National Screening Unit

National Cervical Screening Programme

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About the authors

The authors are based in the Cancer Epidemiology Unit at Cancer Council NSW (Sydney, Australia). They are part of a research group (led by A/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 programs in New Zealand, Australia and England. Expert advisors to the group's research work include Professor Dame Valerie Beral (Director, Cancer Epidemiology Unit, University of Oxford) and Professor Bruce Armstrong (Professor of Public Health, University of Sydney). The group has extensive experience in the analysis of descriptive data from cervical cancer screening programmes. The team also has a range of related skills in the analysis of linked datasets, systematic review and meta-analysis, biostatistics, health economics, and advanced statistical modelling techniques.

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1. Executive Summary

Purpose

This report provides data on performance indicators of the National Cervical Screening Programme (NCSP) for the period 1 January to 30 June 2010.

Key points on performance/trends

Indicator 1 — Coverage

Target: 75% of eligible women to have had a screening test within the previous three years

- Coverage target was met nationally (75.1% of women aged 25-69 years screened in the previous three years).
- Coverage target was met for specific five-year age groups between 35-59 years.
- Coverage target was met by 12 of 21 DHBs.
- Coverage targets were met for European/Other women, but were not met for Māori, Pacific, or Asian women.
- Five-year coverage among women aged 25-69 years exceeds 80% in all DHBs, and in women in all age groups between 25-64 years.
- Coverage in women aged 20-24 years is likely to remain lower than for other ages because age is defined at the end of the monitoring period. 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.
- Due to changes in the source data used for the hysterectomy-adjusted population, coverage estimates in this report cannot readily be compared with recent reports.
- Undercounting of some ethnic groups may partially explain the disparities between ethnic groups.

Screens in women aged less than 20 years

Target: None

- In the three years to 30 June 2010, there were 17,671 women who had a cervical sample taken when they were aged less than 20 years. This is less than in the previous reporting period (19,058 women).
- This represents 1.8% of all women (of any age) who were screened in the three-year period (compared to 2.0% in previous reporting period).
- Most of these women (78%) were aged 18-19 years at the time of their cervical sample.

Indicator 2 — First screening events

Target: None

- There were 22,042 women who had their first screening event during the current reporting period – slightly fewer than in the previous reporting period.
- First screening events generally occur among young women (median age 26 years).
- Asian and Pacific women appear to have their first screening event at a later age (median ages of women with a first screening event 31 years and 28 years, respectively) than Māori women and European/Other women (median ages of women with a first screening event 22 years and 24 years, respectively).

Indicator 3 Withdrawal rates

Target: Zero between ages 20-69 years

- 47 women aged between 20-69 years withdrew from the register during this six-month period (0.003% of those enrolled at 31 December 2009). This is the same as the number of women in this age range who withdrew during the previous reporting period.

Indicator 4 Early re-screening

Target: Not yet defined

- Approximately 27% of a cohort of women with negative cytology and 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 occurs in all ethnic groups, but is most common among Asian women (32%), and least common among Pacific women (23%).
- Early re-screening has decreased slightly since the previous report.

Indicator 5.1 Cytology reporting

The proportion of cytology samples which are LBC has continued to increase since the previous reporting period, from 89.6% to 99.3%.

Unsatisfactory cytology

Target: 1-5% for LBC; 1-8% for conventional cytology

- Percent LBC samples unsatisfactory target met nationally, and by four of nine laboratories
- Percent conventional cytology samples unsatisfactory target met nationally, and by five of the nine laboratories
- Nationally, the rate of unsatisfactory samples has decreased for both LBC and for conventional cytology since the previous report.

Negative cytology

Target: No more than 96% of cytology samples

- Percent of samples negative target met nationally and by all laboratories.
- Nationally, the percent of samples which are negative is very similar to that reported in the previous period – there has been a small decrease, from 92.2% to 91.9%.

Abnormal cytology

Target: No more than 10% of cytology samples

- Percent of samples abnormal target met nationally and by seven of nine laboratories.
- Nationally, the percent of samples which are abnormal has increased slightly (from 7.8% to 8.1%) since the previous report.

HSIL cytology

Target: No less than 0.6% of cytology samples

- Percent of samples HSIL target met nationally and by eight of nine laboratories.

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

- All laboratories met the minimum target for HSIL+SC of 65%.
- Five of nine laboratories met the maximum target for HSIL+SC of 85%.
- Nationally, the positive predictive value of HSIL+SC for this monitoring period (83.5%) is very similar to that in the previous report (83.6%).

Other cytological abnormalities

Target: None

- Nationally, the positive predictive value of ASC-H has increased slightly since the previous report, from 51.0% to 51.8%.
- Nationally, the positive predictive value of the combination of ASC-H+HSIL+SC has increased slightly since the previous report, from 70.2% to 71.2%.
- Nationally, the positive predictive value of glandular abnormalities has decreased since the previous report, from 45.1% to 42.9% (however this is based on a comparatively small number of histology samples).

Indicator 5.3 Accuracy of negative cytology reports

Not assessed

Indicator 5.4 Histology reporting

Target: None

- 12,465 histology samples were taken during the current reporting period; 306 (2.5%) were insufficient for diagnosis.
- Results for most severe histology from 10,743 women are presented.
- 53.5% of women had histology samples which were negative or benign.
- 20.9% of women had high grade squamous histology results.
- 44 (0.4%) women had ISCC histology results, 57 (0.5%) women had invasive adenocarcinoma histology results, and one (<0.05%) had adenosquamous carcinoma histology results.

Indicator 5.5 Turnaround times

Cytology

Target: 90% within seven working days; 100% within 15 working days

- The seven-working-days target for cytology was not met nationally (84.4%), but was met by four of nine laboratories.
- The 15-working-days target was not met nationally (99.1%), but was met by one of nine laboratories.
- All nine laboratories had reported on at least 95% of samples within 15 days; five of the nine had reported on more than 99% of samples.
- Performance against the seven-working-days target has declined since the previous report.

Histology

Target: 90% within five working days; 99% within 15 working days

- Turnaround times for histology were below the target nationally (81.9% within five working days, 97.9% within 15 working days), but were met by six of 20 laboratories (five day target) and 15 of 20 laboratories (15 day target).
- 18 of the 20 laboratories had reported on at least 95% of samples within 15 days.
- Turnaround time for histology has declined slightly since the previous reporting period, however the number of laboratories meeting each of the targets is unchanged.

Cytology with associated HPV triage testing

Target: 100% within 15 working days

- There were 2,386 cytology samples with associated HPV triage testing in the current reporting period
- Turnaround times were below the target nationally. 79.7% of HPV samples were reported on within 15 working days.
- Two of the nine laboratories met the target of 100% within 15 days.
- Proportion reported within 15 days is lower for this subgroup of cytology (79.7%) than for cytology overall (99.1%), particularly at Aotea Pathology, Canterbury Health Laboratories, and Southern Community Labs Christchurch.
- This is the first time that turnaround times for cytology associated with HPV triage testing has been reported separately in the biannual monitoring reports.

Notes

- Turnaround time performance may be an underestimate due to limitations in the report date recorded on NCSP Register.

Indicator 6 <u>Follow-up of women with high grade cytology – histology</u>

Histological follow-up

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

- Targets were not met nationally (for either 90 days or 180 days).
- 78.2% of women had a histology report within 90 days of their high grade cytology report; 85.0% had one within 180 days.
- One DHB met the target for histological follow-up within 90 days; no DHB met the target for 180 days.
- Nationally, the proportion of women with histological follow-up has decreased slightly since the previous reporting period (from 78.6% to 78.2% within 90 days, and from 86.0% to 85.0% within 180 days).
- The proportion of Pacific women and Asian women with follow-up histology increased compared to the previous reporting period. The proportion of Māori women with follow-up histology decreased overall compared to the previous reporting period, but increased in some DHBs. The proportion was unchanged for European/Other women.

Any follow-up tests

Target: None

- Nationally, 6.7% of women had no follow-up test report (colposcopy, subsequent cytology, histology) within 180 days of their cytology report. By 360 days, 4.0% of women had no follow-up test report.
- Nationally, the proportion of women with no record of a follow-up test report at 180 days has increased slightly since the previous reporting period (from 6.2% to 6.7%). The proportion with no

record of a follow-up test report at 360 days is similar to that in the previous report.

- The proportion of Māori and Pacific women with no follow-up test has increased since the previous reporting period; whereas the proportion of Asian women with no follow-up test has decreased. Rates were unchanged for European/Other women.

Indicator 7 — Colposcopy indicators

Not assessed (indicators are in development).

Indicator 8 — HPV tests

HPV triage of low grade cytology

Target: None set (first time reported).

- Nationally, 60.5% of women aged 30 years or more with an ASC-US cytology result, and 61.6% of women aged 30 years or more with an LSIL cytology result are recorded as having a subsequent HPV triage test (this estimate excludes women with abnormal cytology in the five years preceding their low grade cytology).
- Among women aged 30 years or more with valid HPV triage test results, 25% of women with ASC-US results and 59% of women with LSIL results tested positive for high risk HPV.
- Positivity for high risk HPV varied by laboratory (from 10% to 44% for ASC-US, and from 49% to 70% for LSIL)
- Positivity for high risk HPV generally decreased with increasing age.
- Small numbers of HPV tests occur in women aged under 30 years (in 0.6% with an ASC-US result and no cytological abnormality in the preceding five years, and 1.3% of women with an LSIL result and no cytological abnormality in the preceding five years).
- Nationally, the proportion of HPV triage tests which are invalid is generally small (ranging from 0% for Abbott RealTime to 1.2% for Amplicor PCR). Rates varied across laboratories, but were below 3% in all cases, except one laboratory where a high rate (20%) was based on a small number of samples (five tests).
- Virtually all (97.8%) HPV triage tests were performed on cervical specimens collected on the same date as the cytology specimen (ie they appear to be reflex testing from the same LBC sample used for the cytology test). In one laboratory where this was less common, HPV samples were all collected within four weeks of the cytology sample.

HPV test volumes

Target: None set.

- Nationally, 11,278 cervical samples were received at laboratories for HPV testing during the current monitoring period.
- These samples generally related to women aged 30 years or more (89.0%)

- HPV samples were predominantly from European/Other women (9,563 samples; 84.8% of all HPV test samples).

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 those who die from it. The Programme recommends regular cervical screening at three yearly 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 is available in a separate report (Technical Specification for Monitoring Reports) available on the website:
www.cervicalscreening.govt.nz

From Report 30 onwards, monitoring has been undertaken with technical assistance of the Cancer Council of New South Wales (CCNSW). This has coincided with 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 is ongoing. In particular, colposcopy indicators are not calculated for this report due to the incompleteness of colposcopy data on the NCSP Register relating to this time period. These indicators will be reported on when the data has improved. Work is also underway to improve accuracy and completeness of ethnicity data on the Register. Other indicators, such as the accuracy of negative cytology reports, are in development and it is anticipated that these will be reported on in future.

Approval was sought and received from the National Kaitiaki Group (NKG) for access to Māori women's data from the NCSP Register in order to calculate various Programme indicators by ethnicity.

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 http://www.nsu.govt.nz/health-professionals/1072.aspx and on request from the NCSP Programme Leader:
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3. Methods

Age

Unless otherwise specified, age is defined as the woman's age at the end of the reporting period, i.e. 30 June 2010.

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 the Public Health Intelligence unit of the Ministry of Health. The hysterectomy prevalence was estimated by extracting information about procedures from hospital discharge data. Central estimates of survival and hysterectomy incidence in five-year age groups and five-year periods by ethnicity were then used to determine the prevalence of hysterectomy in all age groups, ethnicities and years. The 2007 data was taken from these estimates (the most recent data available). Further information about the hysterectomy prevalence methodology can be found in the document '*Setting Outcome Targets for the National Cervical Screening Programme. A Report for the National Screening Unit. November 2003*' by S. Paul, M. Tobias, and C. Wright.

The hysterectomy prevalence data were applied to New Zealand population estimates from Statistics New Zealand so that estimates of the number of women in the New Zealand population (by age and ethnicity) who had not had a hysterectomy prior to 30 June 2010 were obtained. Hysterectomy prevalence figures for the whole population (the denominator) were not available by DHB, so age- and ethnicity-specific hysterectomy adjustments were applied equally across each DHB. These adjusted population estimates were then used as the denominator in the hysterectomy-adjusted calculations.

The total population estimates used were the 2006 Census population, projected to 30 June 2010. This method differs from that in the previous reports, where the 2001 Census population, projected to 2006 was used, because at the time the analysis was performed for previous reports, estimates were not yet available from the 2006 Census for Asian women by DHB (rather, Asian women were grouped with European/ Other women within each DHB). This has improved the estimate for the target population relating to the current monitoring period, however it differs substantially from the previous estimate, largely due to population growth. For example the estimate used in the recent monitoring reports for the hysterectomy-adjusted population between the ages of 25-69 years was 1,051,997, whereas the estimate based on more recent data (1,126,932), is approximately 7% higher. The extent of this increase has varied by ethnicity and DHB, and therefore coverage estimates in this

report cannot readily be compared against those in earlier reports (see *Indicator 1 – Coverage* for further commentary).

While the hysterectomy prevalence estimates were the best estimates available at the time of the analysis, they are becoming outdated. They relate to 2007, while this report covers a period up until the end of June 2010. In light of these limitations, measures which rely on the hysterectomy-adjusted population, particularly coverage, need to be interpreted with caution. It is also possible that the extent to which the estimated hysterectomy-adjusted population differs from the true population may vary by ethnicity and/ or by DHB. This may occur, for example if the age-specific prevalence of hysterectomy has changed more in some DHBs or ethnic groups than in others.

Ethnicity analysis

The analysis by ethnicity considered four groups – Māori, Pacific, Asian, or European/Other ethnic groups, based on their priority two ethnicity codes recorded on the NCSP Register. Women for whom ethnicity information were not available were included in the "European/Other" category. The data download used for the current analysis (NCSP Register data as at 4 March 2011) contained ethnicity codes for approximately 94% 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. Coding of ethnicity on the NCSP Register follows the classification used by the Ministry of Health[1] [2]. The NCSP is continuing with work to improve the accuracy of ethnicity recording on the register.

Previous reports by the Health & Disability Intelligence Unit investigated potential ethnic undercounting in the NCSP Register, by comparing NCSP Register data to data from the National Health Index (NHI) and Register of Births, Deaths & Marriages (BDM). Undercounting of Māori, Pacific, and Asian women (and as a result, overcounting of European/Other ethnic groups) was found, although the degree to which this occurred varied by age-group, and has changed over time. Undercounting was estimated to be around 20% for each of the Māori, Pacific, and Asian groups in 2007. Undercounting may result in underestimates for some measures (for example coverage, first screening events, withdrawals) in Māori, Pacific, and Asian women, and overestimates for these measures in European/Other women.

The second Health & Disability Intelligence Unit report (*Wright 2008*)[3] calculated ethnicity adjustors for NCSP Register data in the period 1998-2007, based on the data from NHI and

[1] Ministry of Health, 2004. *Ethnicity Data Protocols for the Health and Disability Sector* Wellington; Ministry of Health. Available at www.moh.govt.nz

[2] Ministry of Health, 2006. *Asian Health Chart Book* Wellington, Ministry of Health. Available at www.moh.govt.nz

[3] Craig Wright. Health & Disability Intelligence Unit. Report Number 2: Accuracy of Ethnicity Data in the National Cervical Screening Programme Register (NCSP-R). September 2008.

BDM. The effect of the ethnicity adjustors is to increase the number of women included in each measure who are Māori, Pacific, or Asian to compensate for undercounting, and thus to reduce it for European/Other. In this monitoring report, ethnicity adjustors for 2006 from *Wright 2008* are applied to counts derived from the NSCP Register to explore the potential impact of under-counting on ethnicity-specific coverage. Unadjusted estimates for coverage are provided as the main results, consistent with previous monitoring reports; adjusted estimates are provided for illustrative purposes. Adjustors are not directly applicable to the full time period covered by this report however, so adjusted measures should be interpreted with caution.

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.

Until monitoring report 30 (1 July to 31 December 2008), coverage was calculated for women aged 20 – 69 years at the end of the monitoring period. However this includes some younger women who were not eligible for screening for the entire three years because they were aged 22 or less at the end of the three year screening period (i.e. were aged 17 – 19 years at the start of the three year period). This means that previously there may have been slightly underestimated coverage overall. Accordingly, a change to the method for measuring coverage was discussed and agreed on with the NCSP Advisory Group. The revised approach was to report coverage for women aged 25 – 69 years at the end of the monitoring period (which therefore 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 Australia and the UK.

Beginning with NCSP Monitoring Report 30 (1 July to 31 December 2008), coverage has been reported using the revised method but estimates using the old method (20-69 years at end of period) are also included for comparison.

The difference between the new (25-69 at end of period) and the old (20-69 at end of period) estimates is small (about 1-2%). However the advantage of the new method is 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 yearly coverage, (discussed above) we also report five yearly 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. Changes currently in progress include better methods for hysterectomy adjustment and ethnicity identifications.

4. Biannual NCSP Monitoring Indicators

Indicator 1 – 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 3 years prior to the end of the reporting 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, ie women aged 25-69 years at the end of the monitoring period. Screening coverage in women aged 20-69 years is also reported, for comparability with previous reports. The denominator (eligible populations) for this indicator is adjusted for the estimated proportion of women who have had a hysterectomy. Women who have withdrawn from or are not enrolled on the NCSP 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	75% of eligible women within three years
Current Situation	846,323 (75.1%) women aged 25-69 years at the end of the current reporting period had at least one cervical sample taken during the previous three years. This meets the target of 75%. 986,104 (87.5%) women aged 25-69 years at the end of the current reporting period had at least one cervical sample taken during the previous five years. Three-yearly coverage in women aged 25-69 years varied by DHB from 68.5% (Counties Manukau) to 83.3% (Taranaki). 12 of the 21 DHBs achieved the 75% target in women aged 25-69 years at the end of the period (Figure 1, Table 29). The target coverage of 75% of women screened at least once in 3 years was achieved in half of the five-year age groups between 20 and 69 years. The target was achieved for each of the specific five-year age groups between 35-59 years, but not for the five-year age groups between 20 and 34 years, or 60 to 69 years. Coverage was lowest in women aged 20-24 years (54.8%), however many women in this age group were not eligible for screening for the entire three-year period. Coverage was highest in women aged 45-49 years (80.6%) (Figure 2, Table 28). Three-yearly coverage also varied by ethnicity. Coverage targets of 75% were not met for Māori, Pacific, or Asian women. Coverage in these groups for women aged 25-69 years was 55.9%, 60.5%, and 54.6% respectively. Among

European/Other ethnic groups, coverage achieved was 83.6% (Figure 3, Table 30). Undercounting of some ethnic groups on the NCSP Register may account for some of this discrepancy. We explored the impact on the results of applying ethnicity adjustors estimated by Wright (*Wright 2008*), to re-weight the counts of women screened based on the level of under- and over-counting for different ethnic groups. As expected, the adjustment narrows the gap between the groups, such that it ranges from 65.4% (Māori) to 75.5% (European/ Other) among women aged 20-69 years, and from 66.6% (Māori) to 77.4% (European/ Other) among women aged 25-69 years. Adjusted estimates are shown in Table 31 and Table 32.

When compared to the findings for three-year coverage, five-year coverage had similar patterns of variation by age, DHB, and ethnicity to three-year coverage. Five-year coverage varied by age from 59.3% in women aged 20-24 years to 92.9% in women aged 45-49 years (Figure 5, Table 33). Among women aged 25-69 years at the end of the period, it ranged from 80.6% in Counties Manukau to 95.4% in Taranaki (Figure 4,Table 34), and from 63.4% (Asian) to 96.8% (European/Other ethnic groups) (Figure 6, Table 35).

Screens in women aged less than 20 years

A total of 17,671 women had a cervical sample taken in the three years to 30 June 2010 and were aged less than 20 years at the time of their cervical sample. This excludes two samples entered into the NCSP Register, where the apparent ages of the women were zero and two years. 1.8% of women who were screened at any age, were aged less than 20 years at the time their cervical sample was taken (Table 37).

The number of women aged less than 20 years at the time they were screened varied by DHB from 113 (West Coast) to 2,863 (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 common. Estimates for this proportion ranged from 6.9% (West Coast) to 15.9% (Canterbury and South Canterbury). Some smaller DHBs screen a relatively low number of women when they are younger than 20 years, but at a relatively high rate, because the population is also small (for example South Canterbury). Details of screens of women aged less than 20 years by DHB are presented in Figure 7, Table 37.

Further exploratory analysis determined that approximately three quarters of the women who were aged less than 20 years at the time of their cervical sample were aged 18-19 years (78% overall; range across DHBs 68%-89%; Table 38). This may represent opportunistic screening of women aged 18-19 years. This proportion varied from 68% in Wairarapa to 89% in Mid Central. Where this proportion is higher, it indicates that a larger proportion of screening in women aged less than 20 years may be attributable to opportunistic screening of women aged 18-19 years; as this proportion decreases, it indicates that more of the screening in women aged under 20 years is occurring in women aged under 18 years, and less may be attributed to opportunistic screening of women aged 18-19 years.

Trends

Coverage

Trends in coverage are difficult to ascertain for the current monitoring period, due to a change in the data used to estimate the target population (denominator). Furthermore, the change has not had an equal impact across different DHBs and ethnic groups, as discussed in more detail below (see *Comments*).

While it is difficult to compare rates in this report with those in recent reports, the number of women screened offers some insight. The number of women screened has increased in all ethnic groups; in all DHBs except Hutt Valley (where there has been a decrease of <1%); and in all age groups except women aged 35-39 years (where there has been a decrease of <1% and where the estimated target population has also decreased compared to that used in earlier reports). More information on trends will be available in the Annual Report for 2008/2009, when coverage since 2005 will be recalculated using the updated population estimates.

Screens in women aged less than 20 years

The number of women screened who are aged under 20 years has decreased from 19,058 in the previous reporting period to 17,671 in the current reporting period, as has the proportion of all women with screening events who are aged less than 20 years at the time of the event (from 2.0% to 1.8%). The proportion of these women who were aged 18-19 years has increased slightly since the previous reporting period (from 76% to 78%). The number of women screened who are aged less than 20 years at the time has decreased or remained similar in all DHBs.

Comments

Recent monitoring reports used the 2001 Census population, projected to 2006, and adjusted using hysterectomy prevalence estimates relating to 2006. The current report uses the 2006 Census population, projected to the end of the current monitoring period (30 June 2010), in conjunction with hysterectomy prevalence estimates for 2007 (the most recent year for which data was available). This is an improved estimate for the target population

relating to the current monitoring period, but it differs substantially from the previous estimate, largely due to population growth. For example the estimate used in the recent monitoring reports for the hysterectomy-adjusted population between the ages of 25-69 years was 1,051,997, whereas the estimate based on more recent data (1,126,932), is approximately 7% higher. The increase varies widely between ethnic groups, however, increases in the Māori, Pacific, Asian and European/ Other ethnic groupings are approximately 6%, 11%, 30%, and 4% respectively. Population growth has also varied between DHBs, with Canterbury, Counties Manukau, Waikato and West Coast having larger increases in population, and Lakes, Nelson Marlborough, Wairarapa and Whanganui having only small increases in their populations. The change has also varied widely by age group, ranging from a 2% decrease in the hysterectomy-adjusted female population aged 30-34 years to a 27% increase in the hysterectomy-adjusted female population aged 60-64 years.

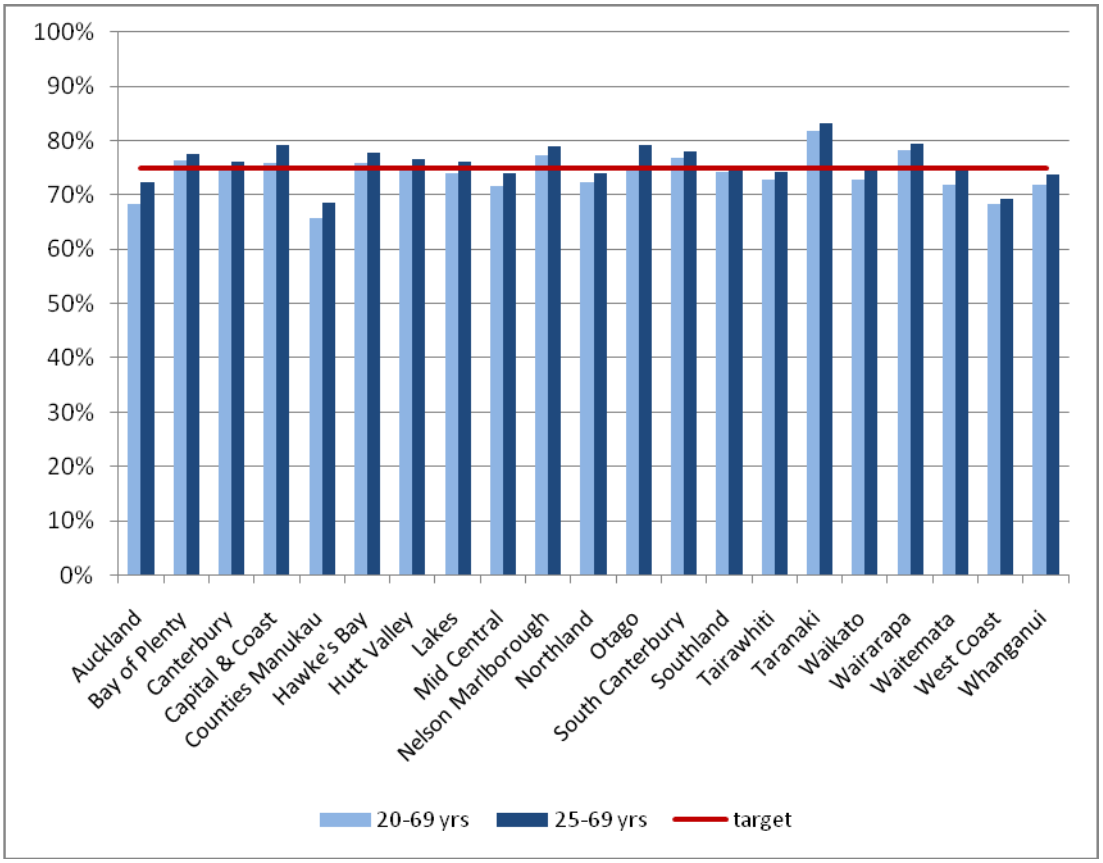
As discussed in Methods (*Hysterectomy-adjusted population*, page 9), the hysterectomy prevalence used to make the adjustment includes all women with a hysterectomy, some of whom may still require cervical screening. These women will have been removed from the denominator, but may still appear in the 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 (ie regardless of whether they have had a hysterectomy or not). Results for this analysis appear in Table 39.

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.

Misclassification of women's ethnicity (leading to under- and over-counting of different ethnicity groups) may be contributing in part to the differences in coverage achieved in different ethnicity groups. Our exploration of misclassification via ethnicity adjustors indicates that this is a factor, but is unlikely to explain all of the difference in observed coverage rates by ethnicity. Estimates which have adjusted for undercounting should be interpreted with caution however, since adjustors relate to 2006, and the periods considered for coverage are wider – ranging from 2007-2010 (three-year coverage), and 2005-2010 (five-year coverage). Like the primary (unadjusted) estimates, they also rely on the accuracy of the hysterectomy-adjusted population estimate.

