** 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 82 - 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	4,034	3,968	2,195	55.3	1,656	41.7
Bay of Plenty	3,006	2,924	2,022	69.2	1,570	53.7
Canterbury	5,992	5,866	3,967	67.6	3,468	59.1
Capital & Coast	2,817	2,778	1,858	66.9	1,631	58.7
Counties Manukau	3,536	3,441	1,870	54.3	1,382	40.2
Hawke's Bay	2,228	2,165	1,551	71.6	1,309	60.5
Hutt Valley	1,534	1,497	1,004	67.1	863	57.6
Lakes	1,618	1,581	961	60.8	731	46.2
Mid Central	2,234	2,168	1,606	74.1	1,390	64.1
Nelson Marlborough	1,892	1,843	1,462	79.3	1,326	71.9
Northland	1,917	1,851	1,110	60.0	835	45.1
South Canterbury	842	819	607	74.1	528	64.5
Southern	4,763	4,661	3,281	70.4	2,826	60.6
Tairawhiti	907	878	554	63.1	446	50.8
Taranaki	2,231	2,162	1,578	73.0	1,389	64.2
Waikato	4,026	3,928	2,870	73.1	2,430	61.9
Wairarapa	509	495	317	64.0	272	54.9
Waitemata	5,150	5,037	3,104	61.6	2,259	44.8
West Coast	438	431	339	78.7	300	69.6
Whanganui	819	789	543	68.8	413	52.3
Unspecified	*13*	*11*	-	*0.0*	-	*0.0*
Total	**50,506**	**49,293**	**32,799**	**66.5**	**27,024**	**54.8**

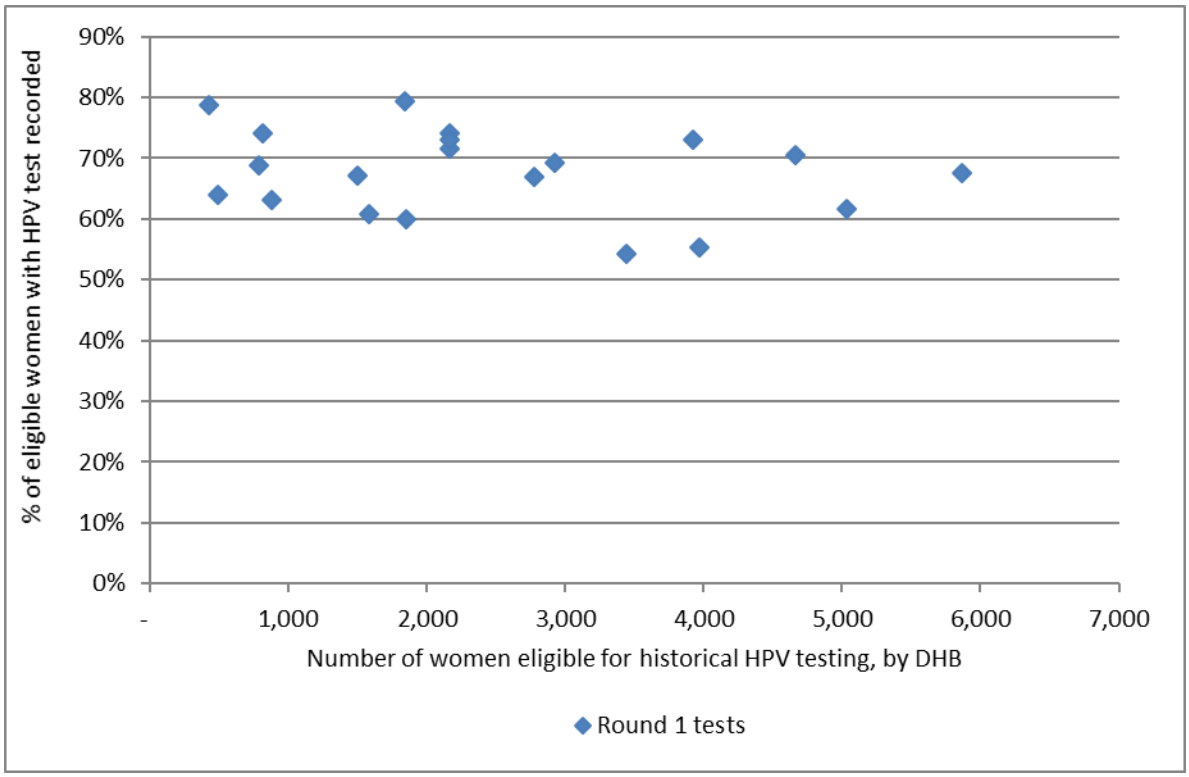
** Women are not followed up in the current report if they are no longer alive at the end of the current monitoring period; or if they have since had a non-squamous high-grade abnormality (no longer eligible for historical HPV testing).*