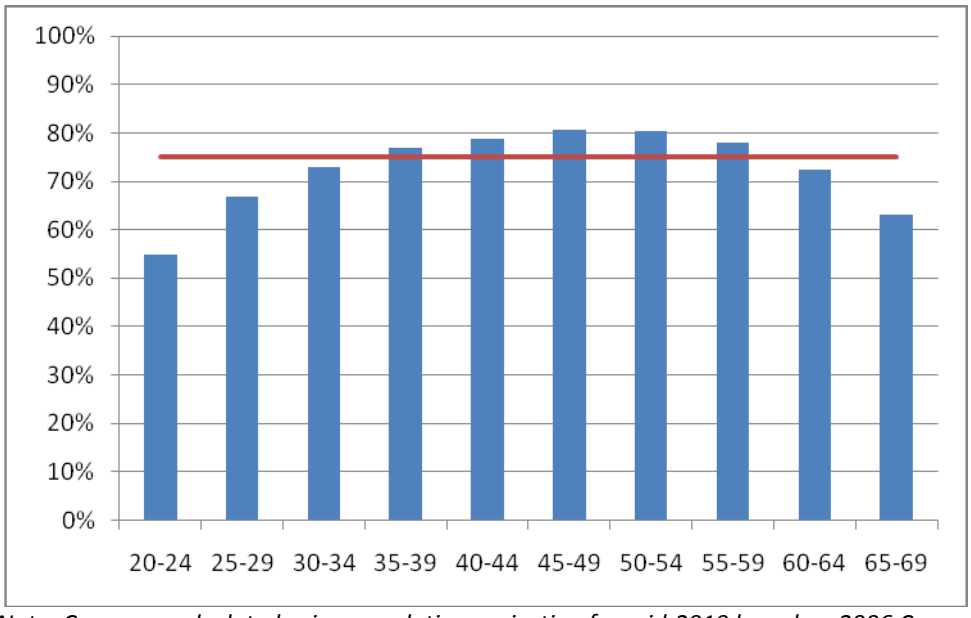
Coverage in women aged 20-24 years is likely to remain lower than for other ages and coverage in this age group should be interpreted with caution, as many women will have had a shorter period in which they were eligible for screening.

Figure 1 - Three-year coverage by DHB (women screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)



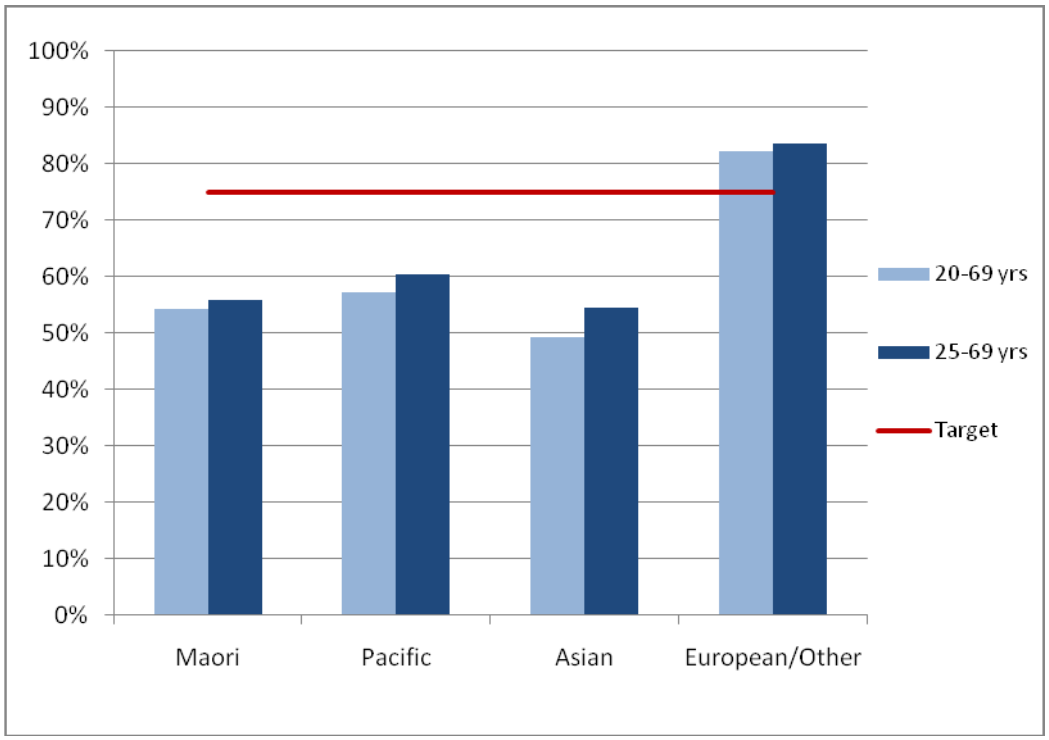
Note: Coverage calculated using population projection for mid-2010 based on 2006 Census data. Target 75%, hysterectomy adjusted.

Figure 2 - Three-year coverage by five-year age group (women 20-69 years screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)



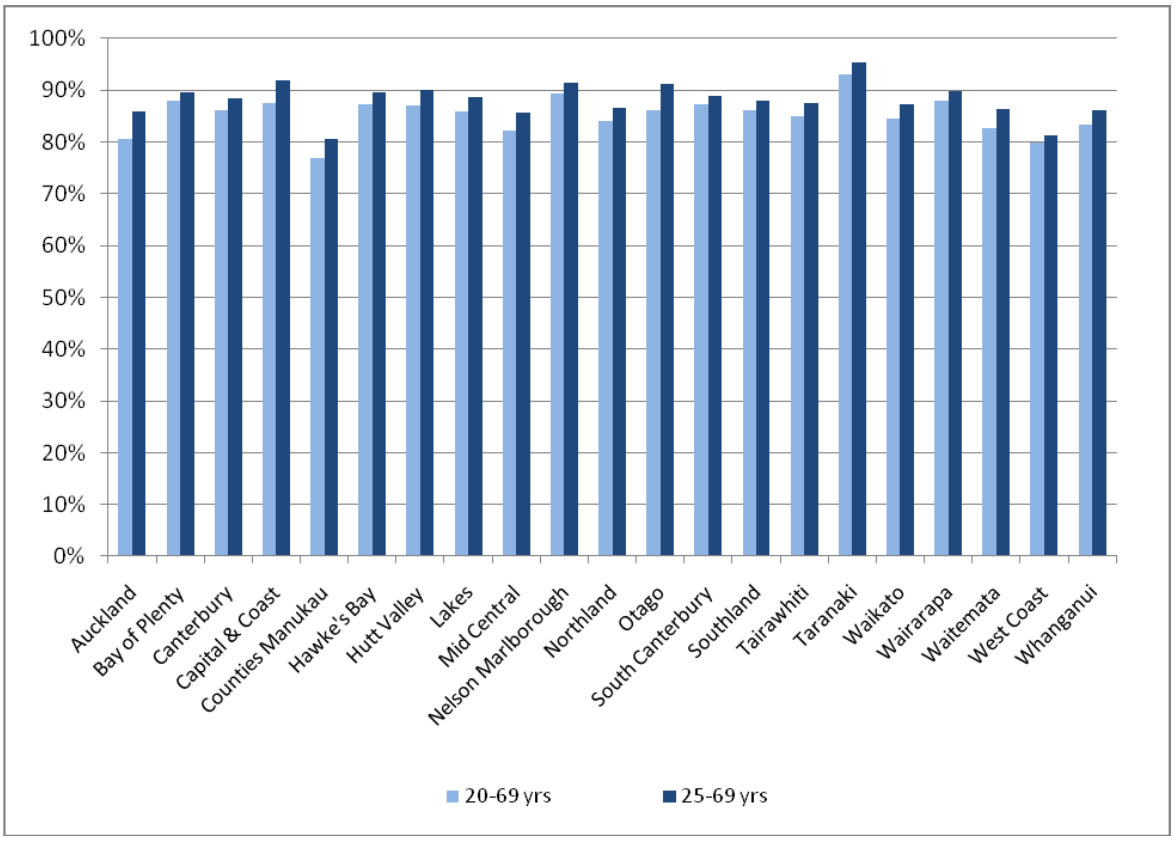
Note: Coverage calculated using population projection for mid-2010 based on 2006 Census data. Target (red line); 75%, hysterectomy adjusted.

Figure 3 - Three-year coverage by ethnicity (women screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)



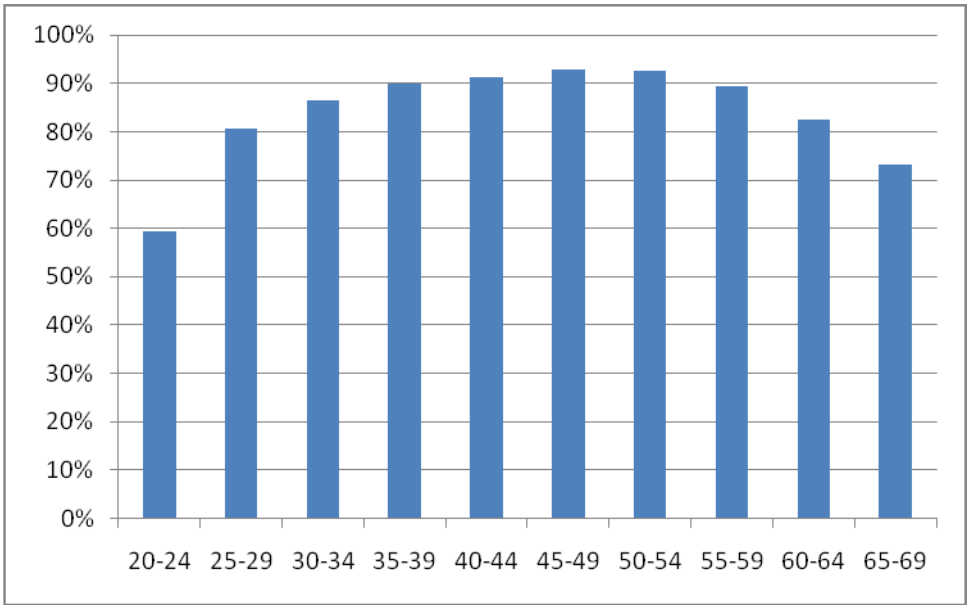
Note: Coverage calculated using population projection for mid-2010 based on 2006 Census data. Target 75%, hysterectomy adjusted.

Figure 4 - Five-year coverage by DHB (women screened in the five years prior to 30 June 2010, as proportion of hysterectomy-adjusted female population)



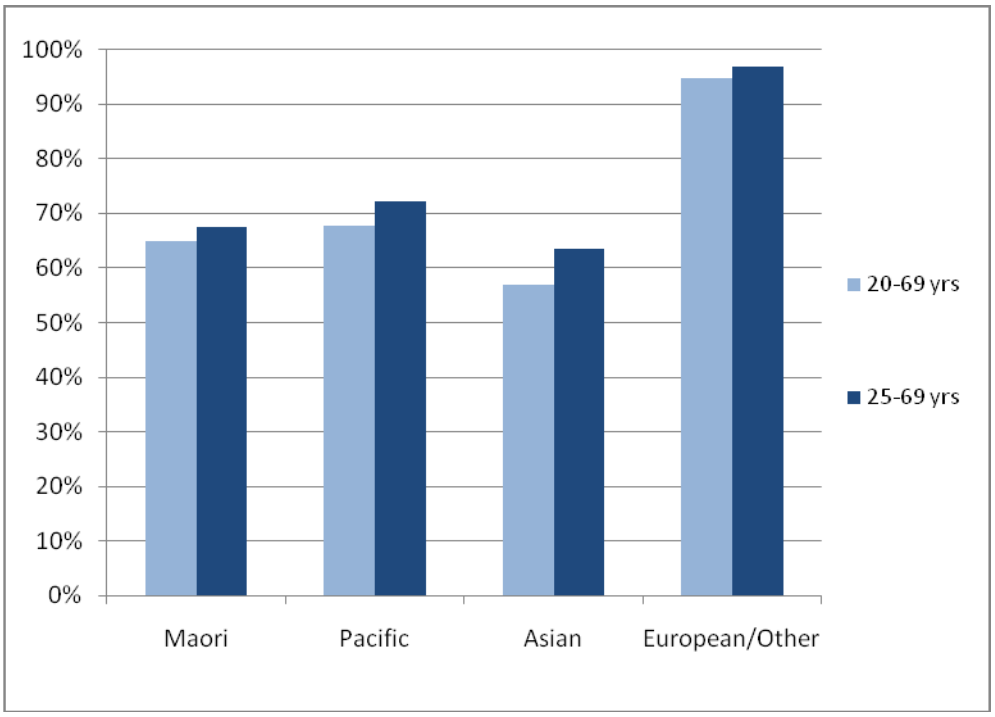
Note: Coverage calculated using population projection for mid-2010 based on 2006 Census data.

Figure 5 - Five-year coverage by five-year age-group (women screened in the five years prior to 30 June 2010, as proportion of hysterectomy-adjusted female population)



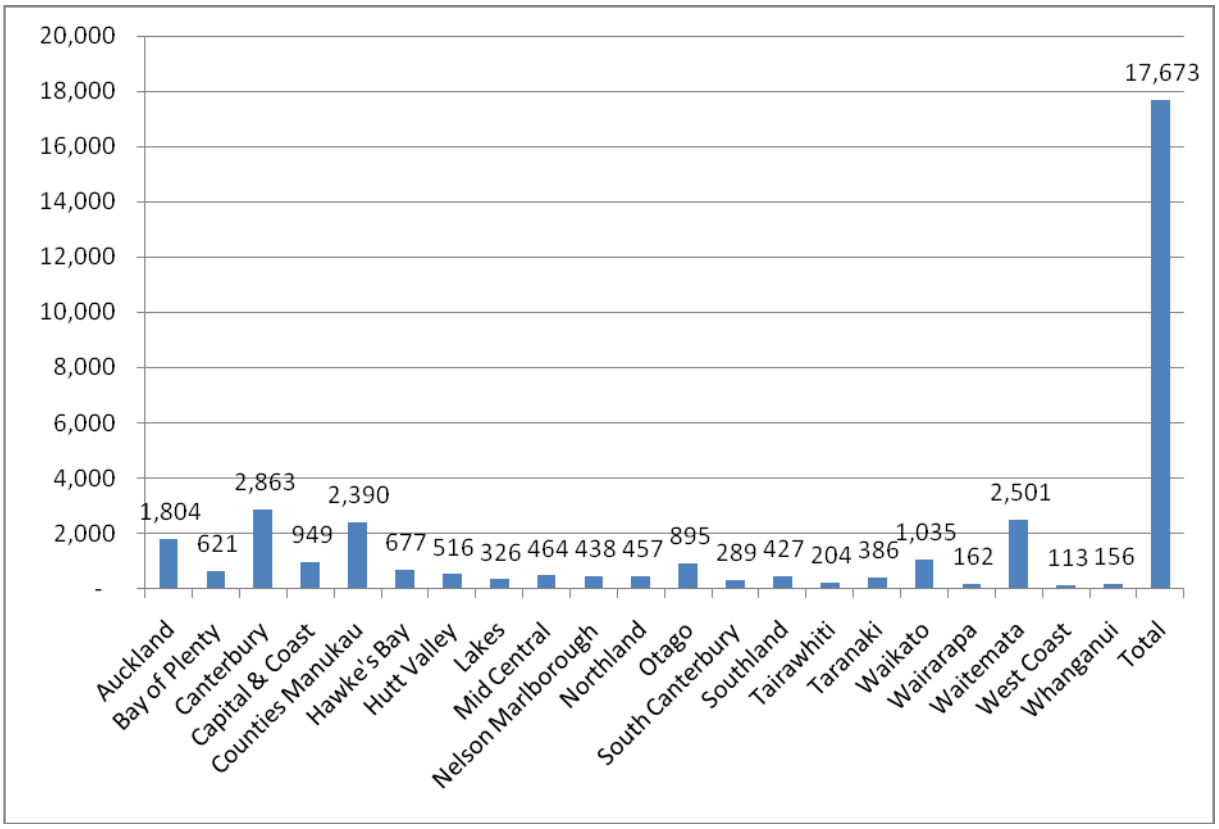
Note: Coverage calculated using population projection for mid-2010 based on 2006 Census data.

Figure 6 - Five-year coverage by ethnicity (women screened in the five years prior to 30 June 2010, as a proportion of hysterectomy-adjusted 2006 female population)



Note: Coverage calculated using population projection for mid-2010 based on 2006 Census data.

Figure 7 - Number of women screened who were aged less than 20 years at the time of their cervical sample in the three years to 30 June 2010, by DHB



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 screening event).

A woman's age is defined as her age at the end of the current reporting period (i.e. 30 June 2010).

This indicator is presented as the number of women by age and DHB. 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 time period (screening event), by DHB.

Target

There are no targets for first screening events.

Current Situation

22,042 women aged 20-69 years at the end of the period had their first screening event in the period 1 January – 30 June 2010. This constituted 10.2% of the 215, 360 women aged 20-69 years with a cervical sample taken (screening event) in the period, and 1.7% of the eligible population. The median age (at the end of the reporting 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 years. 9,949 women aged 20-24 had their first screening event recorded on the NCSP Register during this reporting period, accounting for 45.1% of all women aged 20-69 years with first screening events (Figure 8, Table 40). From this age group, first screening events decreased 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 (38.3%) (Figure 9), and the highest proportion of eligible women at that age with a first screening event recorded in the current reporting period (6.5%) (Figure 10).

The DHBs with the highest number of women aged 20-69 years with first screening events were Auckland (3,005) and Waitemata (2,907). The DHBs where women with first screening events, as a proportion of all women with screening events was the highest were Auckland (12.5%), Counties Manukau (12.6%), and Capital & Coast (12.4%). The DHB where this proportion was lowest was South Canterbury (6.6%) (Figure 11, Table 1).

The ethnic group with the highest number of women with first screening events was European/Other women (13,512) (Table 2). This mainly reflects their larger population size, however, as the group with the highest proportion of their eligible population being screened for the first time was Asian women (2.7%), compared to 1.6% for European/Other women (Table 2). The proportion of women screened who were being screened for the first time was also highest for Asian women (22.5%) (Table 2, Figure 12). This proportion is likely to be related to the median age of women with a first screening event, as groups where it is comparatively high

(22.5% for Asian women, 17.5% for Pacific women) also have an older median age of women with a first screening event (31 years for Asian women, 28 years for Pacific women) (Table 3).

Trends

The number of women with a first screening event recorded on the NCSP Register has decreased slightly, from 23,182 women in the previous period, to 22,043 in the current period. The proportion of the eligible population that this represents (1.7%) is very similar to what it was in the previous reporting period (1.9%). The proportion of women with screening events who are women with their first screening event being recorded on the NCSP Register (10.2%) is also similar to the previous period (10.9%).

Patterns by age, DHB, and ethnicity are very similar to those seen in the previous report. As was the case in the previous report, the median age of a first screening event was older for Asian and Pacific women than for Māori women and European/Other women, and women with first screening events constituted a larger proportion of the women screened for Asian and Pacific women.

Comments

Note that 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 taken outside New Zealand.

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 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 (which could be due to high coverage, or higher abnormality rates, as the latter require women to return more frequently). For example the DHB with the highest coverage, Taranaki, 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 register).

Figure 8 - Number of first screening events by five-year age group

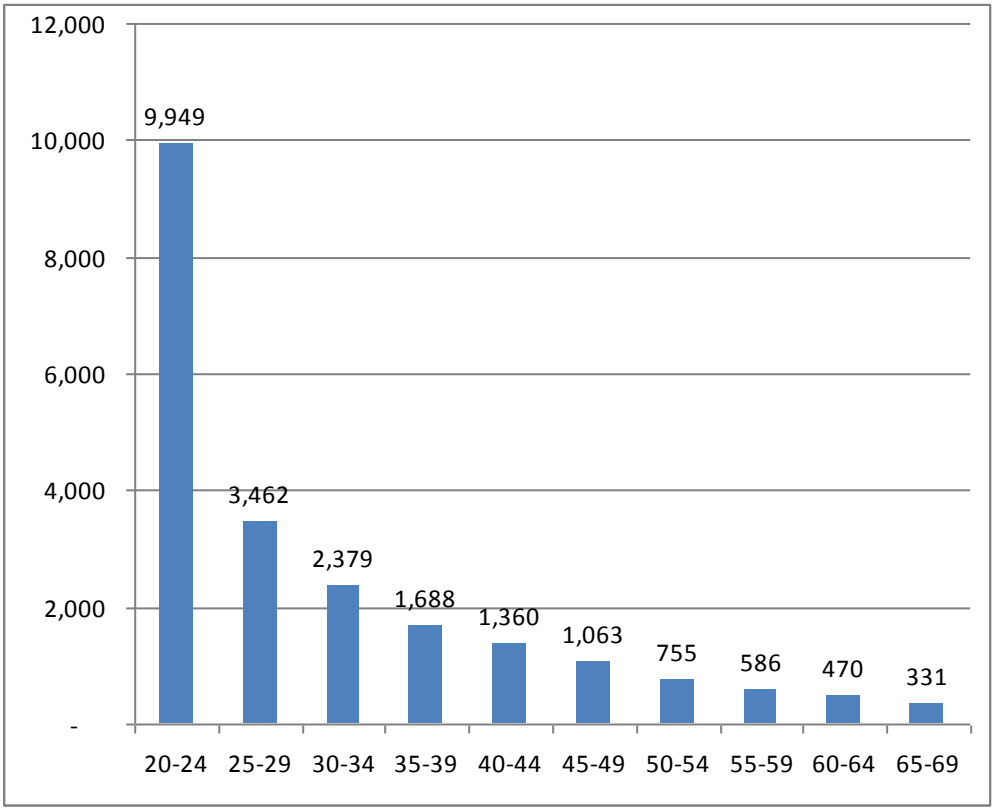


Figure 9 – Women with first screening events as a proportion of all women screened during the reporting period, by five-year age group (women aged 20-69 years at 30 June 2010)

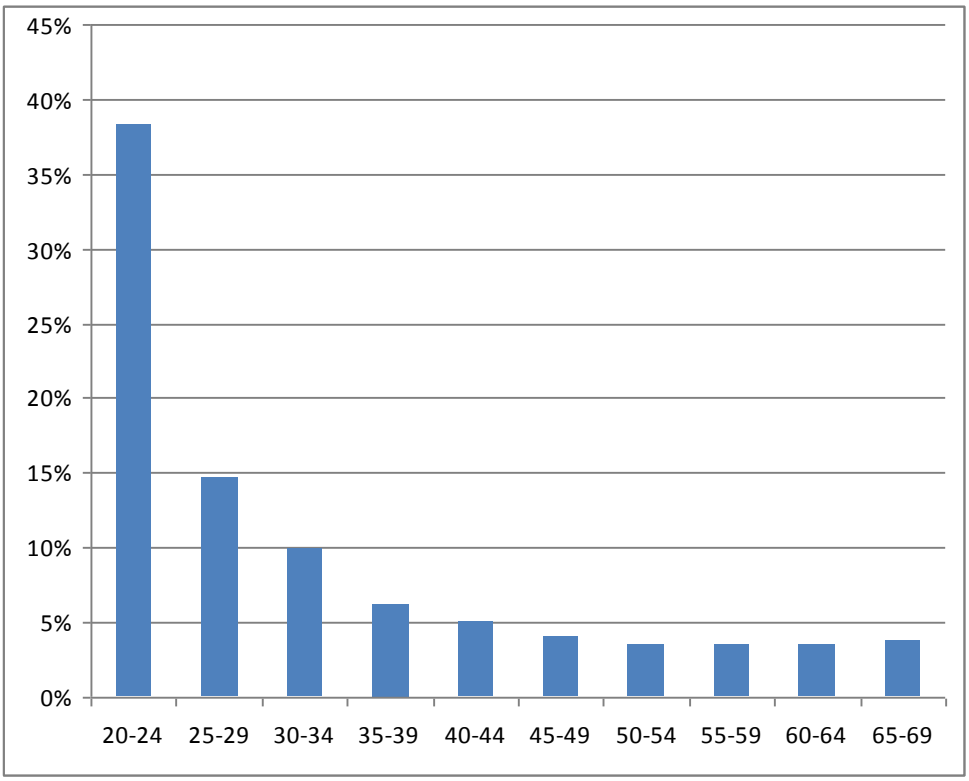
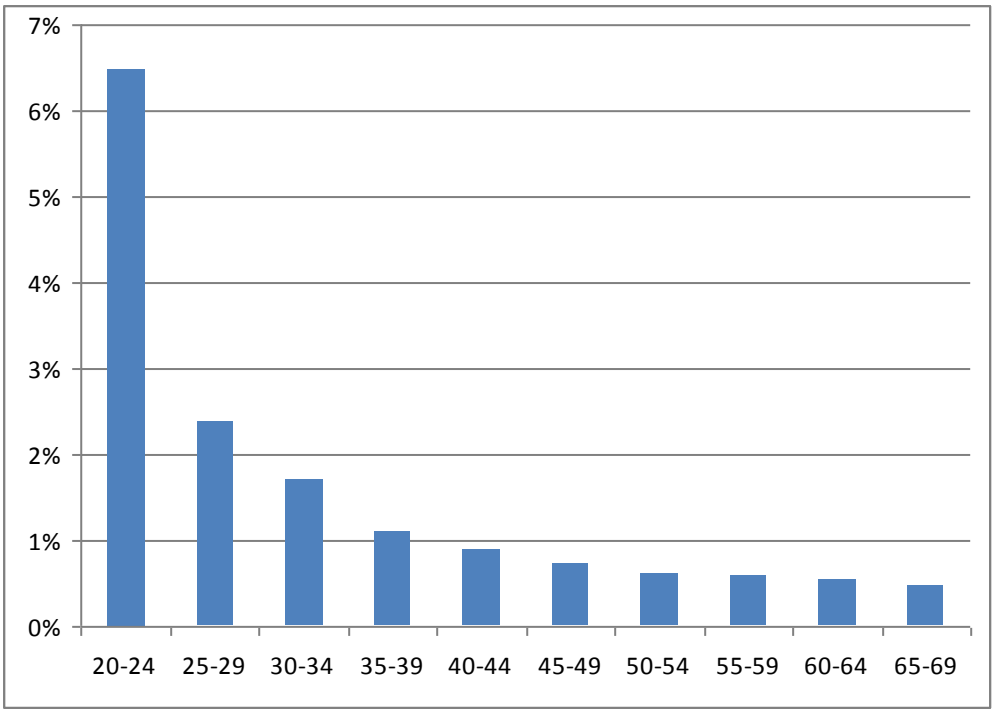


Figure 10 - Proportion of population* in that age group with their first screening event during the reporting period (women aged 20-69 years at 30 June 2010)



** Population estimated using population projection for mid-2010 based on 2006 Census data*

Figure 11 - Women with first screening events as a proportion of all women screened during the reporting period, by DHB (women aged 20-69 years at 30 June 2010)

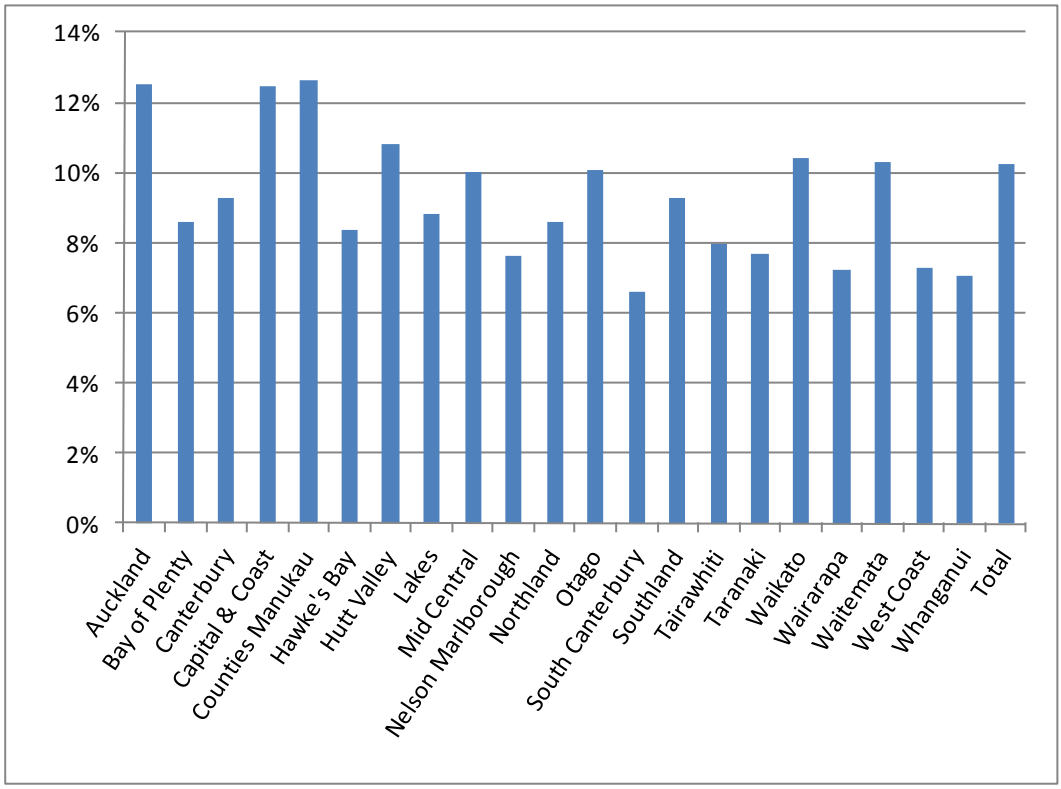


Figure 12 - Women with first screening events as a proportion of all women screened during the reporting period, by ethnicity

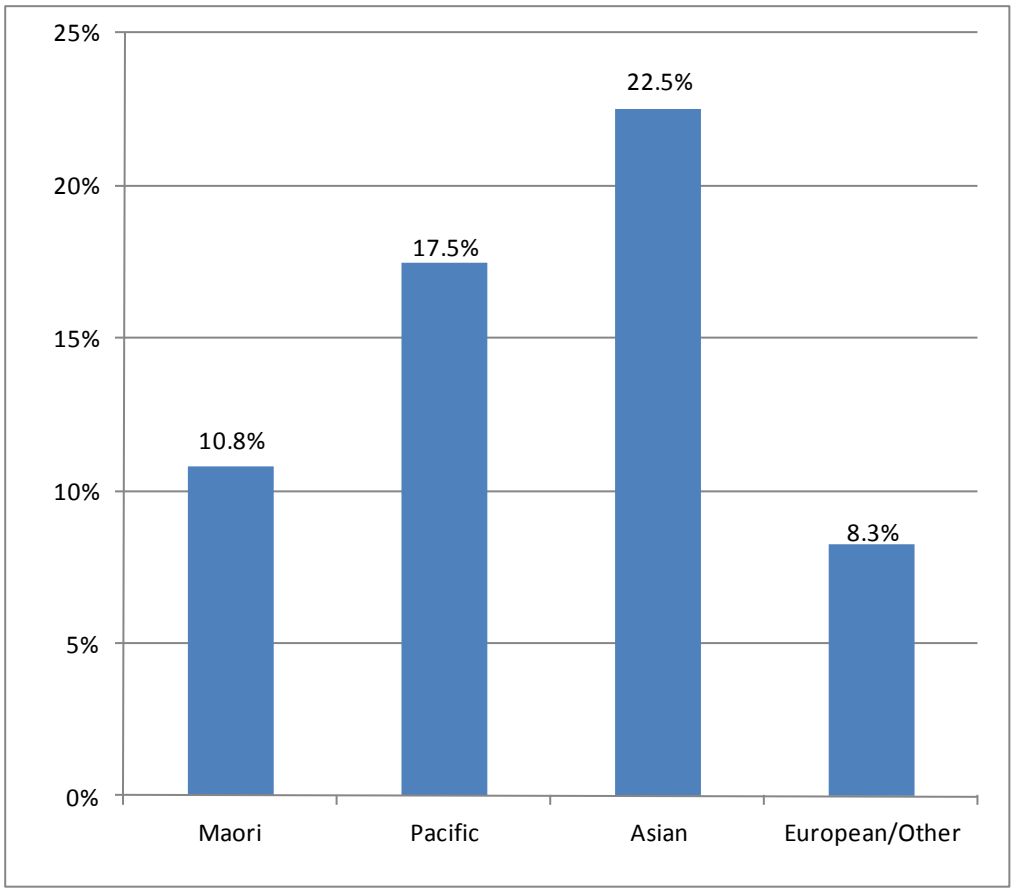


Table 1 - Women (ages 20-69 years) with first screening events as a proportion of i) total number of women with screening events, and ii) eligible women, by DHB, for period 1 January to 30 June 2010

DHB	Women with first events	As a proportion of women with a screening event		As a proportion of eligible population	
		N	%	N	%
Auckland	3,005	23,971	12.5	148,672	2.0
Bay of Plenty	859	10,025	8.6	58,437	1.5
Canterbury	2,416	26,116	9.3	147,233	1.6
Capital & Coast	1,934	15,549	12.4	92,978	2.1
Counties Manukau	2,750	21,775	12.6	143,141	1.9
Hawke's Bay	621	7,406	8.4	43,071	1.4
Hutt Valley	687	6,339	10.8	41,629	1.7
Lakes	438	4,971	8.8	29,319	1.5
Mid Central	792	7,892	10.0	47,513	1.7
Nelson Marlborough	541	7,107	7.6	39,162	1.4
Northland	618	7,191	8.6	43,386	1.4
Otago	1,008	10,025	10.1	55,501	1.8
South Canterbury	182	2,752	6.6	15,075	1.2
Southland	501	5,390	9.3	32,224	1.6
Tairawhiti	168	2,110	8.0	12,981	1.3
Taranaki	426	5,542	7.7	30,066	1.4
Waikato	1,742	16,769	10.4	102,786	1.7
Wairarapa	146	2,025	7.2	10,889	1.3
Waitemata	2,907	28,195	10.3	159,795	1.8
West Coast	105	1,436	7.3	9,154	1.1
Whanganui	196	2,774	7.1	17,219	1.1
Total	**22,042**	**215,360**	**10.2**	**1,280,230**	**1.7**

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 population projection for mid-2010 based on 2006 Census data for that DHB, as a percent

Table 2 - Women (ages 20-69 years) with first screening events as a proportion of i) total number of women with screening events, and ii) eligible women, by ethnicity, for period 1 January to 30 June 2010

Ethnicity	Women with first events	As a proportion of women with a screening event[i]		As a proportion of eligible population[ii]	
		N	%	N	%
Maori	2,393	22,127	10.8	176,003	1.4
Pacific	1,766	10,096	17.5	77,558	2.3
Asian	4,372	19,405	22.5	162,499	2.7
European/Other	13,512	163,751	8.3	864,170	1.6
Total	**22,043**	**215,379**	**10.2**	**1,280,230**	**1.7**

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 population projection for mid-2010 based on 2006 Census data for that DHB, as a percent

Table 3 – Median age of women with a first screening event, by ethnicity

Ethnicity	Median Age (years)
Māori	22
Pacific	28
Asian	31
European/Other	24

Indicator 3 – Withdrawal rates

Definition	The number of women, by age-group and DHB, not currently enrolled in the NCSP Register and whose enrolment ended during the reporting period (withdrawals). Withdrawals relate to active withdrawals, where women specifically elect to be removed from the NCSP Register. The proportion of women who were enrolled on the NCSP Register immediately prior to the current reporting period (that is, on 31 December 2009), whose enrolment ended within the current reporting period. Age is defined as a woman's age at the end of the reporting period.
Target	Zero for ages 20-69 years.
Current Situation	At the commencement of the reporting period, 1,364,848 women aged 20-69 years, and 1,509,875 women in total were enrolled on the NCSP Register. 47 women withdrew from the NCSP Register during the reporting period, all of whom were aged 20-69 years at the end of the monitoring period (0.003% of all women any age who were enrolled at the commencement of the period) (Table 4). The DHBs with the largest number of withdrawals were Auckland (eight women), Canterbury (seven women) and Nelson Marlborough (six women) (Figure 13, Table 42). In all DHBs the proportion of those enrolled at the beginning of the period who withdrew was extremely small (<0.02%). No women withdrew in Capital & Coast, Hutt Valley, Lakes, Southland, Wairarapa or Whanganui during this period (Table 42). The age groups with the largest proportion of women withdrawing among those who were enrolled at the beginning of the period were women who were aged 60-64 years at the end of the period (0.007%) and women aged 50-54 years at the end of the period (0.007%). No women aged 70 years or more at the end of the reporting period (outside the screening target age range) withdrew during the reporting period (Table 2, Figure 14). No Māori women withdrew during the current reporting period, and the proportion of Pacific, Asian, and European/Other women withdrawing was extremely small (Pacific 0.004%, Asian 0.006%, European/Other 0.004%) (Table 5, Figure 15).
Trends	The number of women who withdrew in the current reporting period (47 aged 20-69 years, 47 any age) is very similar to the number who withdrew in the previous reporting period (47 aged 20-69 years; 48 any age).
Comments	The proportion of women choosing to actively 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.

Figure 13 - Number of women (aged 20-69 years) who withdrew from the Register by DHB, 1 January to 30 June 2010

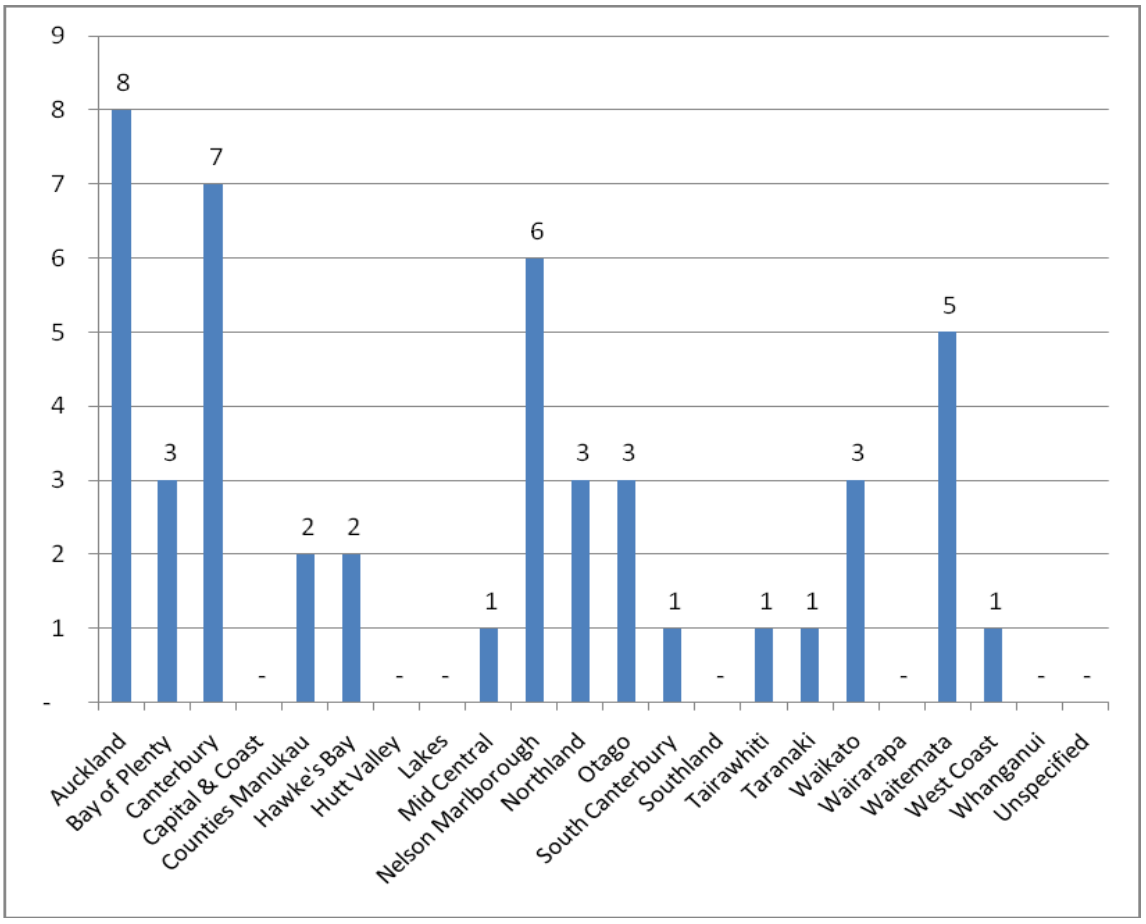


Figure 14 - Number of women (aged 20-69 years) who withdrew from the Register by age, 1 January to 30 June 2010

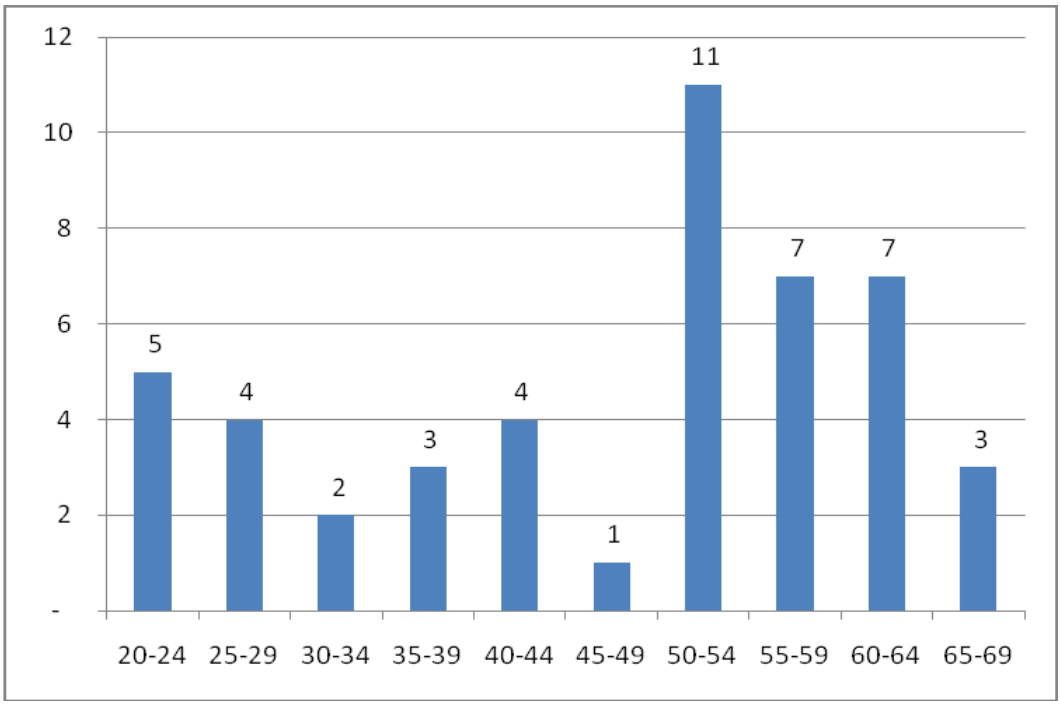


Figure 15 - Number of women (aged 20-69 years) who withdrew from the NCSP Register by ethnicity, 1 January to 30 June 2010

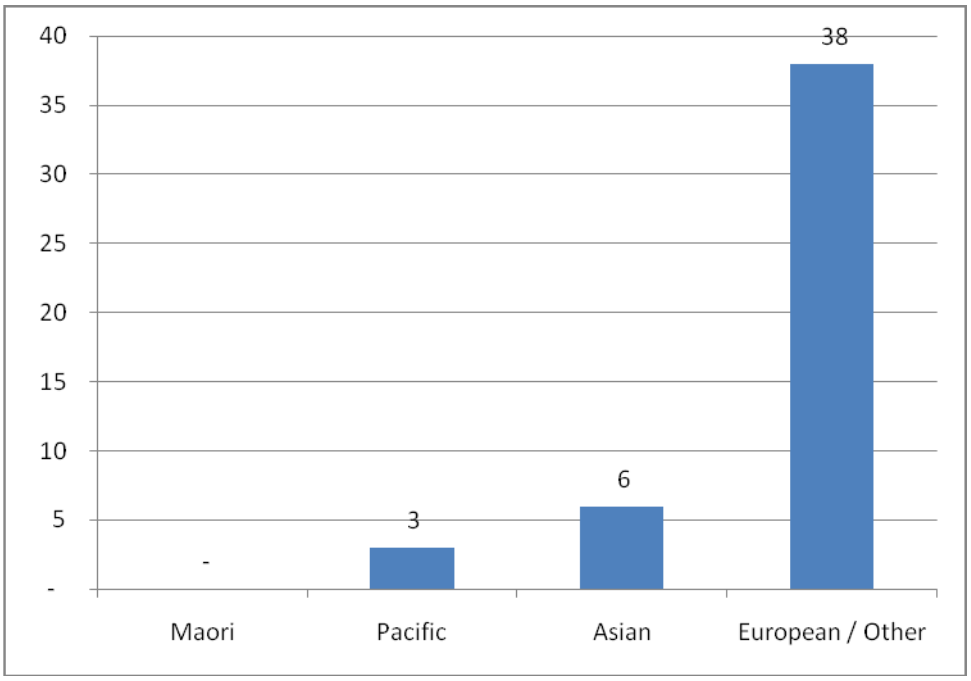


Table 4 - Number of women who withdrew from the NCSP Register 1 January to 30 June 2010 by age, and proportion of women who were enrolled at the start of the reporting period who withdrew

Age group	Women enrolled at start of period	Women who withdrew during period	
		N	% *
<20	4,469	-	0
20-24	82,192	5	0.006
25-29	131,384	4	0.003
30-34	152,659	2	0.001
35-39	183,281	3	0.002
40-44	183,370	4	0.002
45-49	180,399	1	0.001
50-54	153,392	11	0.007
55-59	213,537	7	0.006
60-64	102,614	7	0.007
65-69	72,020	3	0.004
70+	140,558	-	0
Total (all ages)	**1,509,875**	**47**	**0.003**
Total (ages 20-69)	**1,364,848**	**47**	**0.003**

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

Table 5 - Number of women (aged 20-69 years) who withdrew from the NCSP Register 1 January to 30 June 2010 by ethnicity, and proportion of women who were enrolled at the start of the reporting period who withdrew

Age group	Women enrolled at start of period	Women who withdrew during period	
		N	% *
Māori	153,413	-	0.000
Pacific	71,584	3	0.004
Asian	109,083	6	0.006
European/Other	1,030,768	38	0.004
Total	**1,364,848**	**47**	**0.003**

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

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 women with an index smear taken between 1 August 2007 – 30 September 2007 (inclusive), who i) were aged 20 – 66 years at the time the smear was taken (and hence remained within the screening target age range throughout the period); and ii) had a negative cytology result; and iii) were given a recommendation to return at the regular interval of three years as a result of their smear in August/ September 2007 (NZ Modified Bethesda code R1). Using this method of calculating the measure allows the follow-up to be considered over 30 months for every individual woman.

This measure excludes women with negative cytology being followed according to the *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 reporting period (ie 30 June 2010).

Target

A target has not yet been set for this cohort-based calculation method. This method of calculation will result in a higher value than the previous interval-based method used prior to Report 30, because all women are followed over the same length of time (30 months). A more detailed discussion of the reasons for this, and the rationale for the cohort-based method, can be found in Monitoring Report 30.

Current Situation

38,196 women had a smear taken in August or September 2007, were aged between 20-66 years at the time of their negative smear, and were given a recommendation to return for their next smear at the routine interval of three years. Among these women, 10,196 (26.7%) had at least one subsequent smear in the following 30 months.

There was wide variation in early re-screening by DHB. Early re-screening was most common in Waitemata (38.6%) and Lakes (35.3%), and was least common in Taranaki (13.0%) (Figure 16, Table 44).

There was also some variability by age. Younger women (aged 20-24 years at the end of the period) were most likely to be re-screened early (32.2%), and older women (aged 65-69 years) were the least likely to be re-screened early (18.5%) (Figure 17, Table 43).

Among the ethnic groups considered, Asian women were the most likely to be re-screened early (32.5%). Early re-screening was least common among Māori women (23.1%) (Figure 18, Table 45).

Trends

The level of early re-screening is slightly lower than in the previous monitoring report, when it was 27.4%.

DHBs with the lowest and highest levels of early re-screening are largely unchanged since the previous report.

Trends for early re-screening by age are complex. Some age groups have had increased levels of early re-screening compared to the previous report (women aged 25-29, 30-34, 40-44, and 60-64 years); while early re-screening has reduced noticeably in others (women aged 35-39, 50-54, 55-59, or 65-69 years). Early re-screening has decreased in all ethnic groups.

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 negative cytology result and 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 denominator, and potentially the numerator). Women excluded from the early re-screening group would include those who had just had their first smear or their first smear after a period of time (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. Prior to Report 30, calculation of this indicator had not explicitly used recommendation codes to define the group of women of interest, and therefore the estimates for this measure is not directly comparable with estimates prior to report 30.

It is important to note that whilst early re-screening rates appear to be relatively high in women aged 20-24 years, three-year coverage is much lower in this age-group. While a small proportion of women in this age group may be screened more frequently than recommended, a much larger proportion is under-screened or unscreened.

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, but this probably does not exclude all screens performed in response to clinical symptoms.

Note that the accuracy of the calculation is reliant on the correct use of R1 code in laboratory reports. An exploratory analysis of the accuracy of the R1 code was published in a previous monitoring report (Report 30). It suggested that R1

codes were generally accurate, and the small number of discrepancies would not have a substantial effect on the estimate for early re-screening.

Figure 16 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB

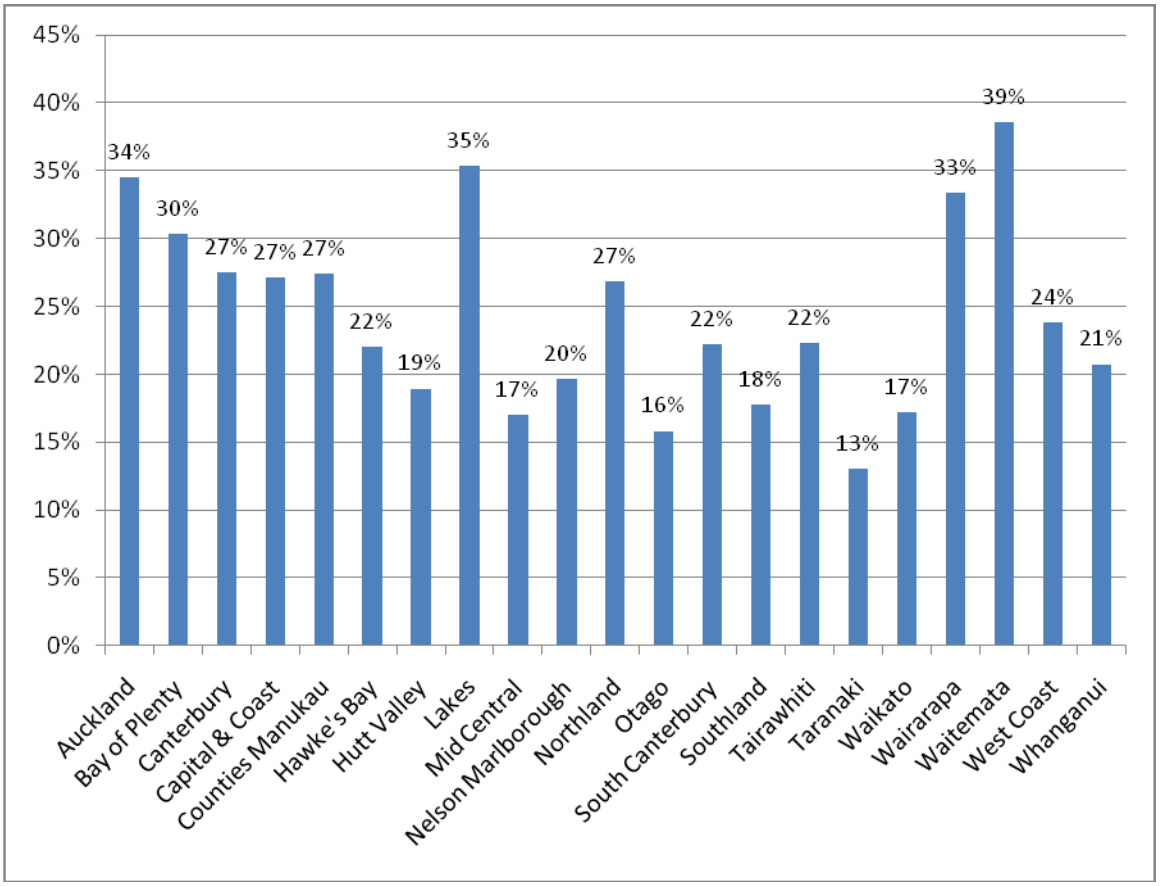


Figure 17 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by five-year age group

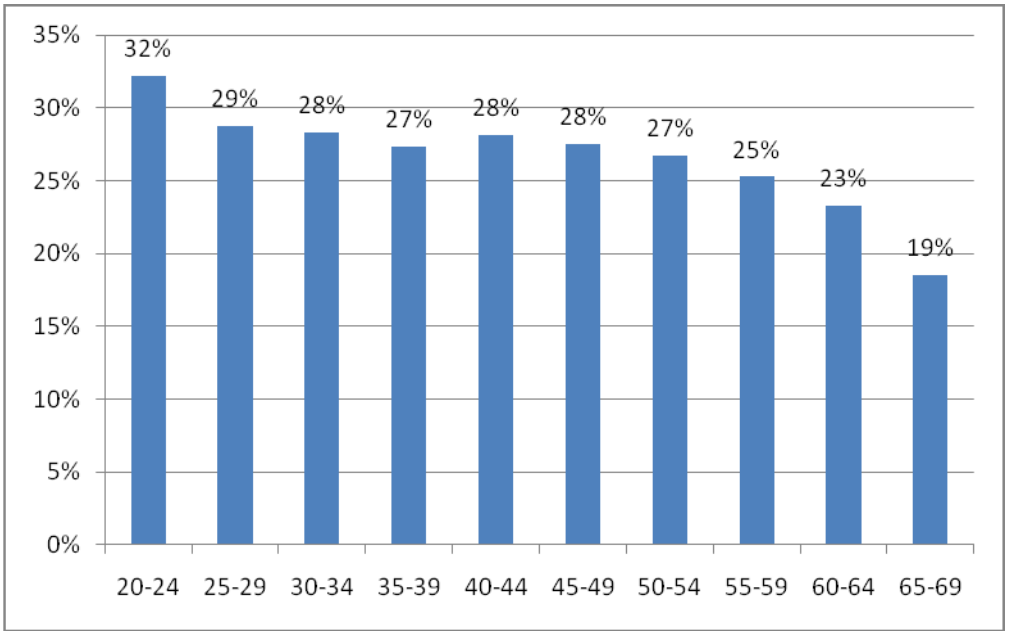
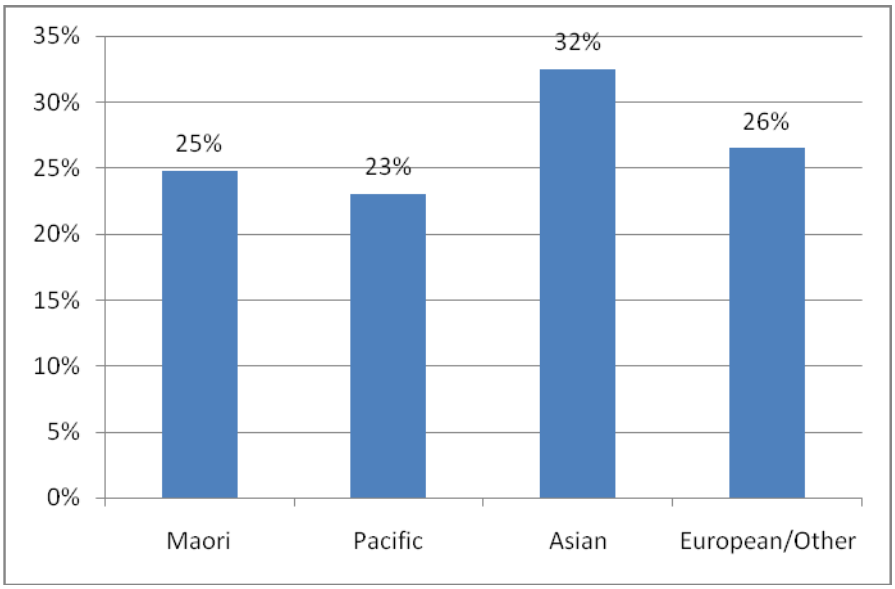


Figure 18 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity



Indicator 5 – Laboratory indicators

The indicators include cytology and 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. In future, reports will include volumes of HrHPV tests according to NCSP guidelines.