Table 83 - 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	7,887	7,607	4,699	61.8	3,567	46.9
Pacific	1,241	1,205	557	46.2	428	35.5
Asian	1,688	1,670	882	52.8	716	42.9
European/ Other	39,690	38,811	26,661	68.7	22,313	57.5
Total	**50,506**	**49,293**	**32,799**	**66.5**	**27,024**	**54.8**

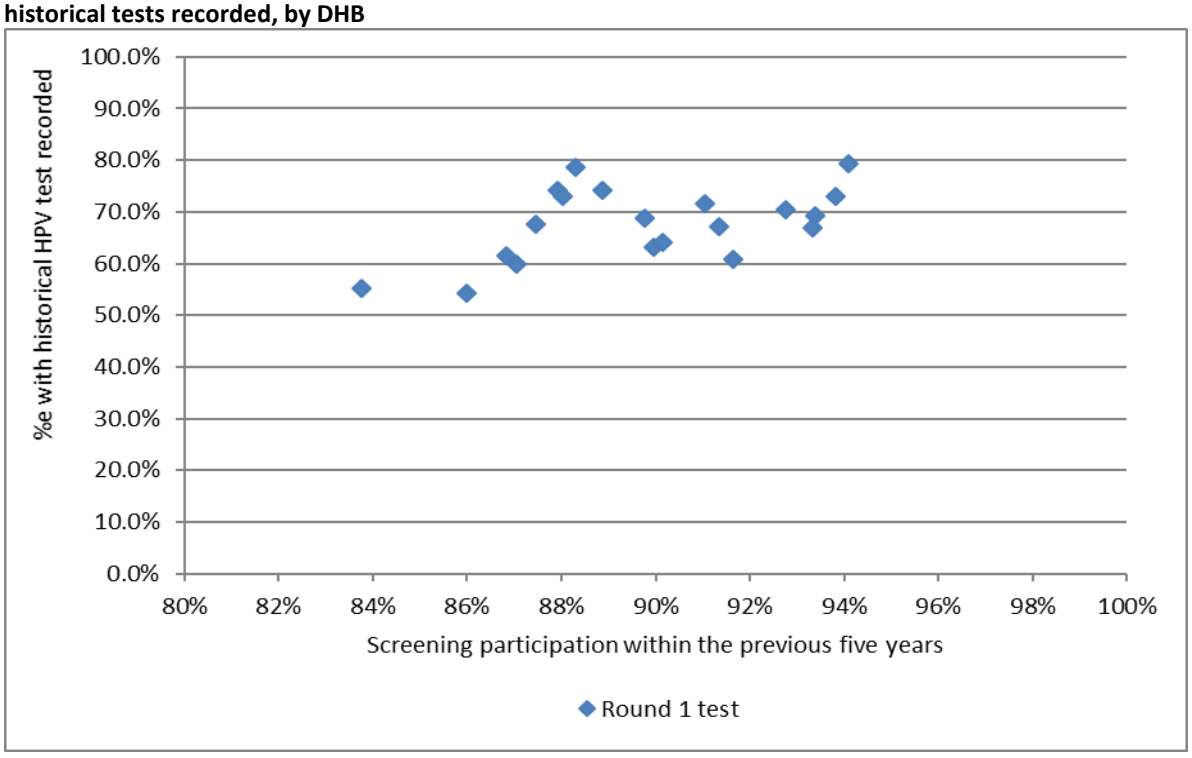
** Women are not followed up in the current report if they are no longer alive at the end of the current monitoring period; or if they have since had a non-squamous high-grade abnormality (no longer eligible for historical HPV testing).*

Figure 121 - Number of women eligible for historical testing within a DHB versus the percentage with a Round 1 historical HPV test recorded