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 reporting period, including conventional and LBC samples. Reporting rates for negative cytology, total abnormal cytology, and other reporting categories are as a percentage of all satisfactory cytology samples.
Target	1-5% of LBC and 1-8% of conventional cytology 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 0.6% of satisfactory samples reported as HSIL (Bethesda HS1 or HS2)
Current Situation	Nine laboratories reported on cytology taken during this reporting period. A total of 220,612 cytology samples were taken, 99.3% of which were liquid-based cytology (LBC), 0.6% were conventional cytology, and 0.1% were a combination

of the two (Table 6). In all laboratories, virtually all samples are LBC. The proportion of cytology samples which were LBC varied from 98.1% (Southern Community Labs Christchurch) to 100.0% (Aotea Pathology Ltd, Diagnostic Medlab Ltd and Pathlab). All laboratories had a very small proportion of samples which were combined samples (maximum 0.3% at Southern Community Labs Dunedin) (Table 6).

Unsatisfactory cytology

4,384 cytology samples (2.0%) were unsatisfactory. These are reported on in more detail in Table 7 and Table 9. The remaining satisfactory samples are reported on in more detail in Table 8, and Table 10 to Table 13.

Nationally, unsatisfactory rates for LBC (2.0%) are lower than for conventional cytology (3.9%), and this is generally the case for all individual laboratories (Table 9). Three laboratories (Aotea Pathology Ltd, Diagnostic Medlab Ltd, and Pathlab) had unsatisfactory rates of 0% for conventional cytology, however they each processed a very small number of conventional samples (one sample in two laboratories, and seven cases in the third).

Four of the nine laboratories had unsatisfactory rates within the target range for LBC. Five laboratories had rates below the 1% lower target (Aotea Pathology Ltd 0.3%, Canterbury Health Laboratories 0.3%, Pathlab 0.2%, Southern Community Labs Christchurch 0.6%, and Southern Community Labs Dunedin 0.7%). Five of the nine laboratories had unsatisfactory rates within the target range for conventional cytology. The remaining four laboratories all processed very small numbers of conventional cytology samples (range 1-32 samples) and so comparison against the targets is not meaningful.

Negative cytology reports

91.9% of cytology results were negative, consistent with the target of no more than 96% (Figure 21, Table 8). The proportion of samples which were negative varied by laboratory from 65.8% (LabPLUS) to 94.5% (Southern Community Labs Christchurch), but all laboratories met the target of no more than 96%.

Abnormal cytology reports

The proportion of samples which were abnormal (8.1%) also fell within the recommended range of no more than 10% (Figure 22, Table 8). This varied widely by laboratory however, from 5.5% (Southern Community Labs Christchurch) to 34.2% (LabPLUS). Two laboratories exceeded the target, although in one case very slightly (LabPLUS 34.2% and Canterbury Health Laboratories 10.4%).

Abnormal cytology results were most common in younger women.

HSIL cytology reports

Overall, 0.8% of cytology samples were HSIL, consistent with the target of at least 0.6% of samples (Figure 23, Table 11). Rates varied by laboratory from 0.3% (Aotea Pathology Ltd) to 5.5% (LabPLUS). One laboratory had rates of HSIL below

target levels (Aotea Pathology Ltd 0.3%).

Rates of HSIL or worse were most common in women aged 25-29 years (Table 12, Table 13).

Trends

Unsatisfactory cytology

The unsatisfactory rate in LBC samples has fallen slightly from 2.3% to 2.0% in the current reporting period. The unsatisfactory rate in conventional cytology samples has decreased from 2.4% in the previous reporting, to 2.0% in the current reporting period.

The number of laboratories meeting the target for unsatisfactory LBC samples (four of nine laboratories) is one more than in the previous reporting period. The number of laboratories with unsatisfactory rates below the lower target of 1% has remained the same, but there are no longer any laboratories exceeding the upper target of 5% (compared to one in the previous period).

Negative vs abnormal cytology reports

Overall abnormalities have increased slightly since the previous reporting period (from 7.8% to 8.1%), and correspondingly the proportion of cytology samples reported as negative for intraepithelial lesion or malignancy has reduced slightly (from 92.2% to 91.9%). The number of laboratories meeting targets for negative and abnormal samples has remained consistent since the previous reporting period.

HSIL cytology reports

The proportion of cytology samples reported as HSIL has increased slightly from 0.7% to 0.8%. Two additional laboratories have met the target for HSIL rates, as the rate of HSIL samples has risen slightly at Diagnostic Medlab Ltd and at Southern Community Labs Christchurch.

Comments

As a result of funding and guideline changes, the proportion of cytology samples which are LBC has continued to increase since the previous reporting period, from 89.6% to 99.3%.

High rates of abnormal samples from LabPLUS are consistent with previous reports, and it is thought that the case-mix of this laboratory (ie a higher proportion of samples received from colposcopy clinics compared to other laboratories) is a factor underlying the observed higher rate for this laboratory. In the current monitoring period, the number of cytology slides received at this laboratory dropped by approximately half (from 9,227 to 4,649). Further analysis ascertained that a number of health facilities sent samples to LabPLUS in the previous period but not in the current monitoring period, and these generally appeared to be ones which are more likely to be conducting primary screening smears. In addition, the number of samples received by LabPLUS which appear

to have been sent from colposcopy or hospital-based clinics has increased compared to the previous monitoring period. Thus it appears that the case-mix at LabPLUS has very likely changed such that an even higher proportion of samples are received from colposcopy clinics compared to community-based clinics than was previously the case. This is likely to underlie their substantially higher rates of abnormal cytology.

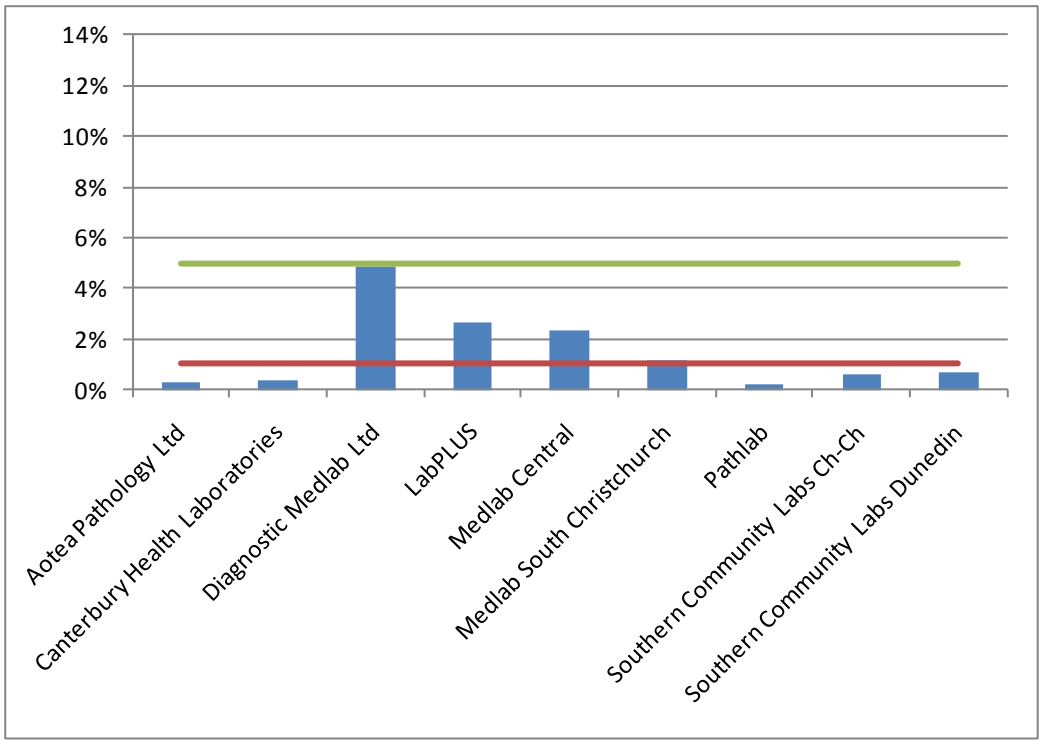
Two other laboratories have also had substantial changes to the number of samples received since the previous monitoring period. Southern Community Labs Christchurch received 51,156 cytology samples in the current monitoring period, compared to 10,146 samples in the previous monitoring period. Southern Community Labs Dunedin received 13,192 cytology samples in the current monitoring period, compared to 42,906 samples in the previous period. It is believed that these findings may be due to a data entry error in the NCSP Register (but this could not be directly investigated).

The target for unsatisfactory cytology applies to both types of LBC (ThinPrep and SurePath). It is uncertain if this is applicable, as the techniques used to produce slides from the liquid samples differ between test technologies - ThinPrep is a filtration-based method, whereas SurePath is a centrifugation-based method. There is limited evidence on the appropriate lower level for unsatisfactory cytology using SurePath, however results from a pooled analysis suggest that unsatisfactory rates may differ between the technologies[4]. Use of different LBC test technologies by different laboratories may be a factor in the variation in rates of unsatisfactory cytology (it is believed that all laboratories with unsatisfactory rates below 1% for LBC use SurePath). The target for unsatisfactory LBC samples will be reviewed as more evidence becomes available.

Southern Community Labs Christchurch ceased reporting on cytology in July 2010.

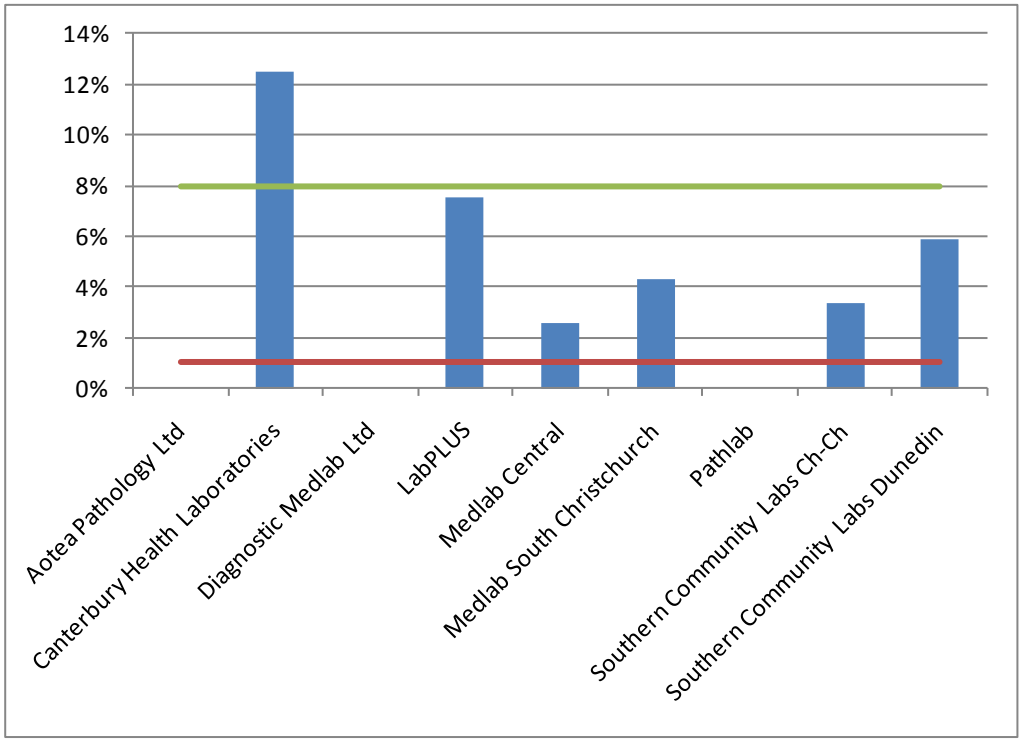
[4] Krahn, M., McLachlin M., *et al*. 2008. *Liquid-based techniques for cervical cancer screening: systematic review and cost-effectiveness analysis*. Technology report number 103. Ottawa: Canadian Agency for Drugs and Technologies in Health.

Figure 19 - Proportion of total LBC samples reported as unsatisfactory by laboratory, 1 January to 30 June 2010 (Green line=upper target limit; red line=lower target limit)



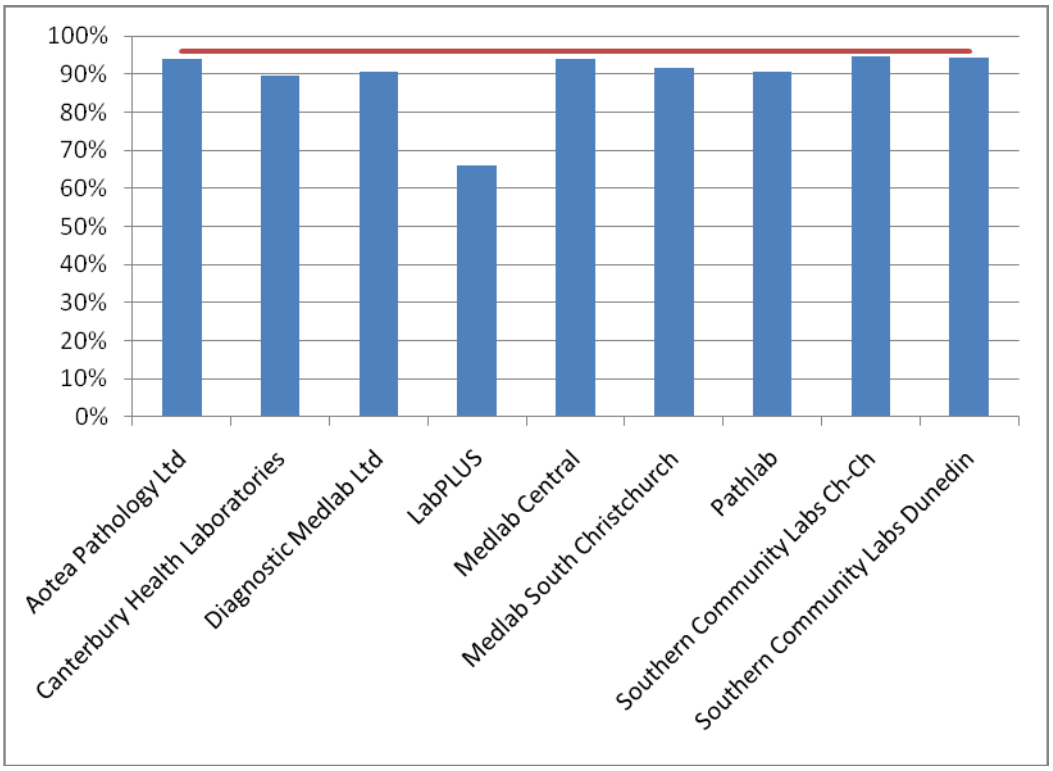
Target for LBC: 1-5%

Figure 20 - Proportion of total conventional cytology samples reported as unsatisfactory by laboratory, 1 January to 30 June 2010 (Green line=upper target limit; red line=lower target limit)



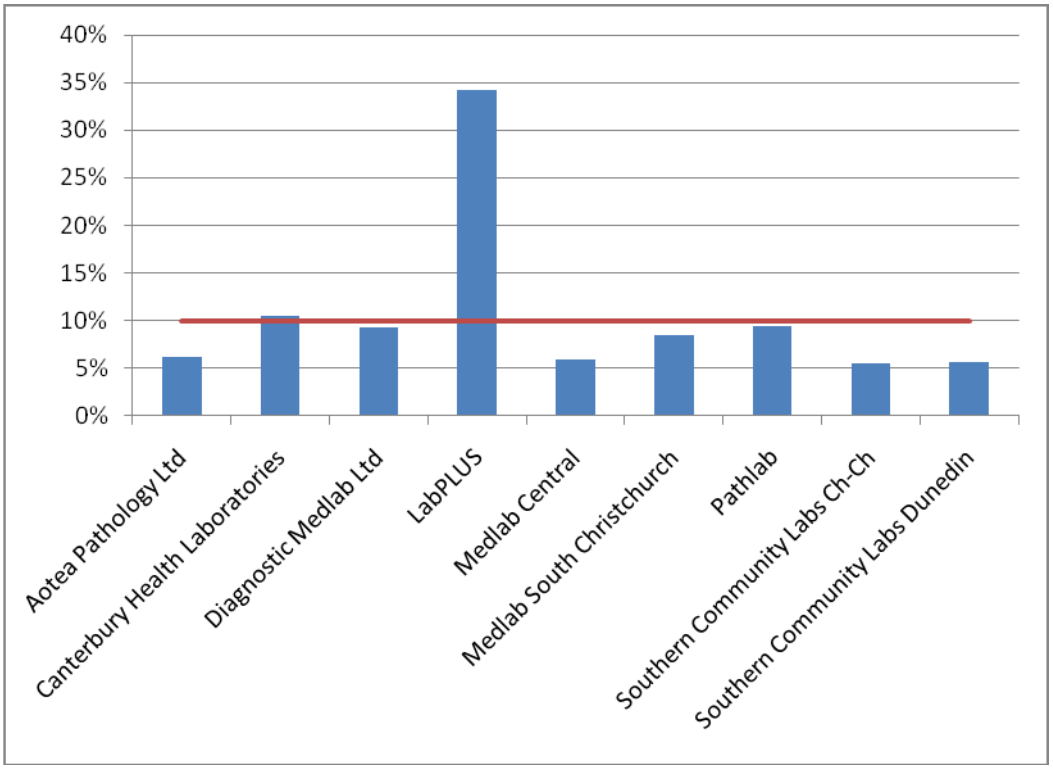
Target for conventional cytology: 1-8%
Fewr than 50 samples were received by Aotea Pathology Ltd, Canterbury Health Laboratories, Diagnostic Medlab Ltd, and LabPLUS, Pathlab – see Table 9.

Figure 21 - Proportion of total satisfactory samples reported as negative by laboratory, 1 January to 30 June 2010



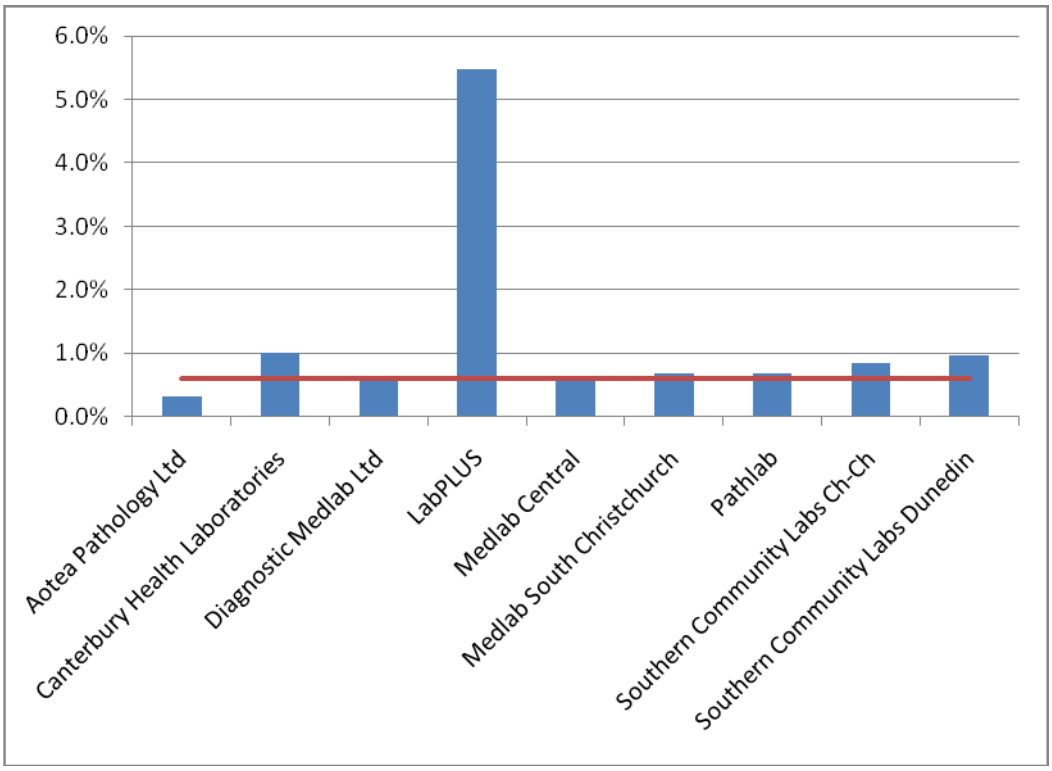
Note: Line shows negative target ≥ 96%

Figure 22 - Proportion of total satisfactory samples reported as abnormalities by laboratory, 1 January to 30 June 2010 (red line=target)



Note: Line shows abnormal target ≤ 10%

Figure 23 - Proportion of samples reported as HSIL for each laboratory, 1 January to 30 June 2010 (red line=target)



Note: Line shows HSIL target ≥ 0.6%

Table 6 - Laboratory cytology reporting by type of cytology sample (1 January to 30 June 2010)

Organisation	All samples	By cytology sample type					
		LBC		Conventional		Combined	
	N	N	%	N	%	N	%
Aotea Pathology Ltd	21,948	21,947	100.0	1	0.0	-	0.0
Canterbury Health Laboratories	11,957	11,917	99.7	32	0.3	8	0.1
Diagnostic Medlab Ltd	62,606	62,598	100.0	7	0.0	1	0.0
LabPLUS	4,649	4,608	99.1	40	0.9	1	0.0
Medlab Central	18,249	18,020	98.7	192	1.1	37	0.2
Medlab South Christchurch	16,680	16,605	99.6	70	0.4	5	0.0
Pathlab	20,175	20,174	100.0	1	0.0	-	0.0
Southern Community Labs Ch-Ch	51,156	50,167	98.1	884	1.7	105	0.2
Southern Community Labs Dunedin	13,192	12,984	98.4	171	1.3	37	0.3
TOTAL	**220,612**	**219,020**	**99.3**	**1,398**	**0.6**	**194**	**0.1**

Notes:
Includes all samples (satisfactory and unsatisfactory)
Target total samples: ≥ 15,000 per annum
LBC refers to both ThinPrep and SurePath samples
Combined refers to instances where both conventional cytology and LBC were used

Table 7 - Satisfactory and unsatisfactory cytology reporting by laboratory (1 January to 30 June 2010)

Laboratory	All Samples N	Satisfactory N	Satisfactory %	Unsatisfactory N	Unsatisfactory %
Aotea Pathology Ltd	21,948	21,888	99.7	60	0.3
Canterbury Health Laboratories	11,957	11,913	99.6	44	0.4
Diagnostic Medlab Ltd	62,606	59,572	95.2	3,034	4.8
LabPLUS	4,649	4,523	97.3	126	2.7
Medlab Central	18,249	17,819	97.6	430	2.4
Medlab South Christchurch	16,680	16,480	98.8	200	1.2
Pathlab	20,175	20,129	99.8	46	0.2
Southern Community Labs Ch-Ch	51,156	50,811	99.3	345	0.7
Southern Community Labs Dunedin	13,192	13,093	99.2	99	0.8
Total	**220,612**	**216,228**	**98.0**	**4,384**	**2.0**

See also Table 9 *for results by type of cytology sample*

Table 8 - Laboratory cytology reporting by general result (1 January to 30 June 2010)

Laboratory	Negative N	Negative %	Abnormal N	Abnormal %
Aotea Pathology Ltd	20,539	93.8	1,349	6.2
Canterbury Health Laboratories	10,672	89.6	1,241	10.4
Diagnostic Medlab Ltd	54,037	90.7	5,535	9.3
LabPLUS	2,978	65.8	1,545	34.2
Medlab Central	16,770	94.1	1,049	5.9
Medlab South Christchurch	15,092	91.6	1,388	8.4
Pathlab	18,225	90.5	1,904	9.5
Southern Community Labs Ch-Ch	48,009	94.5	2,802	5.5
Southern Community Labs Dunedin	12,348	94.3	745	5.7
Total	**198,670**	**91.9**	**17,558**	**8.1**

Target total negative: ≤ 96% of satisfactory samples reported as negative
Target total abnormal: ≤ 10% of satisfactory samples reported as abnormal

Table 9 - Laboratory reporting of unsatisfactory results by type of cytology sample (1 January to 30 June 2010)

	Conventional			LBC			Combined			TOTAL		
Laboratory	**Unsat**	**Total**	**%**	**Unsat**	**Total**	**%**	**Unsat**	**Total**	**%**	**Unsat**	**Total**	**%**
Aotea Pathology Ltd	-	1	0.0	60	21,947	0.3	-	-	-	60	21,948	0.3
Canterbury Health Laboratories	4	32	12.5	40	11,917	0.3	-	8	0.0	44	11,957	0.4
Diagnostic Medlab Ltd	-	7	0.0	3,034	62,598	4.8	-	1	0.0	3,034	62,606	4.8
LabPLUS	3	40	7.5	123	4,608	2.7	-	1	0.0	126	4,649	2.7
Medlab Central	5	192	2.6	424	18,020	2.4	1	37	2.7	430	18,249	2.4
Medlab South Christchurch	3	70	4.3	197	16,605	1.2	-	5	0.0	200	16,680	1.2
Pathlab	-	1	0.0	46	20,174	0.2	-	-	0.0	46	20,175	0.2
Southern Community Labs Ch-Ch	30	884	3.4	315	50,167	0.6	-	105	0.0	345	51,156	0.7
Southern Community Labs Dunedin	10	171	5.8	88	12,984	0.7	1	37	2.7	99	13,192	0.8
Total	**55**	**1,398**	**3.9**	**4,327**	**219,020**	**2.0**	**2**	**194**	**1.0**	**4,384**	**220,612**	**2.0**

Target unsatisfactory: 1-8% conventional cytology; 1-5% LBC

Table 10 - Laboratory cytology reporting by cytological category (1 January to 30 June 2010) – counts

	Result									
Laboratory	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
Aotea Pathology Ltd	20,539	426	767	68	71	1	10	4	2	**21,888**
Canterbury Health Laboratories	10,672	396	572	133	119	3	15	2	1	**11,913**
Diagnostic Medlab Ltd	54,034	1,960	2,843	320	353	3	48	7	1	**59,572**
LabPLUS	2,978	476	524	245	248	3	39	7	3	**4,523**
Medlab Central	16,770	283	560	88	103	2	10	3	-	**17,819**
Medlab South Christchurch	15,092	559	550	149	112	1	16	1	-	**16,480**
Pathlab	18,225	590	997	142	139	1	33	2	-	**20,129**
Southern Community Labs Ch-Ch	48,009	602	1,610	122	432	1	26	9	-	**50,811**
Southern Community Labs Dunedin	12,348	151	440	21	126	1	4	2	-	**13,093**
Total	**198,670**	**5,443**	**8,863**	**1,288**	**1,703**	**16**	**201**	**37**	**7**	**216,228**

Table 11 - Laboratory cytology reporting by cytological category (1 January to 30 June 2010) - percentage of all satisfactory samples

	Percentage of Laboratory's Result								
Laboratory	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**
Aotea Pathology Ltd	93.8	1.9	3.5	0.3	0.3	0.00	0.05	0.02	0.0
Canterbury Health Laboratories	89.6	3.3	4.8	1.1	1.0	0.03	0.13	0.02	0.01
Diagnostic Medlab Ltd	90.7	3.3	4.8	0.5	0.6	0.01	0.08	0.01	0.00
LabPLUS	65.8	10.5	11.6	5.4	5.5	0.07	0.86	0.15	0.07
Medlab Central	94.1	1.6	3.1	0.5	0.6	0.01	0.06	0.02	-
Medlab South Christchurch	91.6	3.4	3.3	0.9	0.7	0.01	0.10	0.01	-
Pathlab	90.5	2.9	5.0	0.7	0.7	0.00	0.16	0.01	-
Southern Community Labs Ch-Ch	94.5	1.2	3.2	0.2	0.9	0.00	0.05	0.02	-
Southern Community Labs Dunedin	94.3	1.2	3.4	0.2	1.0	0.001	0.03	0.02	-
Total	**91.9**	**2.5**	**4.1**	**0.6**	**0.8**	**0.01**	**0.09**	**0.02**	**0.00**

Target HSIL: ≥ 0.6% of satisfactory samples reported as HSIL

Table 12 - Laboratory reporting of cytological category by five-year age group (1 January to 30 June 2010) – counts

	Cytology Result									
Age Group	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
<20	2,154	148	439	27	20	-	-	-	-	**2,788**
20-24	21,471	1,194	3,040	374	400	-	5	2	-	**26,486**
25-29	20,396	781	1,581	261	399	-	16	1	-	**23,435**
30-34	21,910	615	952	174	282	-	21	-	1	**23,955**
35-39	25,429	610	821	127	220	2	21	1	-	**27,231**
40-44	24,991	591	649	93	133	2	27	3	1	**26,490**
45-49	24,307	579	542	58	114	2	22	3	-	**25,627**
50-54	19,768	423	329	51	52	5	31	7	-	**20,666**
55-59	15,589	218	254	49	40	1	23	2	1	**16,177**
60-64	12,557	161	148	34	22	2	10	9	1	**12,944**
65-69	8,153	89	82	26	18	1	10	3	-	**8,382**
70+	1,945	34	26	14	3	1	15	6	3	**2,047**
Total	**198,670**	**5,443**	**8,863**	**1,288**	**1,703**	**16**	**201**	**37**	**7**	**216,228**

Table 13 - Laboratory reporting of cytological category by five-year age group (1 January to 30 June 2010) - percentage of all satisfactory samples in women that age group

	Percentage of Age Group Total								
Age Group	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**
<20	77.3	5.3	15.7	1.0	0.7	0.00	0.00	0.00	0.00
20-24	81.1	4.5	11.5	1.4	1.5	0.00	0.02	0.01	0.00
25-29	87.0	3.3	6.7	1.1	1.7	0.00	0.07	0.00	0.00
30-34	91.5	2.6	4.0	0.7	1.2	0.00	0.09	0.00	0.00
35-39	93.4	2.2	3.0	0.5	0.8	0.01	0.08	0.00	0.00
40-44	94.3	2.2	2.4	0.4	0.5	0.01	0.10	0.01	0.00
45-49	94.8	2.3	2.1	0.2	0.4	0.01	0.09	0.01	0.00
50-54	95.7	2.0	1.6	0.2	0.3	0.02	0.15	0.03	0.00
55-59	94.4	1.3	1.6	0.3	0.2	0.01	0.14	0.01	0.01
60-64	97.0	1.2	1.1	0.3	0.2	0.02	0.08	0.07	0.01
65-69	97.3	1.1	1.0	0.3	0.2	0.01	0.12	0.04	0.00
70+	95.0	1.7	1.3	0.7	0.1	0.05	0.73	0.29	0.15
Total	**91.9**	**2.5**	**4.1**	**0.6**	**0.8**	**0.01**	**0.09**	**0.02**	**0.00**

Indicator 5.2 – Accuracy of cytology predicting HSIL

Definition

The accuracy of cytology predicting HSIL (positive predictive value; PPV) is defined as the probability of a high grade histological report (CIN2/3) or higher, given an HSIL/invasive squamous carcinoma cytology report.

Refer to Appendix D for detailed definitions.

Target

Not less than 65% and not greater than 85%

Current Situation

All satisfactory cytology samples collected in the six months prior to the current reporting period (ie collected from 1 July 2009 until 31 December 2009 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 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 report. Where there were multiple histology reports for a woman in the defined period, the most serious abnormality category was used.

HSIL+SC

1,426 women with HSIL or SC cytology reports were identified. 132 of these women (9.3%) had no histology taken in the period from five days prior to six months after the cytology sample was taken. Among the remaining 1,294 for whom there was histology, 1,080 (83.5%) had their HSIL/SC cytology confirmed by histology (refer to Appendix C for definition of histological confirmation) (Figure 24, Table 46).

All laboratories achieved the minimum target of at least 65% of cytological HSIL +SC being confirmed by histology. Four laboratories exceeded 85% of HSIL+SC being histologically confirmed, although in one case very slightly. They were Canterbury Health Laboratories (90.0%), LabPLUS (90.8%), Medlab Central (85.7%) and Southern Community Labs - Christchurch (90.0%) (Figure 24, Table 46).

Other cytological abnormalities

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

ASC-H

1,045 women with a cytology report of ASC-H were identified. 229 (21.9%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 816 women, 423 (51.8%) were histologically confirmed as high grade. This proportion varied by laboratory,

from 46.0% (Southern Community Labs - Dunedin) to 69.2% (Canterbury Health Laboratories) (Figure 25, Table 47).

ASC-H+HSIL+SC

A total of 2,471 women had a cytology report of ASC-H, HSIL or SC. 361 (14.6%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 2,110 women, 1,503 (71.2%) were histologically confirmed as high grade. This proportion varied by laboratory, from 63.7% (Medlab South Christchurch) to 78.9% (Canterbury Health Laboratories). The combined positive predictive value across the 2,110 women with ASC-H, HSIL, and SC and histology available is shown in Figure 25 and Table 48.

Glandular abnormalities

246 women with a glandular abnormality (AG1-AG5, AIS, AC1-AC4) were identified. 85 women (34.6%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 161 women, 69 (42.9%) had their high grade histologically confirmed. This was not analysed further, as the number of samples reported on by many laboratories was too small to be meaningful.

Trends

HSIL+SC

Positive predictive value for HSIL and SC cytology has remained virtually unchanged since the previous monitoring report (83.6% in the previous period; 83.5% in the current period). As in the previous monitoring period, all laboratories had at least 65% of their HSIL + SC cytology results confirmed by histology, and four laboratories had PPVs above the upper target of 85%. The proportion of cytology reports with histology available has decreased slightly for HSIL or SC (91.2% in the previous report; 90.7% in the current report).

ASC-H

Positive predictive value for ASC-H cytology has increased slightly, from 51.0% to 51.8%, however there is no target for this measure. The proportion of cytology reports with histology available has decreased slightly for ASC-H (from 78.6% to 78.1%).

ASC-H+HSIL+SC

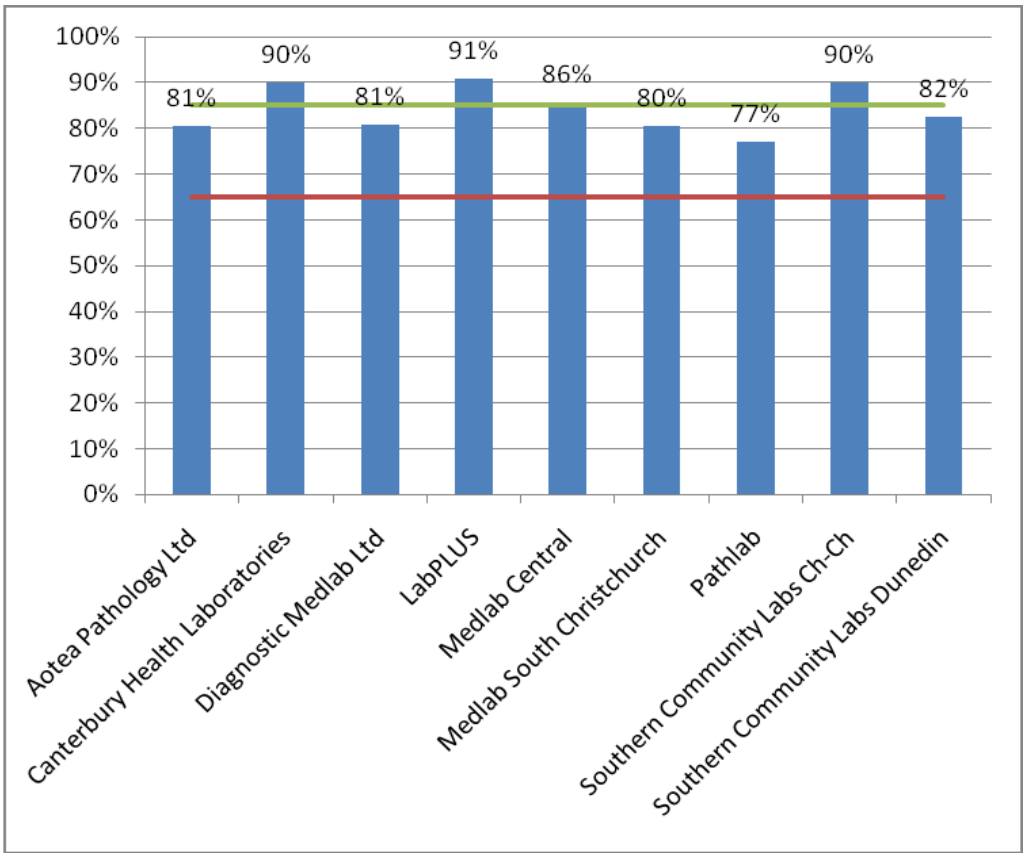
The positive predictive value for the combined group ASC-H, HSIL and SC increased between the previous report (70.2%) and the current report (71.2%), however there are no targets for the positive predictive value of the combined group of ASC-H, HSIL and SC.

Glandular abnormalities

The positive predictive value of glandular abnormalities decreased (from 45.1% in the previous report to 42.9% in the current report). Compared to both ASC-H

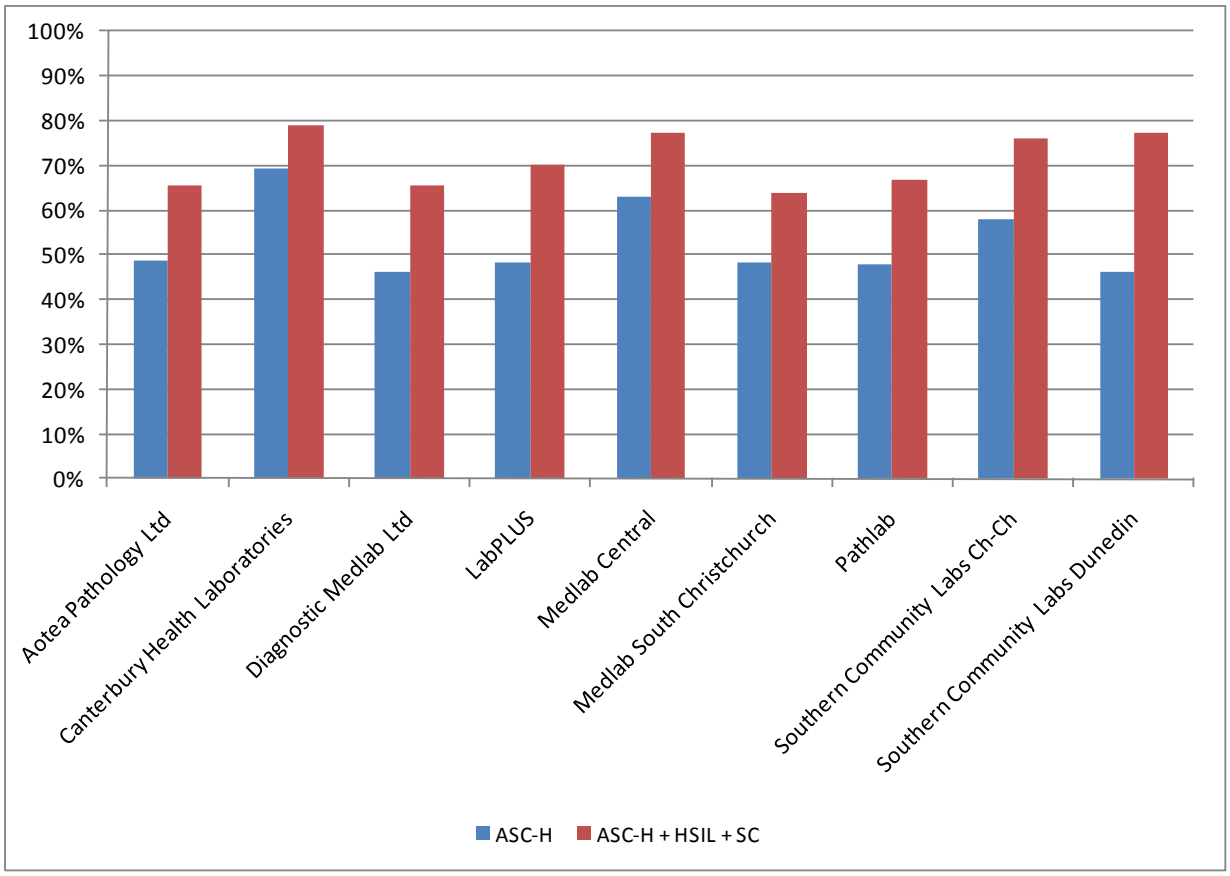
	cytology, and the combined group of HSIL and SC cytology, there are far fewer glandular abnormalities, and an even smaller number with histology available. The proportion of glandular abnormalities with histology available has decreased (from 73% to 65%), and remains less than that for ASC-H (78%) and HSIL+SC (91%). Due to the small number of samples involved, glandular abnormalities were not analysed in further detail.
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 it may not be taken if the colposcopic impression is normal. When more colposcopy data is available on the NCSP Register, it may be possible to better distinguish between these two possibilities. 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 which 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 PPV (and other reporting categories) in a screening setting.

Figure 24 - Positive predictive value for CIN2+ in women with HSIL or SC cytology reports by laboratory, 1 January to 30 June 2010



Target: 65% - 85%

Figure 25 - Positive predictive value for CIN2+ in women with other high grade cytology results, by laboratory 1 January to 30 June 2010



Target: None

Indicator 5.3 – Accuracy of negative cytology reports

Definition	This indicator is under development and currently has two parts to its definition. 1. The percentage of negative cytology samples (excluding unsatisfactory samples which are reported separately) with subsequent high grade or worse histology that are upgraded to high grade or worse category following slide review. 2. The ability of a laboratory to correctly identify a negative sample.
Current Situation	Data required for this measure was not available from the NCSP Register for the current reporting period. While some data are provided by laboratories to the NCSP, methodology is not consistent between laboratories. As a result of these methodological differences, it was considered that comparisons should not be made between laboratories.

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 this 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 for the ranking used). 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. The Ministry of Health holds the New Zealand licence for SNOMED CT and the NCSP is in the early stages of investigating its use. A woman's age is defined as her age at the end of the reporting period.
Target	None
Current Situation	12,465 histology samples were taken during the current reporting period. 306 (2.5%) of these were insufficient for diagnosis. The remaining 12,159 samples were taken from 10,743 women. Results for these women are reported on in detail in Table 14 - Table 17. The 306 samples which were insufficient for diagnosis were taken from 301 women, 59 (19.6%) of whom have a record of a subsequent histology test (to the date of the data download for this report, ie 1 March 2011). 53.5% of women with histology tests had negative or benign histology results (Table 14, Table 15). 20.9% of women had high grade squamous (ie CIN2, CIN3, or HSIL not otherwise specified) histology results. 44 (0.4%) women had histology results which were invasive squamous cell carcinoma (ISCC), six (0.1%) which were microinvasive SCC, 57 (0.5%) which were invasive adenocarcinoma, one (<0.05%) which was adenosquamous carcinoma and 23 (0.2%) which were adenocarcinoma in situ. The age group with the largest number of women with histology samples was women aged 20-24 years (1,508 women, Table 16). This was also the age group with the lowest rate of women with results which were negative or HPV only 32% (Table 17).
Trends	The proportion of women with negative or benign histology (53.5%) is similar to that reported for the previous period (January-June 2009; 55%). The proportions were also similar to those in the previous period for women with high grade squamous (20.9% this period; 20.8% last period), ISCC (0.4% in both periods), invasive adenocarcinoma (0.5% this period; 0.4% last period), adenosquamous

	carcinoma (<0.05% in both periods), and adenocarcinoma in situ (0.2% this period; 0.3% last 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. This is likely to be contributing to the higher number of women with adenocarcinoma histology on the NCSP Register compared to the Cancer Registry.

Table 14 - Histology results reporting by SNOMED category

SNOMED category	Women with that diagnosis	
	N	%
Negative/normal	2,779	25.9
Inflammation	787	7.3
Microglandular hyperplasia	4	0.04
Squamous metaplasia	479	4.5
Atypia	75	0.7
HPV	883	8.2
Condyloma acuminatum	5	<0.05
Dysplasia/CIN NOS	111	1.0
CIN 1 (LSIL) or VAIN 1	1,515	14.1
CIN 2 (HSIL) or VAIN 2	601	5.6
CIN 3 (HSIL) or VAIN 3	890	8.3
HSIL Not Otherwise Specified	755	7.0
Polyp	1,055	9.8
Other	637	5.9
Microinvasive squamous cell carcinoma	6	0.1
Invasive squamous cell carcinoma	44	0.4
Benign glandular atypia	3	<0.05
Glandular dysplasia	-	-
Adenocarcinoma in situ	23	0.2
Invasive adenocarcinoma	57	0.5
Adenosquamous carcinoma	1	<0.05
Metastatic tumour	8	0.1
Undifferentiated carcinoma	1	<0.05
Sarcoma	1	<0.05
Carcinosarcoma	1	<0.05
Choriocarcinoma	-	-
Miscellaneous primary tumour	3	<0.05
Small cell carcinoma	1	<0.05
Malignant tumour, small cell type	1	<0.05
Melanoma	-	-
Other primary epithelial malignancy	17	0.2
Total	**10,743**	**100%**

HSIL Not Otherwise Specified = CIN2/3 (SNOMED code M67017; see Appendix C)

Table 15 - Histology results reporting by diagnostic group

Histology diagnosis category	Women with that histology result	
	N	%
Negative/benign (non neoplastic)	5,744	53.5
HPV	888	8.3
CIN1	1,701	15.8
CIN2	601	5.6
CIN3	890	8.3
HSIL Not Otherwise Specified	755	7.0
Microinvasive	6	0.06
Invasive squamous cell carcinoma	44	0.4
Glandular dysplasia	-	-
Adenocarcinoma in situ	23	0.2
Invasive adenocarcinoma	57	0.5
Adenosquamous carcinoma	1	<0.05
Other cancer	33	0.3
Total	**10,743**	**100%**

HSIL Not Otherwise Specified = CIN 2/3 (SNOMED code M67017; see Appendix C)

Table 16 - Histology results by age – counts

Histology Category	Age group <20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Total
Negative/benign (non neoplastic)	17	319	412	417	649	941	1,075	738	434	289	180	273	5,744
HPV	14	165	123	119	123	113	105	61	31	23	9	2	888
CIN1	30	422	309	267	224	172	130	72	37	19	13	6	1,701
CIN2	6	192	136	91	73	44	30	16	7	4	2	0	601
CIN3	6	208	216	164	117	76	48	25	16	7	4	3	890
HSIL Not Otherwise Specified	4	198	167	137	106	69	36	16	11	3	5	3	755
Microinvasive	0	1	0	1	0	1	2	1	0	0	0	0	6
Invasive SCC	0	0	4	5	4	3	5	5	4	5	3	6	44
Adenocarcinoma in situ	0	1	4	5	6	2	1	0	2	2	0	0	23
Invasive adenocarcinoma	0	1	2	3	3	3	9	5	6	6	11	8	57
Adenosquamous carcinoma	0	0	0	0	0	0	1	0	0	0	0	0	1
Other cancer	0	1	0	1	1	5	2	5	3	2	5	8	33
Total	**77**	**1,508**	**1,373**	**1,210**	**1,306**	**1,429**	**1,444**	**944**	**551**	**360**	**232**	**309**	**10,743**

Table 17 - Histology results by age – women with that histology result, as a percentage of all women in that age group with histology results

Histology 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)	22.1	21.2	30.0	34.5	49.7	65.9	74.4	78.2	78.8	80.3	77.6	88.3
HPV	18.2	10.9	9.0	9.8	9.4	7.9	7.3	6.5	5.6	6.4	3.9	0.6
CIN1	39.0	28.0	22.5	22.1	17.2	12.0	9.0	7.6	6.7	5.3	5.6	1.9
CIN2	7.8	12.7	9.9	7.5	5.6	3.1	2.1	1.7	1.3	1.1	0.9	0.00
CIN3	7.8	13.8	15.7	13.6	9.0	5.3	3.3	2.6	2.9	1.9	1.7	1.0
HSIL Not Otherwise Specified	5.2	13.1	12.2	11.3	8.1	4.8	2.5	1.7	2.0	0.8	2.2	1.0
Microinvasive	-	0.1	-	0.08	-	0.1	0.1	0.1	-	-	-	-
Invasive SCC	-	-	0.3	0.4	0.3	0.2	0.35	0.5	0.7	1.4	1.3	1.9
Adenocarcinoma in situ	-	0.1	0.3	0.4	0.5	0.1	0.1	0	0.4	0.6	0	0
Invasive adenocarcinoma	-	0.1	0.1	0.2	0.2	0.2	0.6	0.5	1.1	1.7	4.7	2.6
Adenosquamous carcinoma	-	-	-	-	-	-	0.1	-	-	-	-	-
Other cancer	-	0.1	-	0.1	0.1	0.3	0.1	0.5	0.5	0.6	2.2	2.6
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**

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, to the date which it is reported to the smear taker or colposcopist. 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 smear takers within seven working days of receipt of the sample and 100% within 15 working days (also Standard 513[5]).

Histology

Laboratories are required to report 90% of final histology results to referring colposcopists within five working days of receipt of the sample and 99% of final histology results within 15 working days of receiving the sample (also Standard 516[5]).

Cytology with associated HPV triage testing

Laboratories are required to report 100% of final cytology tests associated with HPV test results within 15 working days of receiving the sample. These samples form a subset of those considered in the measure for cytology. 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 reporting period (as opposed to *samples collected* in the period, in Indicator 8). It is explicitly restricted to testing of women aged 30 years or more.

Current Situation

Cytology

Nine laboratories received 220,133 cytology samples during the current reporting period. Overall, 84.4% of cytology samples were reported on within seven working days, which is below the target. Nationally, 99.1% were reported on within 15 working days, which is slightly below the target (Table 49).

Four laboratories met the target for 90% of cytology samples to be reported to smear-takers in seven days or less (Diagnostic Medlab Ltd, Medlab Central, Medlab South Christchurch, Southern Community Laboratories - Dunedin), the proportion of samples reported on within seven working days ranged from 16.1% (Aotea Pathology Ltd) to 100.0% (Medlab South Christchurch).

One laboratory met the target of 100% of samples reported within 15 working days (Medlab South Christchurch) (Figure 16, Figure 17, Table 49). Of the remaining eight laboratories, four had reported on over 99% of cytology samples within 15 days (Diagnostic Medlab Ltd, Medlab Central, Southern Community

[5] NCSP Operational Policy and Quality Standards, Section 5

Labs – Christchurch and Southern Community Labs - Dunedin), and all nine laboratories had reported on more than 95% within 15 working days.

Histology

20 laboratories received 12,429 histology samples in the current reporting period. Overall 81.9% of samples were reported on within five working days, and 97.9% were reported on in 15 working days or less. These values are below the targets (Table 50).

Six laboratories met the target of 90% of final histology results to referring colposcopists within five working days of receipt of the sample (Medlab South Christchurch, Medlab Timaru, Memorial Hospital Hastings, North Shore Hospital Laboratory, Northland Pathology Laboratory, Taranaki Medlab) (Figure 18, Table 50). Fifteen laboratories met the target of 99% of final histology results within 15 working days of receiving the sample, and three of the remaining five had reported on at least 95% of samples within 15 days (Figure 19, Table 50).

Cytology with associated HPV triage testing

Nine laboratories received 1,901 cytology samples during the current reporting period which were associated with HPV testing for the purpose of triage of low grade abnormalities. Overall, 79.7% of these cytology samples were reported on within 15 working days, which is below the target. The proportion of HPV tests reported on within 15 days ranged from 8.9% (Aotea Pathology) to 100% (LabPLUS, Medlab South Christchurch)(Figure 30, Table 51). The target of 100% of tests reported within 15 working days was met by two laboratories (LabPLUS, and Medlab South Christchurch). The proportion of cytology reported within 15 days is significantly lower for cytology associated with low grade triage HPV testing (79.7%), compared to cytology overall (99.1%). This is not the case for all laboratories, however. The proportion of cytology tests reported within 15 days are much lower for those cytology tests with an associated HPV triage test at Aotea Pathology, Canterbury Health Laboratories, and Southern Community Labs Christchurch (Figure 30). The proportion of cytology tests reported within 15 days is similar regardless of whether there is an associated HPV triage test at Diagnostic Medlab Ltd, Medlab Central, Medlab South Christchurch, Pathlab and Southern Community Labs Dunedin.

Trends

Cytology

The overall proportion of samples reported on within seven working days decreased in this period, from 92.1% in the previous monitoring period, to 84.4% in the current period. The number of laboratories meeting the cytology turnaround time target of 90% for seven working-days has decreased in the current monitoring period to four of the nine laboratories, compared to five in the previous period. In some laboratories this was due to a transition between manually-read and automation-assisted LBC. The proportion of samples reported on within 15 working days was slightly lower in the current reporting period (99.1%, compared to 99.4% in the previous reporting period), as was the number of laboratories meeting the target (one of nine, compared to two of nine in the previous report). In the current monitoring period all laboratories

had reported on at least 95% of samples within 15 days; in the previous report one laboratory had reported on less than 95% (Auckland LabPLUS; 94.7%).