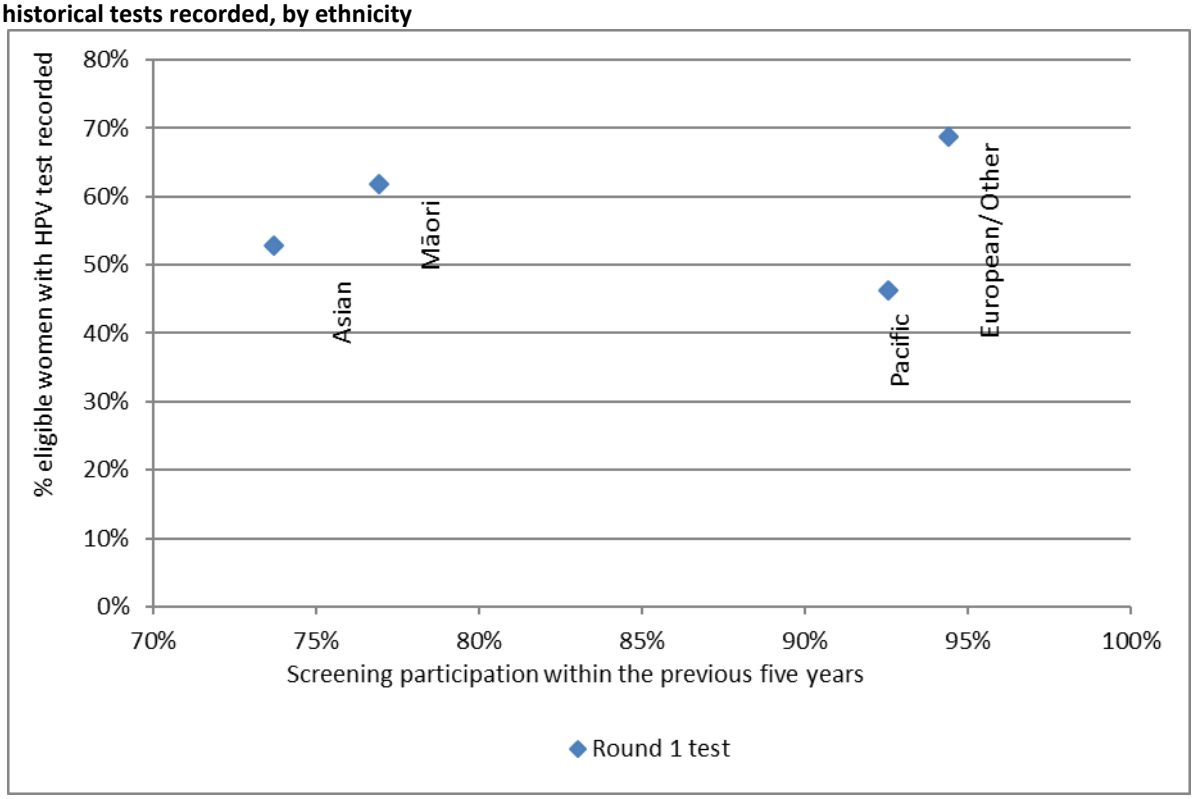
Each dot represents a DHB. This chart does not suggest that there is any relationship between the number of women eligible for testing and percent of women who have been tested, therefore this does not seem a likely explanation for the variation in women tested in different DHBs.

Figure 122 - 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 84

Figure 123 - 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 84 - 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	*83.8%*	55.3%	41.7%
Bay of Plenty	*93.4%*	69.2%	53.7%
Canterbury	*87.5%*	67.6%	59.1%
Capital & Coast	*93.3%*	66.9%	58.7%
Counties Manukau	*86.0%*	54.3%	40.2%
Hawke's Bay	*91.0%*	71.6%	60.5%
Hutt Valley	*91.4%*	67.1%	57.6%
Lakes	*91.6%*	60.8%	46.2%
Mid Central	*87.9%*	74.1%	64.1%
Nelson Marlborough	*94.1%*	79.3%	71.9%
Northland	*87.1%*	60.0%	45.1%
South Canterbury	*88.9%*	74.1%	64.5%
Southern	*92.8%*	70.4%	60.6%
Tairawhiti	*90.0%*	63.1%	50.8%
Taranaki	*93.8%*	73.0%	64.2%
Waikato	*88.0%*	73.1%	61.9%
Wairarapa	*90.2%*	64.0%	54.9%
Waitemata	*86.8%*	61.6%	44.8%
West Coast	*88.3%*	78.7%	69.6%
Whanganui	*89.8%*	68.8%	52.3%

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 85 - 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 and non-Pacific 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 (New Zealand Modified)	The Bethesda System 2001 NZ 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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