Histology

Overall, the proportion of histology samples reported on within five working days is lower than it was in the previous reporting period (81.9% during this period compared to 86.6% in the previous report), and the proportion reported on within 15 working days was also slightly lower (97.9%, compared to 98.9% in the previous report). The same number of laboratories met the five-working-days target as did in the previous reporting period, and the number of laboratories who had reported on 99% of samples within 15 days has remained unchanged at 15 in the current reporting period. Two laboratories had reported on less than 95% of samples within 15 days in the current reporting period, compared to none in the previous period.

Cytology with associated HPV triage testing

Turnaround time for cytology with an HPV test has not been reported on in previous biannual monitoring reports.

Comments

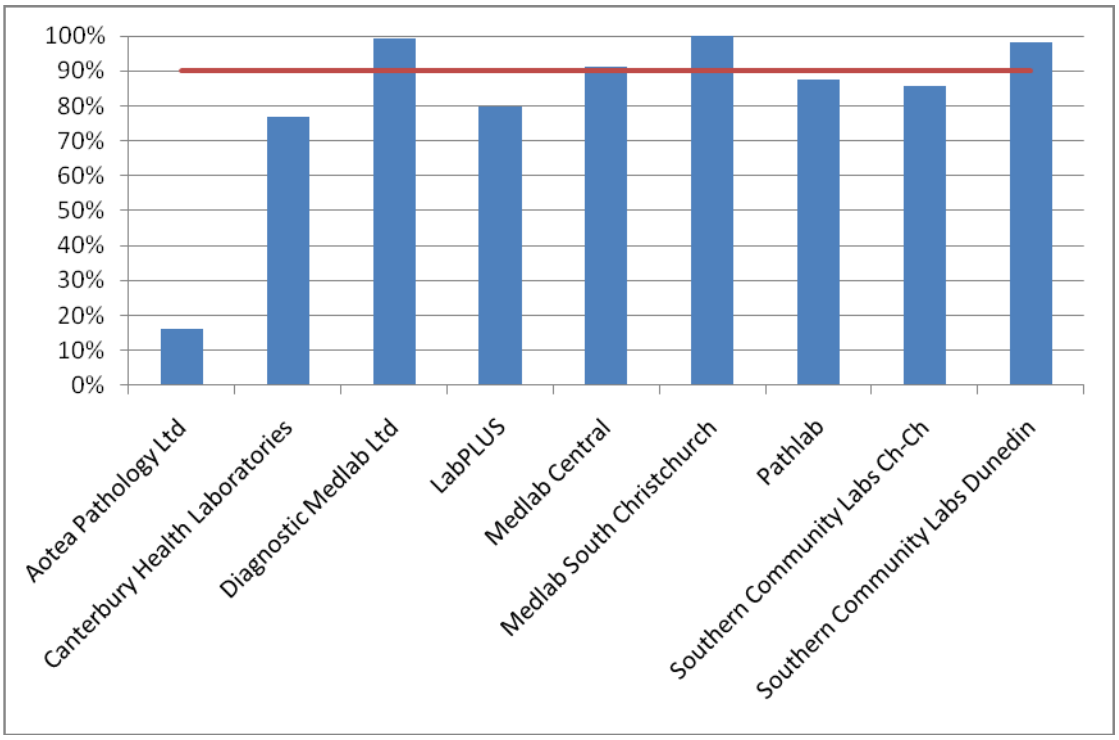
Note that the total number of cytology samples reported on in this Indicator is different from that reported in Indicator 5.1, as the inclusion criteria for the current indicator is all cytology *received by laboratories* within the reporting period, rather than cytology *taken* during the reporting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

When errors are detected in 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 error was resolved. The occurrence of these errors can therefore distort (and lengthen) turnaround time, as the report date recorded in the NCSP Register in these cases does not reflect the date on which results were first communicated to the smear-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.

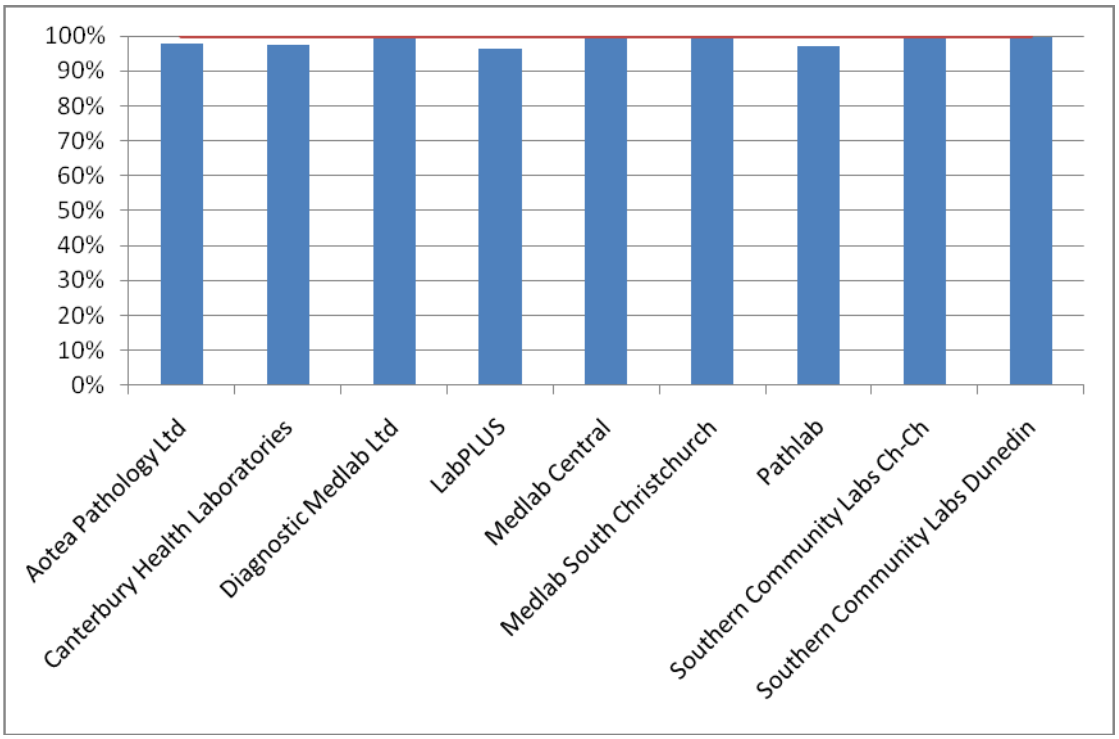
The calculations currently include public holidays which fall on a weekday as working days.

Figure 26 - Proportion of cytology samples reported within seven working days by laboratory, 1 January to 30 June 2010



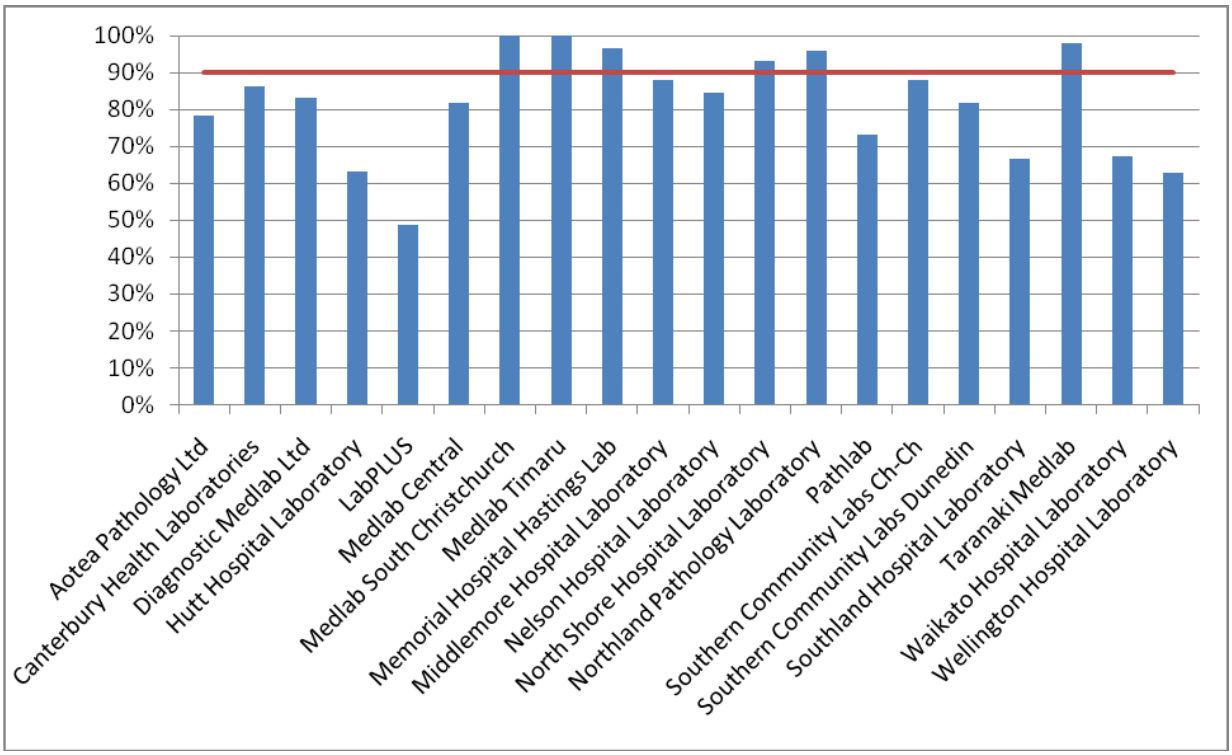
Target: 90 % within seven working days (red line)

Figure 27 - Proportion of cytology samples reported within 15 working days by laboratory, 1 January to 30 June 2010



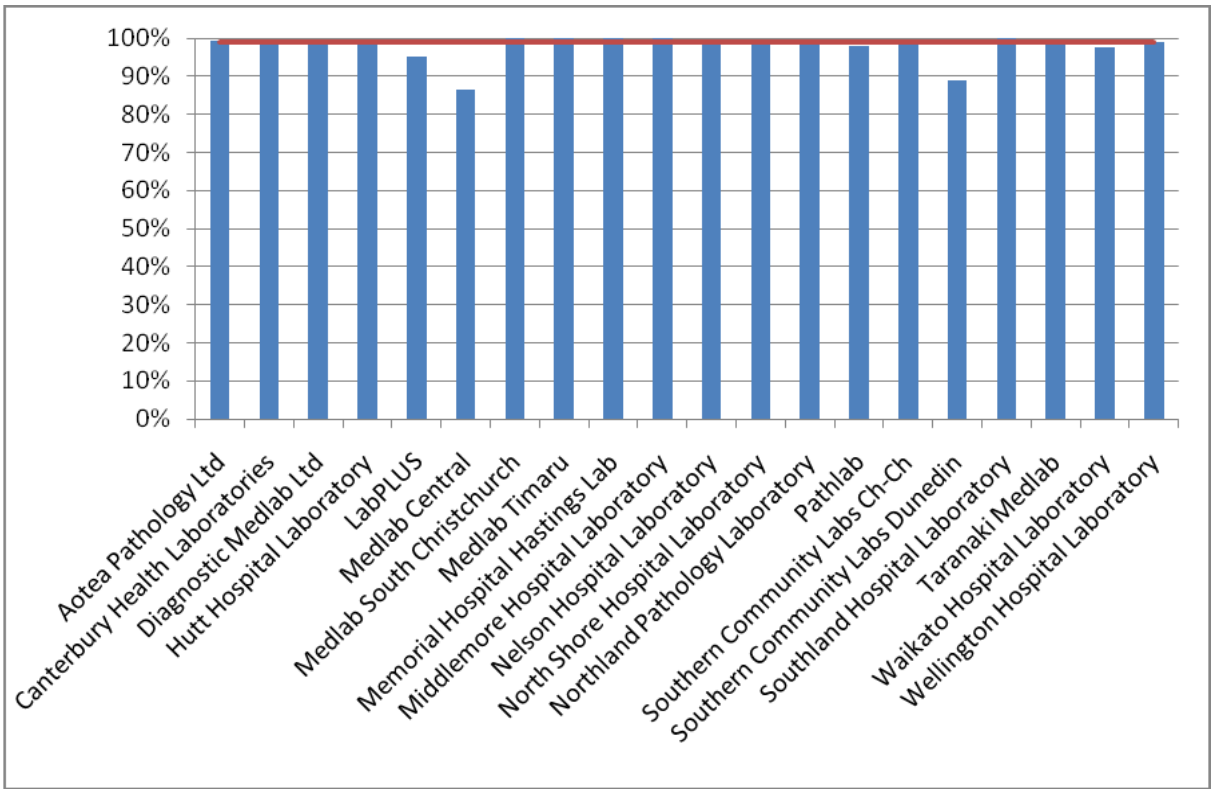
Target: 100% within 15 working days (red line)

Figure 28 - Proportion of histology samples reported within five working days by laboratory, 1 January to 30 June 2010



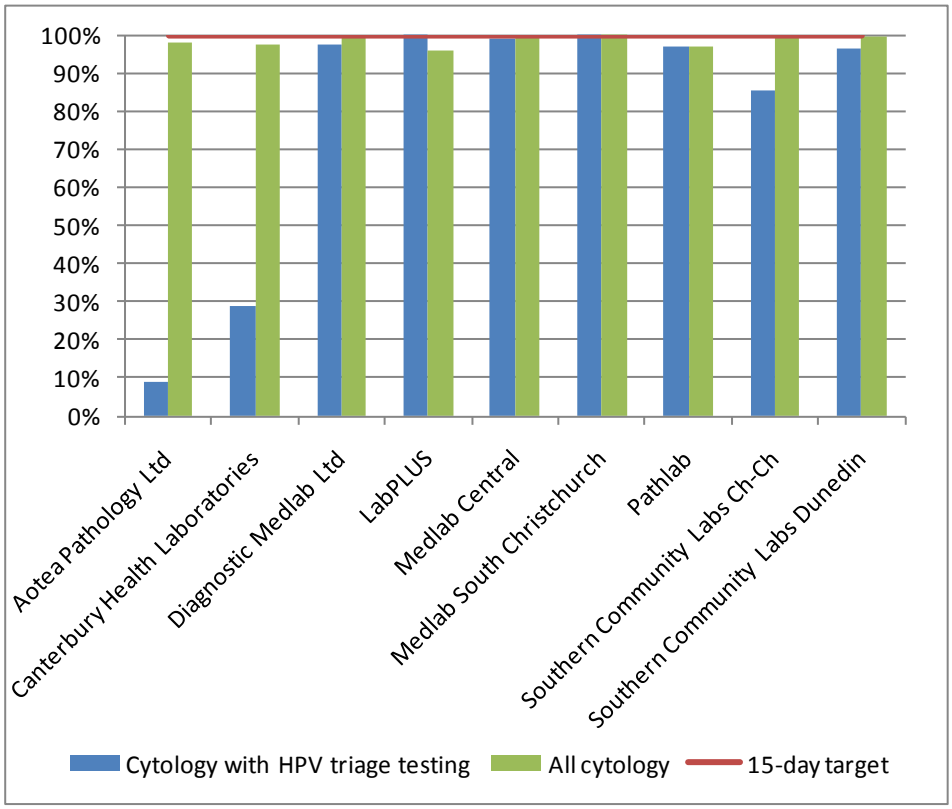
Target: 90% withing five working days (red line)

Figure 29 - Proportion of histology samples reported within 15 working days by laboratory, 1 January to 30 June 2010



Target: 99% within 15 working days(red line)

Figure 30 - Proportion of cytology samples with associated HPV triage testing and of all cytology samples reported within 15 days by laboratory, 1 January to 30 June 2010



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

Definition

The proportion of women (20-69 years) 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 reporting period (ie sample taken from 1 July to 31 December 2009), 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.

In this report, exploratory 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 (2005) interpretation codes are included as high grade cytology: ASH, HS1, HS2, SC, AG1-AG5, AIS, AC1-AC5.

High grade cytology reports which indicated that women were already under specialist management (TBS2001 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 no biopsy taken. The colposcopy visit data for this group of women (Indicator 7.1) will supplement this indicator. As complete data were not available for Indicator 7.1, an exploratory analysis was performed 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, and within 360 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 reporting period (ie 30 June 2010).

Target

90% of women should have a histology report within 90 days of their high grade

cytology report date.

99% of women should have a histology report within 180 days of their high grade cytology report.

Current Situation

There were 3,081 high grade cytology results relating to samples collected in the period 1 July to 31 December 2009; 2,986 in women aged 20-69 years at the end of the period. 854 of these cytology 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 these cytology tests were excluded from this measure. This left 2,132 cytology results, which related to 2,013 women aged 20-69 years at the end of the reporting period. Histological follow-up for these 2,013 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, 1,574 women (78.2%) aged 20-69 years at the end of the period had a histology report within 90 days of their cytology report, and 1,712 (85.0%) had a histology report within 180 days. This is below the targets of 90% within 90 days and 99% within 180 days.

The proportion of women with a histology report within 90 days of their cytology report varied by DHB from 60.0% (South Canterbury) to 90.3% (Otago). By 180 days this had increased to 66.7% (Southland) to 96.5% (Otago) (Figure 31, Table 52). Otago was the only DHB to meet the target for the proportion of women with histology within 90 days; no DHB met the target for 180 days.

The proportion of women with a histology report also varies by age, from 61.8% (ages 65-69 years) to 83.4% (ages 40-44 years) within 90 days, and from to 69.4% (ages 55-59 years) to 87.4% (ages 45-49 years) within 180 days (Table 53). The targets were not met in any age group nationally.

There was some variation in the proportion of women with histological follow-up by ethnicity, however the targets were not met for any group of women nationally. At 90 days, it ranged from 69.3% (Māori) to 80.9% (European/Other). By 180 days, however, the difference had narrowed slightly, and histology reports were available for 79.3% of Māori women and 86.6% of European/ Other women (Table 18, Table 19).

Further breakdown by DHB and ethnicity is shown in Table 18 and Table 19, and breakdown by DHB and age is shown in Table 20 and Table 21.

Women with no follow-up tests

When follow-up tests of any kind (colposcopy, histology, an HPV test, or a subsequent cytology test) were considered, there remained 135 women (6.7%) who had no record of any subsequent follow-up within 180 days on the NCSP

Register, and 81 women (4.0%) who had no record of a follow-up test at 360 days (Figure 32, Table 54).

This varied by DHB at 180 days from 0.0% (Wairarapa) to 10.9% (Tairawhiti), and at 360 days from 0.0% (Northland, South Canterbury, Wairarapa, West Coast) to 8.1% (Auckland). It also varied by ethnicity, from 5.3% (European/Other ethnic groups) to 10.8% (Māori) at 180 days, and from 3.0% (European/Other ethnic groups) to 8.0% (Pacific) at 360 days.

Trends

Histological follow-up

The proportion of women with a histology report within 90 days and within 180 days has decreased slightly, from 78.6% within 90 days in the previous reporting period to 78.2% in the current period, and from 86.0% within 180 days in the previous period to 85.0% in the current period.

While the proportion of women with histological follow-up has decreased slightly overall, a number of DHBs have increased the proportion of women with histological follow-up at 90 days (Hawkes Bay, Mid Central, Northland, Otago, Tairawhiti, Wairarapa) and at 180 days (Hawkes Bay, Northland, Otago, Tairawhiti), often quite substantially. In a smaller number of DHBs, the proportion of women with histological follow-up decreased noticeably (South Canterbury, West Coast, Waitemata, Whanganui). Changes in other DHBs were smaller.

The proportion of women with follow-up histology has decreased overall in the current monitoring period for Māori women (from 76.0% to 69.3% at 90 days, and from 85.0% to 79.3% at 180 days). Increased rates of follow-up were seen in some DHBs, however. In Counties Manukau the proportion of Māori women with follow-up increased from 58.6% to 77.8% at 90 days, and from 69.0% to 88.9% at 180 days. In Hawkes Bay, the proportion of Māori women with follow-up increased from 69.2% to 83.3% at 90 days, with a small increase from 82.1% to 83.3% at 180 days. The proportion of women with follow-up histology increased for both Pacific and Asian women in the current monitoring period at 90 days (from 57.1% to 71.3% and from 71.7 to 76.6% respectively) and also at 180 days (from 74.3% to 81.6%, and from 82.7% to 85.5% respectively). The proportion of women with follow-up histology remained similar for European/Other women at both 90 days (80.6% last period vs 80.9% this period) and at 180 days (86.9% last period vs 86.6% this period).

As in previous reports, the proportion of women with histological follow-up varies substantially by age, and generally seems to be lower in women aged 50 years or more, than in women younger than 50 years.

Women with no follow-up tests

The proportion of women with no record of a follow-up test at 180 days has increased slightly since the previous period, from 6.2% to 6.7%, but the proportion with no follow-up at 360 days (4.0%) was similar to that in the

previous reporting period (3.9%).

Trends by DHB were complex, but reductions in the proportion of women with no follow-up test recorded were greatest in Canterbury, Hawkes Bay, and Waikato. In each case the decrease seen in the current period follows an increase in the previous period (Report 32), and a decrease in the period prior to that (Report 31), so does not appear to form a trend. Likewise, many of the DHBs with increases in the current period in the proportion of women with no follow-up tests follow previous decreases. Auckland is the only DHB where the proportion of women with no follow-up tests recorded (at both 180 days and 360 days) has increased for the second time.

Trends varied by ethnicity. In the current monitoring period, there were higher proportions of Māori women and Pacific women for whom there was no follow-up test record. In Māori women the proportion of women with no follow-up tests recorded increased from 8.7% to 10.8% at 180 days, and from 3.8% to 6.5% at 360 days. The increase was smaller for Pacific women – it increased from 8.6% to 9.2% at 180 days, and from 7.1% to 8.0% at 360 days. Among Asian women, follow-up improved at 180 days (11.0% with no follow-up tests recorded in the previous period; 9.7% in the current period), but not at 360 days (5.5% with no follow-up tests recorded in the previous period; 6.5% in the current period). The proportion of European/Other women without follow-up at 180 days was very similar (5.2% in the previous period, compared to 5.2% in the current period), and decreased at 360 days (from 3.7% in the previous period, to 3.0% in the current period).

Comments

The proportion of women with a follow-up test of any kind provides useful additional information. While 15.0% of women with high grade cytology reports had no record of a histology report within 180 days, the proportion without a record of a follow-up test of any kind was much lower (6.7%). Consistent with previous monitoring reports, over half of the women with no follow-up histology recorded do have a record of some other follow-up test (colposcopy, cytology or an HPV test). This provides reassurance that the majority of women without histology have not been lost to follow-up.

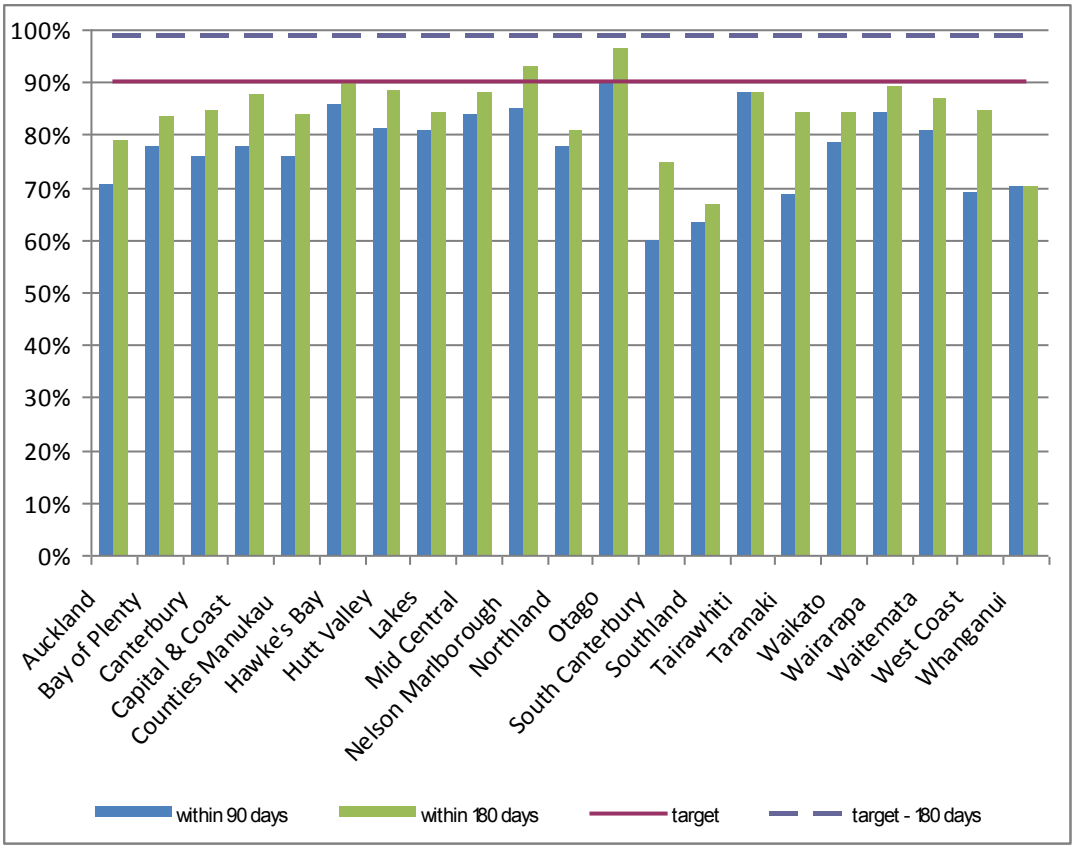
Note that while all *cytology results* which indicated that a woman was under specialist management were excluded from the measure of follow-up, not all *women* who had these cytology results were. If all cytology results for a woman indicated that she was under specialist management, she was excluded. 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 this measure to assess follow-up had Bethesda recommendation codes which 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)/ refusal to attend,
iii) a wait time issue

Risk is also related to the degree of abnormality including microinvasive/invasive carcinoma. Women who do not/ 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 Performance Management Analysts ensure that priority is given to follow-up of these women through DHBs. Risk is also related to the degree of abnormality including microinvasive/invasive carcinoma.

Figure 31 - Proportion of women (ages 20-69 years) 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 18 - Women (ages 20-69 years) 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	8	66.7	10	62.5	20	62.5	84	74.3
Bay of Plenty	17	68.0	4	100.0	4	66.7	66	80.5
Canterbury	13	54.2	1	100.0	5	55.6	178	79.1
Capital & Coast	12	70.6	6	100.0	4	100.0	42	76.4
Counties Manukau	21	77.8	24	64.9	21	75.0	66	80.5
Hawke's Bay	27	75.0	1	100.0	2	100.0	73	90.1
Hutt Valley	7	77.8	3	100.0	2	100.0	31	79.5
Lakes	16	76.2	-	-	-	-	31	83.8
Mid Central	13	81.3	2	100.0	1	100.0	63	84.0
Nelson Marlborough	3	75.0	1	50.0	2	100.0	57	86.4
Northland	21	67.7	1	100.0	1	100.0	30	85.7
Otago	4	100.0	1	50.0	3	100.0	94	90.4
South Canterbury	1	50.0	-	-	-	-	11	61.1
Southland	4	50.0	-	-	2	100.0	34	64.2
Tairawhiti	6	85.7	-	-	-	-	9	90.0
Taranaki	9	64.3	-	-	0	0.0	35	71.4
Waikato	36	64.3	1	100.0	6	85.7	123	83.7
Wairarapa	1	50.0	2	100.0	-	-	13	86.7
Waitemata	19	67.9	5	71.4	22	91.7	111	82.2
West Coast	1	100.0	-	-	-	-	8	66.7
Whanganui	5	62.5	0	0.0	-	-	14	82.4
Total	**244**	**69.3**	**62**	**71.3**	**95**	**76.6**	**1,173**	**80.9**

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

Table 19 - Women (ages 20-69 years) 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	8	66.7	13	81.3	25	78.1	91	80.5
Bay of Plenty	19	76.0	4	100.0	5	83.3	70	85.4
Canterbury	18	75.0	1	100.0	7	77.8	193	85.8
Capital & Coast	14	82.4	6	100.0	4	100.0	48	87.3
Counties Manukau	24	88.9	27	73.0	23	82.1	72	87.8
Hawke's Bay	30	83.3	1	100.0	2	100.0	75	92.6
Hutt Valley	8	88.9	3	100.0	2	100.0	34	87.2
Lakes	17	81.0	-	-	-	-	32	86.5
Mid Central	14	87.5	2	100.0	1	100.0	66	88.0
Nelson Marlborough	4	100.0	1	50.0	2	100.0	62	93.9
Northland	23	74.2	1	100.0	1	100.0	30	85.7
Otago	4	100.0	2	100.0	3	100.0	100	96.2
South Canterbury	1	50.0	-	-	-	-	14	77.8
Southland	4	50.0	-	-	2	100.0	36	67.9
Tairawhiti	6	85.7	-	-	-	-	9	90.0
Taranaki	11	78.6	-	-	1	100.0	42	85.7
Waikato	44	78.6	1	100.0	6	85.7	127	86.4
Wairarapa	1	50.0	2	100.0	-	-	14	93.3
Waitemata	23	82.1	7	100.0	22	91.7	117	86.7
West Coast	1	100.0	-	-	-	-	10	83.3
Whanganui	5	62.5	0	0.0	-	-	14	82.4
Total	**279**	**79.3**	**71**	**81.6**	**106**	**85.5**	**1,256**	**86.6**

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

Table 20 - Women (ages 20-69 years) with a histology report within 90 days of a high grade cytology report, by DHB and age

	20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		Total
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Auckland	20	74.1	23	69.7	22	68.8	19	70.4	16	72.7	6	100.0	3	42.9	3	50.0	5	83.3	5	71.4	122
Bay of Plenty	14	73.7	17	81.0	19	82.6	11	73.3	5	71.4	9	100.0	4	66.7	8	72.7	3	75.0	1	50.0	91
Canterbury	60	83.3	33	75.0	34	77.3	26	76.5	19	82.6	7	70.0	9	60.0	4	57.1	4	80.0	1	20.0	197
Capital & Coast	12	80.0	13	72.2	16	94.1	10	83.3	7	100.0	3	75.0	3	50.0	0	0.0	0	0.0	-	-	64
Counties Manukau	33	73.3	12	70.6	14	82.4	20	76.9	19	90.5	18	85.7	4	44.4	3	50.0	6	75.0	3	75.0	132
Hawke's Bay	14	66.7	24	92.3	25	92.6	12	92.3	11	100.0	3	100.0	6	85.7	3	50.0	3	75.0	2	100.0	103
Hutt Valley	5	100.0	11	84.6	9	69.2	4	80.0	6	100.0	2	66.7	4	80.0	0	0.0	1	100.0	1	100.0	43
Lakes	6	85.7	11	73.3	7	87.5	6	75.0	4	80.0	5	100.0	4	80.0	3	100.0	1	50.0	-	-	47
Mid Central	25	89.3	14	66.7	19	100.0	9	90.0	3	60.0	2	66.7	1	50.0	1	100.0	4	100.0	1	100.0	79
Nelson Marlborough	12	75.0	17	100.0	7	87.5	8	100.0	10	83.3	6	75.0	2	66.7	-	-	1	50.0	-	-	63
Northland	9	69.2	9	81.8	11	100.0	5	62.5	4	66.7	5	83.3	3	75.0	4	100.0	2	100.0	1	33.3	53
Otago	28	93.3	23	95.8	14	87.5	14	87.5	7	100.0	8	88.9	4	80.0	2	100.0	1	50.0	1	50.0	102
South Canterbury	3	50.0	3	75.0	0	0.0	4	80.0	1	50.0	0	0.0	-	-	-	-	1	100.0	-	-	12
Southland	12	66.7	7	58.3	10	58.8	7	70.0	1	50.0	2	100.0	0	0.0	1	100.0	-	-	-	-	40
Tairawhiti	3	100.0	6	100.0	-	-	3	100.0	2	100.0	1	33.3	-	-	-	-	-	-	-	-	15
Taranaki	13	68.4	13	81.3	5	55.6	2	66.7	4	66.7	5	83.3	2	66.7	-	-	0	0.0	0	0.0	44
Waikato	30	76.9	35	85.4	24	72.7	23	85.2	17	85.0	12	70.6	9	81.8	6	66.7	8	72.7	2	66.7	166
Wairarapa	6	85.7	4	80.0	1	50.0	1	100.0	3	100.0	1	100.0	-	-	-	-	-	-	-	-	16
Waitemata	36	76.6	25	78.1	24	80.0	30	85.7	16	88.9	13	86.7	5	62.5	2	100.0	3	75.0	3	100.0	157
West Coast	3	75.0	3	75.0	1	100.0	1	100.0	0	0.0	1	100.0	-	-	0	0.0	-	-	-	-	9
Whanganui	8	66.7	4	66.7	1	50.0	3	100.0	1	100.0	1	50.0	1	100.0	-	-	-	-	-	-	19
Total	**352**	**77.7**	**307**	**79.5**	**263**	**79.7**	**218**	**80.7**	**156**	**83.4**	**110**	**81.5**	**64**	**65.3**	**40**	**64.5**	**43**	**74.1**	**21**	**61.8**	**1,574**

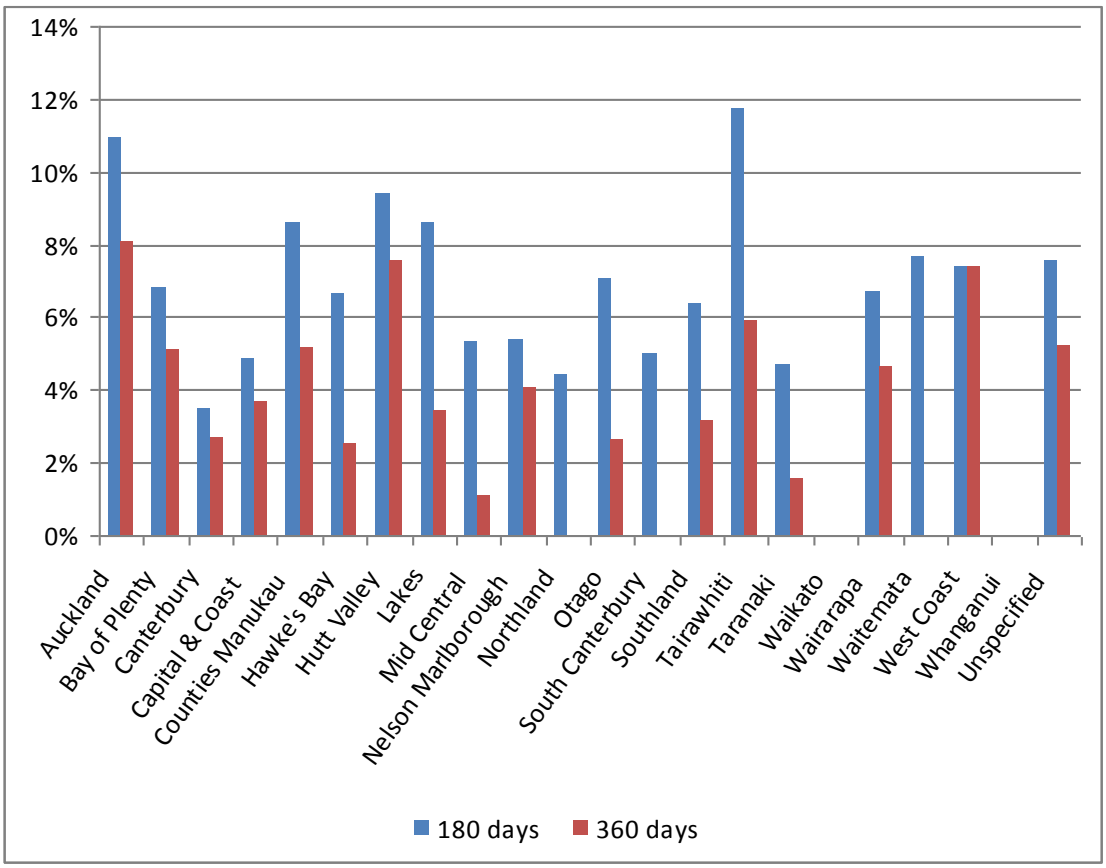
' – ' indicates there were no women in this sub-category with a high grade cytology report

Table 21 - Women (ages 20-69 years) with a histology report within 180 days of a high grade cytology report, by DHB and age

	20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		Total
DHB	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Auckland	22	81.5	26	78.8	25	78.1	22	81.5	18	81.8	6	100.0	4	57.1	3	50.0	5	83.3	6	85.7	137
Bay of Plenty	17	89.5	19	90.5	20	87.0	12	80.0	5	71.4	9	100.0	4	66.7	8	72.7	3	75.0	1	50.0	98
Canterbury	65	90.3	40	90.9	36	81.8	29	85.3	19	82.6	8	80.0	11	73.3	4	57.1	4	80.0	3	60.0	219
Capital & Coast	14	93.3	16	88.9	17	100.0	11	91.7	7	100.0	3	75.0	4	66.7	0	0.0	0	0.0	-	-	72
Counties Manukau	38	84.4	14	82.4	14	82.4	22	84.6	20	95.2	19	90.5	5	55.6	4	66.7	7	87.5	3	75.0	146
Hawke's Bay	16	76.2	25	96.2	26	96.3	13	100.0	11	100.0	3	100.0	6	85.7	3	50.0	3	75.0	2	100.0	108
Hutt Valley	5	100.0	11	84.6	12	92.3	4	80.0	6	100.0	3	100.0	4	80.0	0	0.0	1	100.0	1	100.0	47
Lakes	6	85.7	12	80.0	8	100.0	6	75.0	4	80.0	5	100.0	4	80.0	3	100.0	1	50.0	-	-	49
Mid Central	27	96.4	16	76.2	19	100.0	9	90.0	3	60.0	2	66.7	1	50.0	1	100.0	4	100.0	1	100.0	83
Nelson Marlborough	14	87.5	17	100.0	7	87.5	8	100.0	11	91.7	8	100.0	2	66.7	-	-	2	100.0	-	-	69
Northland	10	76.9	9	81.8	11	100.0	5	62.5	4	66.7	5	83.3	3	75.0	4	100.0	2	100.0	2	66.7	55
Otago	30	100.0	23	95.8	16	100.0	15	93.8	7	100.0	9	100.0	5	100.0	2	100.0	1	50.0	1	50.0	109
South Canterbury	5	83.3	3	75.0	1	100.0	4	80.0	1	50.0	0	0.0	-	-	-	-	1	100.0	-	-	15
Southland	13	72.2	7	58.3	11	64.7	7	70.0	1	50.0	2	100.0	0	0.0	1	100.0	-	-	-	-	42
Tairawhiti	3	100.0	6	100.0	-	-	3	100.0	2	100.0	1	33.3	-	-	-	-	-	-	-	-	15
Taranaki	15	78.9	16	100.0	7	77.8	3	100.0	5	83.3	6	100.0	2	66.7	-	-	0	0.0	0	0.0	54
Waikato	32	82.1	38	92.7	24	72.7	25	92.6	17	85.0	13	76.5	11	100.0	8	88.9	8	72.7	2	66.7	178
Wairarapa	6	85.7	4	80.0	2	100.0	1	100.0	3	100.0	1	100.0	-	-	-	-	-	-	-	-	17
Waitemata	39	83.0	28	87.5	27	90.0	32	91.4	17	94.4	13	86.7	5	62.5	2	100.0	3	75.0	3	100.0	169
West Coast	4	100.0	3	75.0	1	100.0	1	100.0	1	100.0	1	100.0	-	-	0	0.0	-	-	-	-	11
Whanganui	8	66.7	4	66.7	1	50.0	3	100.0	1	100.0	1	50.0	1	100.0	-	-	-	-	-	-	19
Total	**389**	**85.9**	**337**	**87.3**	**285**	**86.4**	**235**	**87.0**	**163**	**87.2**	**118**	**87.4**	**72**	**73.5**	**43**	**69.4**	**45**	**77.6**	**25**	**73.5**	**1,712**

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

Figure 32 – Proportion of women (ages 20-69 years) without any follow-up test within 180 days and 360 days of a high grade cytology report, by DHB



Indicator 7 – Colposcopy indicators

Definition	The calculation of these indicators is under development, and will include measures such as: 1. Waiting time for colposcopic assessment of abnormal cytology results. 2. Adequacy of recording at colposcopy. 3. Minimum colposcopy volumes. 4. Correlation between colposcopy and histology 5. Adequacy of treatment Some of these measures are still being defined.
Current Situation	Colposcopy data is being collected on the NCSP Register, but data relating to the time period of this report are believed to be incomplete, therefore measures were not calculated for the current reporting period. Data completeness is improving, and it is anticipated that these colposcopy indicators will be reported upon in future.

Indicator 8 – HPV tests

Definition

Triage of low grade cytology

For women with an LSIL or ASC-US (low grade) cytology result relating to a cervical sample taken in the monitoring period, and with no recent abnormal cytology (ie abnormal cytology results relating to specimens taken in the preceding five years), the following are reported on:

- The number and proportion of women with a subsequent HPV triage test (by age group and laboratory)
- Women with an invalid HPV test result, as a proportion of those with a subsequent HPV test (by age group and laboratory)
- Women with positive HPV triage result, as a proportion of women with a valid HPV test (by age group and laboratory).

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 (ie 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 (up until the most recent data held in the NCSP Register at the time of the data extraction for this analysis), 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 attending for cytology due to symptoms.

The following measures are also reported on:

- Invalid HPV tests, as a proportion of all HPV triage tests, by HPV test technology
- Number of days between the collection dates recorded for the cytology sample and the HPV test sample, by laboratory.

HPV test volumes

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

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

In some cases, the laboratory performing the cytology differs from that

	performing the HPV test. Measures reported by laboratory which show i) the proportion of women with a triage test, and ii) the proportion of those with a positive HPV test, are based on the laboratory which performed the cytology. Measures reporting on the proportion of HPV test results which are valid vs invalid, or the number of HPV tests processed, are based on the laboratory which performed the HPV test.
Target	This is a new measure, and targets have not yet been set.
Current Situation	***Triage of low grade cytology*** There were 1,304 women aged less than 30 years and 2,007 women aged 30 year 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 3,048 women aged less than 30 years and 1,833 women aged 30 years or more. Among these women, 60.5% of women aged 30 years or more with an ASC-US cytology result, and 61.6% of women aged 30 years or more with an LSIL cytology result are recorded as having a subsequent HPV triage test (Table 56). These proportions ranged from 13.5% (LabPLUS) to 97.6% (Aotea Pathology Ltd) for ASC-US cytology results and from 8.3% (LabPLUS) to 95.1% (Aotea Pathology Ltd) for LSIL cytology results (Figure 33, Table 56, Table 57). 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 HPV triage are substantially lower. Subsequent HPV triage tests are recorded in the NCSP Register for 0.6% of women aged less than 30 years with ASC-US results, and 1.3% of women aged less than 30 years with LSIL results. These proportions ranged from 0% (Diagnostic Medlab Ltd, LabPLUS, Medlab Central, Medlab South Christchurch, Southern Community Labs – Dunedin) to 3.0% (Canterbury Health Laboratories) for women with ASC-US results, and from 0% (LabPLUS) to 2.6% (Canterbury Health Laboratories) for women with LSIL results (Figure 34, Table 56, Table 57). The proportion of women aged 30 years or more whose HPV test results were invalid was very small (Figure 35, Table 58, Table 59). It was less than 5% in all laboratories other than LabPLUS, where the proportion for LSIL was 20%, however this reflected tests in just five women (Table 59). The proportion was also very small for all HPV test technologies, ranging from 0% (Abbott RealTime) to 1.2% (Amplicor PCR) (Figure 39, Table 60). No HPV triage tests relating to the current monitoring period were performed using Digene HC2 or Roche Linear Array (Table 60). Among women aged 30 years or more with valid HPV triage test results, the proportion who were positive for high risk HPV was 25% for women with ASC-US results, and 59% for women with LSIL results. These proportions varied by laboratory from 10% (Canterbury Health Laboratories) to 44% (Aotea Pathology) for women with ASC-US cytology (Figure 36), and from 49% (Diagnostic Medlab)

to 70% (Medlab Central) for women with LSIL cytology (Figure 37).

The proportion of women whose HPV triage test was positive also varied by age. HPV positivity generally decreased with increasing age (Figure 38, Table 22, Table 23). HPV positivity among women aged 60 years or more with LSIL cytology appears higher than in some younger women, however these results are based on small numbers of women (Table 23).

Virtually all HPV triage tests were performed on specimens collected at the same time as the cytology specimen (ie reflex testing from LBC samples). Overall 97.8% of HPV triage tests were performed on cervical specimens collected at the same time as cytology specimens (ranging from 83.3% at LabPLUS to 99.5% at Canterbury Health Laboratories) (Table 24). LabPLUS was the only laboratory where less than 90% of HPV tests appeared to be on the same sample as cytology (among the remaining labs it ranged from 94.1% to 99.5%). At LabPLUS, all HPV tests recorded were performed on cervical samples collected within four weeks of the cytology sample.

HPV test volumes

There were 11,278 samples received by laboratories for HPV testing within the current reporting period. These are reported on further in Table 25 to Table 27.

Virtually all (99.3%) samples for HPV testing were from women aged 20-69 years. The large majority of women (89.0%) were aged 30 years or more (Table 25).

The majority of HPV test samples (84.8%) related to European/Other women, and the number was smallest among Pacific women (200, or 1.8% of all HPV samples received) (Table 26).

The number of samples received by laboratories for HPV testing ranged from 48 (Southern Community Labs Dunedin; 0.4% of all HPV tests nationally) to 3,792 (Southern Community Labs Christchurch; 33.6% of all HPV tests) (Table 27).

Trends

This is a new measure, first reported on in the current monitoring report, therefore trend analysis was not possible.

Comments

This is the first report in which results from HPV tests have been reported, and this indicator is under development.

For the analyses of HPV triage, we attempted to restrict this analysis to women whose current cytology result and screening history suggest that HPV triage would be the recommended management (for women aged 30 years or more), however this may not have been the case for all women. Exploratory analysis indicated that all of the 1,495 women aged 30 years or more with a low grade cytology result who had no record of a subsequent HPV triage test, all had a recommendation code indicating follow-up should occur within 12 months. Among these women, 2% were recommended to come back after a course of oestrogen or soon after pregnancy; 3% were recommended to return in 6

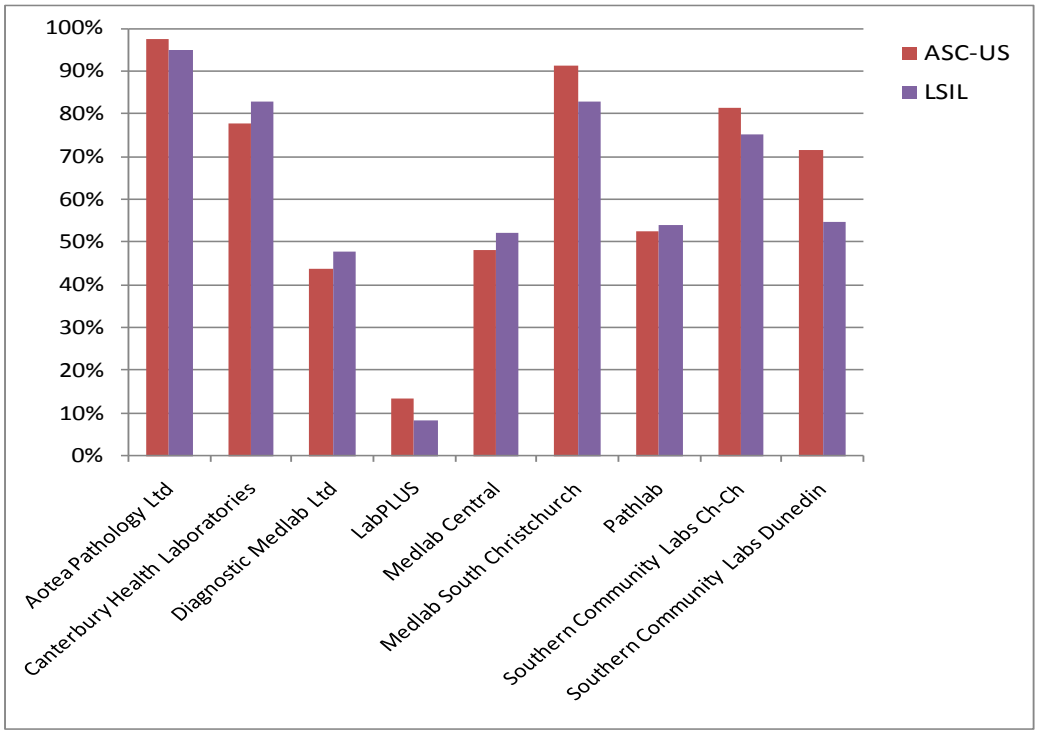
months; 62% were recommended to return in 12 months, and 33% had a recommendation to refer to a specialist.

HPV triage is not included in the NCSP 2008 Guidelines for women aged less than 30 years old. We explored age further among the 48 women aged less than 30 years with a record of a subsequent HPV triage test to determine if many of these women may have been aged 29 at the time of their cytology sample. The 48 women with a subsequent HPV test ranged in age from 17 years to 29 years at the time of their cytology sample, and their median age was 25.5 years. Seven women were aged 29 years at the time of their cytology sample. It is possible that some of these women may have turned 30 by the time of their cytology result, and that this was the reason HPV triage was performed, however this is difficult to ascertain with accuracy from the NCSP Register data.

It is not possible to determine directly from the NCSP Register whether the same cervical LBC sample was used to perform both the cytology test and the HPV test. To estimate the extent to which this occurs, the collection dates recorded for the samples used for each test were compared. It is assumed that samples used for a cytology test and an HPV test which were collected on the same date indicate that the same LBC sample was used for both tests.

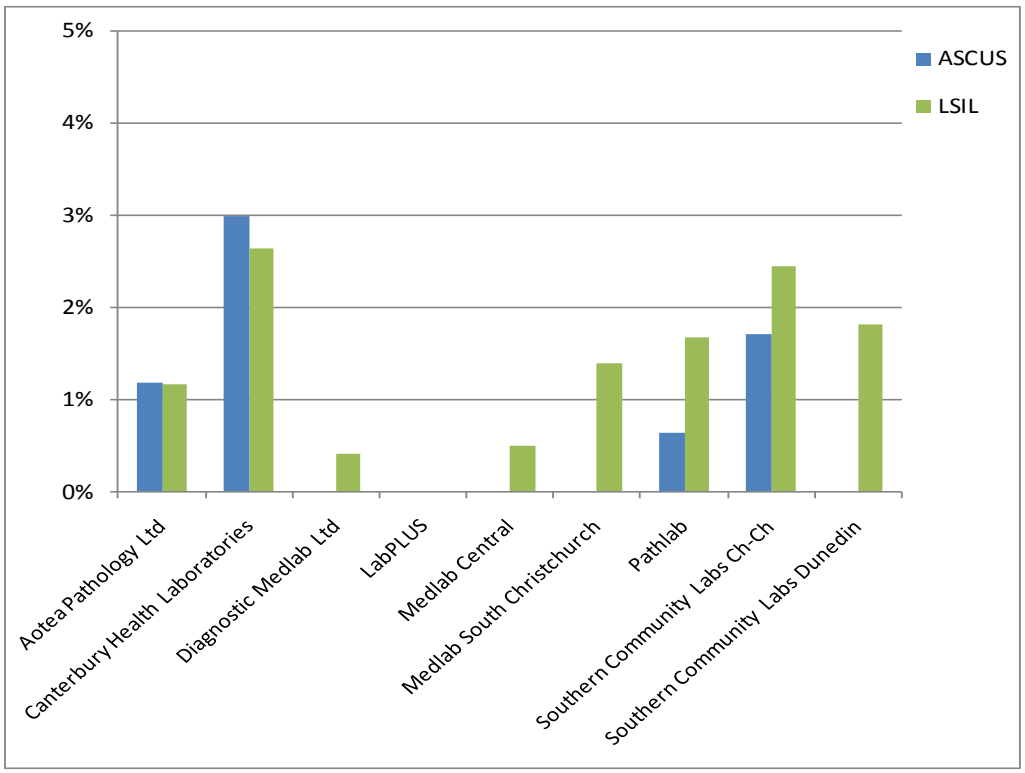
The NCSP Register does not contain codes for all HPV test technologies used. In particular, there is no code for cobas® 4800 (Roche); these tests appear to be coded as either Roche Amplicor or Other.

Figure 33 – Proportion of women (aged 30 years or more) with low grade cytology who have a subsequent HPV triage test, by laboratory* and cytology result



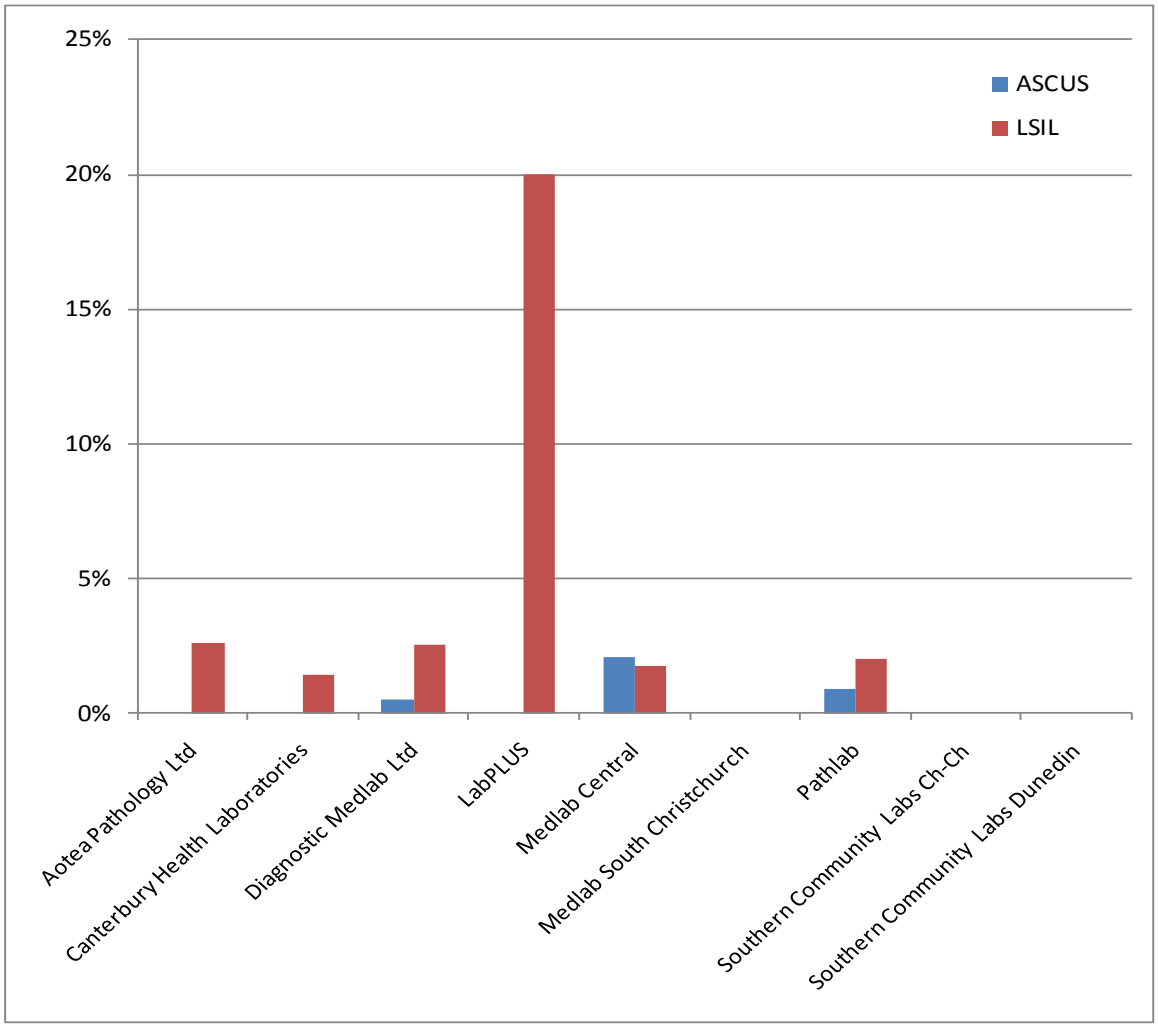
** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the cytology test*
Excludes women with abnormal cytology in the five years preceding this low grade cytology

Figure 34 – Proportion of women (aged less than 30 years) with low grade cytology who have a subsequent HPV triage test, by laboratory* and cytology result



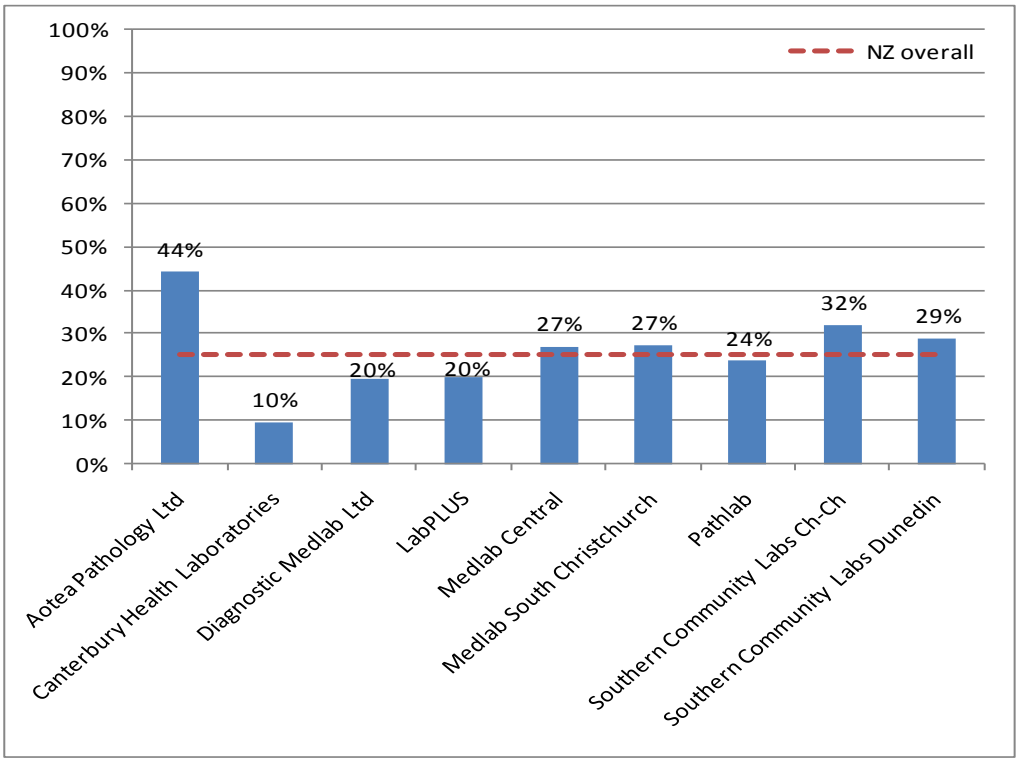
** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the cytology test*
Excludes women with abnormal cytology in the five years preceding this low grade cytology

Figure 35 - Proportion of women (aged 30 years or more) with low grade cytology whose subsequent HPV triage test result is invalid, by laboratory* and cytology result



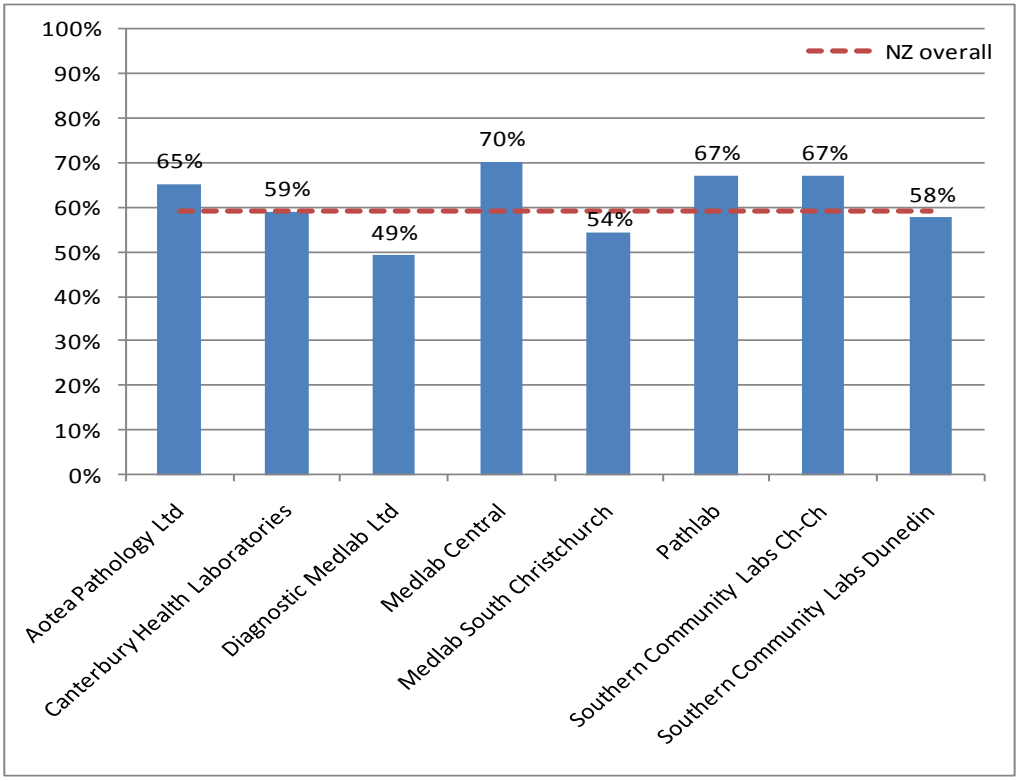
** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the HPV test*

Figure 36 - Proportion of HPV triage tests which are positive following ASC-US cytology (women aged 30 years or more) , by laboratory*



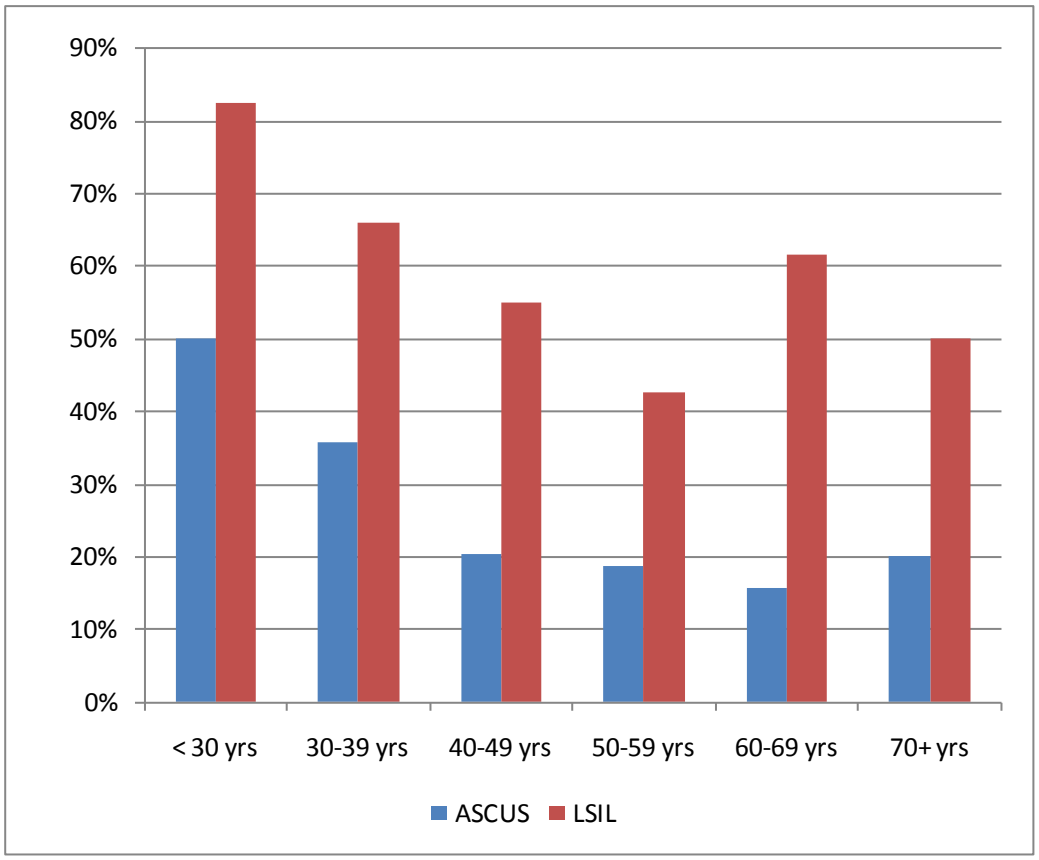
** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the cytology test*

Figure 37 - Proportion of HPV triage tests which are positive following LSIL cytology (women aged 30 years or more) , by laboratory*



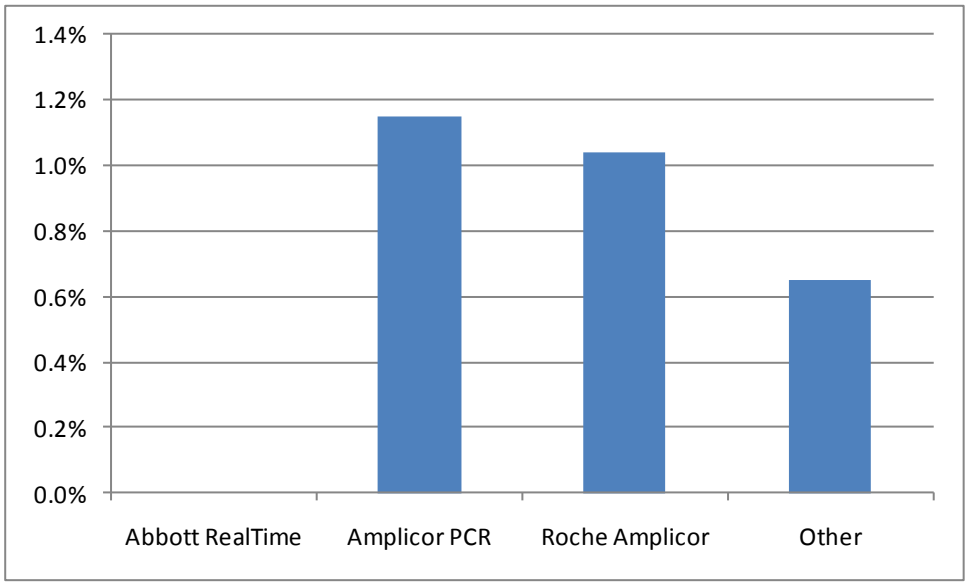
** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the cytology test*

Figure 38 – Proportion of women with an HPV triage test who are HPV positive, by age and cytology result



Note: Results for women aged less than 30 years are based on very small numbers of women, as HPV triage testing is generally not performed in these women. Only eight women aged less than 30 years have valid HPV test results.

Figure 39 - Proportion of HPV triage tests where the result was invalid, by HPV test type



No triage tests of the following HPV test type were recorded: Digene HC2, Roche Linear Array

Table 22 - 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 who are positive)											
	< 30yrs	30+ yrs	< 30yrs		30-39 yrs		40-49 yrs		50-59 yrs		60-69 yrs		aged 70+ yrs	
	N	N	N	%	N	%	N	%	N	%	N	%	N	%
Aotea Pathology Ltd	2	120	1	50.0	37	59.7	12	36.4	2	13.3	2	20.0	0	0.0
Canterbury Health Laboratories	2	125	0	0.0	5	15.6	3	6.3	2	5.9	2	18.2	0	0.0
Diagnostic Medlab Ltd	0	380	0	0.0	37	27.4	28	20.6	8	10.3	2	6.7	0	0.0
LabPLUS	0	5	0	0.0	0	0.0	1	50.0	0	0.0	0	0.0	0	0.0
Medlab Central	0	48	0	0.0	5	29.4	3	18.8	5	45.5	0	0.0	0	0.0
Medlab South Christchurch	0	204	0	0.0	26	40.0	18	20.2	10	30.3	2	13.3	0	0.0
Pathlab	1	110	0	0.0	8	20.0	12	28.6	3	16.7	2	25.0	1	50.0
Southern Community Labs Ch-Ch	3	181	3	100.0	33	53.2	9	14.5	12	28.6	3	30.0	1	20.0
Southern Community Labs Dunedin	0	38	0	0.0	3	18.8	4	30.8	3	37.5	1	100.0	0	0.0
Total	**8**	**1,211**	**4**	**50.0**	**154**	**35.6**	**90**	**20.4**	**45**	**18.8**	**14**	**15.7**	**2**	**20.0**

Excludes women with abnormal cytology in the five years preceding this low grade cytology

Table 23 - 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 who are positive)											
	< 30yrs	30+ yrs	< 30yrs		30-39 yrs		40-49 yrs		50-59 yrs		60-69 yrs		aged 70+ yrs	
	N	N	N	%	N	%	N	%	N	%	N	%	N	%
Aotea Pathology Ltd	4	150	3	75.0	63	74.1	19	43.2	10	71.4	5	83.3	1	100.0
Canterbury Health Laboratories	4	66	4	100.0	14	50.0	18	72.0	5	45.5	2	100.0	0	0.0
Diagnostic Medlab Ltd	4	344	3	75.0	92	56.1	46	42.6	17	33.3	14	70.0	0	0.0
LabPLUS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Medlab Central	1	57	0	0.0	20	74.1	15	62.5	2	100.0	3	75.0	0	0.0
Medlab South Christchurch	3	103	1	33.3	32	56.1	19	61.3	4	36.4	1	25.0	0	0.0
Pathlab	6	100	5	83.3	40	72.7	20	71.4	6	42.9	1	33.3	0	0.0
Southern Community Labs Ch-Ch	15	240	14	93.3	98	77.2	41	62.1	17	45.9	5	50.0	0	0.0
Southern Community Labs Dunedin	3	52	3	100.0	20	62.5	8	66.7	1	20.0	1	33.3	0	0.0
Total	**40**	**1,112**	**33**	**82.5**	**379**	**65.9**	**186**	**55.0**	**62**	**42.8**	**32**	**61.5**	**1**	**50.0**

Excludes women with abnormal cytology in the five years preceding this low grade cytology

Table 24 – Time elapsed between the collection dates of cytology sample and the HPV sample, by laboratory

	Time between cytology sample and subsequent HPV test sample									
Laboratory	**Same day (reflex test)**		**1 day - 4 weeks**		**>4 – 12 weeks**		**>12 – 26 weeks**		**>26 weeks**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Aotea Pathology Ltd	276	98.6	1	0.4	0	0.0	3	1.1	0	0.0
Canterbury Health Laboratories	197	99.5	0	0.0	0	0.0	1	0.5	0	0.0
Diagnostic Medlab Ltd	731	98.9	1	0.1	3	0.4	3	0.4	1	0.1
LabPLUS	5	83.3	1	16.7	0	0.0	0	0.0	0	0.0
Medlab Central	103	95.4	1	0.9	1	0.9	3	2.8	0	0.0
Medlab South Christchurch	306	98.7	1	0.3	1	0.3	2	0.6	0	0.0
Pathlab	207	94.1	4	1.8	6	2.7	2	0.9	1	0.5
Southern Community Labs Ch-Ch	427	97.3	0	0.0	5	1.1	6	1.4	1	0.2
Southern Community Labs Dunedin	89	95.7	0	0.0	2	2.2	2	2.2	0	0.0
Total	**2,341**	**97.8**	**9**	**0.4**	**18**	**0.8**	**22**	**0.9**	**3**	**0.1**

Table 25 – Volume of HPV test samples received by laboratories during the monitoring period, by age

	HPV tests received*	
Age	**N**	**% of national total**
<20	20	0.2
20-24	454	4.0
25-29	766	6.8
30-34	1,751	15.5
35-39	2,013	17.8
40-44	1,853	16.4
45-49	1,650	14.6
50-54	1,162	10.3
55-59	773	6.9
60-64	506	4.5
65-69	273	2.4
70+	57	0.5
Total	**11,278**	**100.0**

** HPV tests received which were performed for any purpose*

Table 26 - Volume of HPV test samples received by laboratories during the monitoring period, by ethnicity

	HPV tests received*	
Ethnicity	**N**	**% of national total**
Māori	1,037	9.2
Pacific	200	1.8
Asian	478	4.2
European/Other	9,563	84.8
Total	**11,278**	**100.0**

** HPV tests received which were performed for any purpose*

Table 27 – Volume of HPV test samples received during the monitoring period, by laboratory

	HPV tests received*	
Laboratory	**N**	**% of national total**
Aotea Pathology Ltd	979	8.7
Canterbury Health Laboratories	1,234	10.9
Diagnostic Medlab Ltd	1,242	11.0
LabPLUS	178	1.6
Medlab Central	1,161	10.3
Medlab South Christchurch	1,909	16.9
Pathlab	735	6.5
Southern Community Labs Ch-Ch	3,792	33.6
Southern Community Labs Dunedin	48	0.4
Total	**11,278**	**100.0**

** HPV tests received which were performed for any purpose*

Appendix A – Additional data

Indicator 1 - Coverage

Table 28 - Coverage by age (women 20-69 years screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)

Age (years)	Hysterectomy-adjusted population	Women screened in the last 3 years	
		N	%
20-24	**153,298**	**84,005**	**54.8**
25-29	**145,704**	**97,189**	**66.7**
30-34	**139,816**	**101,872**	**72.9**
35-39	**155,695**	**119,910**	**77.0**
40-44	**153,854**	**121,068**	**78.7**
45-49	**148,836**	**119,948**	**80.6**
50-54	**123,822**	**99,408**	**80.3**
55-59	**100,339**	**78,343**	**78.1**
60-64	**89,180**	**64,588**	**72.4**
65-69	**69,686**	**43,994**	**63.1**
TOTAL	**1,280,230**	**930,328**	**72.7**

Target: 75%; Coverage calculated using population projection for mid-2010 based on 2006 Census data

Table 29 - Coverage by DHB (women 25-69 years screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)

DHB	Hysterectomy-adjusted population	Women screened in the last 3 years	
		N	%
Auckland	128,498	93,073	72.4
Bay of Plenty	52,829	40,958	77.5
Canterbury	129,928	98,806	76.0
Capital & Coast	79,751	63,122	79.1
Counties Manukau	124,717	85,456	68.5
Hawke's Bay	38,722	30,075	77.7
Hutt Valley	37,042	28,405	76.7
Lakes	26,110	19,854	76.0
Mid Central	41,047	30,414	74.0
Nelson Marlborough	35,733	28,193	78.9
Northland	39,236	29,066	74.1
Otago	46,509	36,866	79.3
South Canterbury	13,751	10,725	78.0
Southland	28,909	21,798	75.4
Tairawhiti	11,521	8,560	74.3
Taranaki	26,992	22,471	83.3
Waikato	90,225	67,362	74.7
Wairarapa	9,939	7,896	79.4
Waitemata	141,814	105,792	74.6
West Coast	8,349	5,783	69.3
Whanganui	15,309	11,307	73.9
Total	**1,126,932**	**845,982**	**75.1**

Target: 75%; Coverage calculated using population projection for mid-2010 based on 2006 Census data

Table 30 - Coverage by ethnicity (women 25-69 years screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)

Ethnicity	Hysterectomy adjusted population	Women screened in the last 3 years (ages 25-69 years)	
	(ages 25-69 years)	N	%
Māori	146,633	81,921	55.9
Pacific	65,128	39,396	60.5
Asian	138,141	75,441	54.6
European/Other	777,030	649,565	83.6
Total	**1,126,932**	**846,323**	**75.1**

Target: 75%; Coverage calculated using population projection for mid-2010 based on 2006 Census data

Table 31 - Coverage by ethnicity (women 25-69 years screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population) – counts weighted using ethnicity adjustors to correct for undercounting in NCSP Register

Ethnicity	Hysterectomy adjusted population	Women screened in the last 3 years (ages 25-69 years; adjusted for ethnicity misclassification)	
	(ages 25-69 years)	N	%
Māori	146,633	97,631	66.6
Pacific	65,128	44,069	67.7
Asian	138,141	99,326	71.9
European/Other	770,030	601,118	77.4

Table 32 - Coverage by ethnicity (women 20-69 years screened in the three years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population) – counts weighted using ethnicity adjustors to correct for undercounting in NCSP Register

Ethnicity	Hysterectomy adjusted population	Women screened in the last 3 years (ages 20-69 years; adjusted for ethnicity misclassification)	
	(ages 20-69 years)	N	%
Māori	176,003	115,189	65.4
Pacific	77,558	49,854	64.3
Asian	162,499	104,848	64.5
European/ Other	864,170	652,813	75.5

Table 33 - Coverage by age (women 20-69 years screened in the five years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)

Age (years)	Hysterectomy-adjusted population	Number of women screened in last 5 years	% screened in the last 5 years
20-24	153,298	90,961	59.3
25-29	145,704	117,615	80.7
30-34	139,816	120,839	86.4
35-39	155,695	139,919	89.9
40-44	153,854	140,280	91.2
45-49	148,836	138,265	92.9
50-54	123,822	114,812	92.7
55-59	100,339	89,683	89.4
60-64	89,180	73,651	82.6
65-69	69,686	51,040	73.2
TOTAL	**1,280,230**	**1,077,065**	**84.1**

Table 34 - Coverage by DHB (women aged 25-69 years screened in the five years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population)

DHB	Hysterectomy adjusted population	Women screened in the last 5 years	
		N	%
Auckland	128,498	110,362	85.9
Bay of Plenty	52,829	47,390	89.7
Canterbury	129,928	114,996	88.5
Capital & Coast	79,751	73,368	92.0
Counties Manukau	124,717	100,466	80.6
Hawke's Bay	38,722	34,666	89.5
Hutt Valley	37,042	33,365	90.1
Lakes	26,110	23,160	88.7
Mid Central	41,047	35,139	85.6
Nelson Marlborough	35,733	32,713	91.5
Northland	39,236	33,961	86.6
Otago	46,509	42,394	91.2
South Canterbury	13,751	12,238	89.0
Southland	28,909	25,459	88.1
Tairawhiti	11,521	10,089	87.6
Taranaki	26,992	25,744	95.4
Waikato	90,225	78,766	87.3
Wairarapa	9,939	8,924	89.8
Waitemata	141,814	122,443	86.3
West Coast	8,349	6,791	81.3
Whanganui	15,309	12,202	86.2
Total	**1,126,932**	**985,636**	**87.5**

Table 35 - Coverage by ethnicity – women aged 25-69 years screened in the five years prior to 30 June 2010, as a proportion of hysterectomy-adjusted female population

Ethnicity	Hysterectomy adjusted population	Women screened in the last 5 years	
		N	%
Māori	146,633	99,017	67.5
Pacific	65,128	47,091	72.3
Asian	138,141	87,574	63.4
European/Other	777,030	752,422	96.8
TOTAL	**1,126,932**	**986,104**	**87.5**

Table 36 - Women screened under 20 years of age, and aged 15-19 years, in the three years prior to 30 June 2010, by DHB.

DHB	Number of women screened in last 3 years		% of population aged 15-19 years screened
	aged < 20 years	aged 15-19 years	
Auckland	1,804	1,796	11.7
Bay of Plenty	621	619	8.6
Canterbury	2,863	2,847	15.9
Capital & Coast	949	945	9.5
Counties Manukau	2,390	2,371	12.0
Hawke's Bay	677	674	12.4
Hutt Valley	516	512	9.7
Lakes	326	326	9.0
Mid Central	464	462	7.0
Nelson Marlborough	438	438	10.5
Northland	457	451	8.5
Otago	895	890	11.0
South Canterbury	289	283	15.9
Southland	427	427	12.7
Tairawhiti	204	202	11.8
Taranaki	386	385	10.3
Waikato	1,033	1,029	7.5
Wairarapa	162	161	12.5
Waitemata	2,501	2,489	12.5
West Coast	113	113	10.7
Whanganui	156	155	6.9
Total	**17,671**	**17,575**	**11.2**

Table 37 – Women screened under 20 years of age, as a proportion of all women screened in the three years to 30 June 2010, by DHB

DHB	Number of women screened in last 3 years		Proportion of women screened who were aged < 20 years (%)
	aged < 20 years	all ages	
Auckland	1,804	103,905	1.7
Bay of Plenty	621	46,153	1.3
Canterbury	2,863	112,854	2.5
Capital & Coast	949	71,895	1.3
Counties Manukau	2,390	96,564	2.5
Hawke's Bay	677	33,896	2.0
Hutt Valley	516	31,833	1.6
Lakes	326	22,191	1.5
Mid Central	464	35,064	1.3
Nelson Marlborough	438	31,156	1.4
Northland	457	32,501	1.4
Otago	895	43,225	2.1
South Canterbury	289	12,041	2.4
Southland	427	24,595	1.7
Tairawhiti	204	9,731	2.1
Taranaki	386	25,312	1.5
Waikato	1,033	76,706	1.3
Wairarapa	162	8,823	1.8
Waitemata	2,501	118,325	2.1
West Coast	113	6,436	1.8
Whanganui	156	12,771	1.2
Total	**17,671**	**955,977**	**1.8**

Table 38 – Proportion of women screened under 20 years of age in the three years to 30 June 2010 who were aged 18-19 years, by DHB

DHB	Number of women screened in last 3 years		
	aged 10-19 years	aged 18-19 years	
	N	N	%
Auckland	1,804	1,411	78.2
Bay of Plenty	621	484	77.9
Canterbury	2,863	2,233	78.0
Capital & Coast	949	820	86.4
Counties Manukau	2,390	1,735	72.6
Hawke's Bay	677	517	76.4
Hutt Valley	516	412	79.8
Lakes	326	250	76.7
Mid Central	464	413	89.0
Nelson Marlborough	438	349	79.7
Northland	457	353	77.2
Otago	895	701	78.3
South Canterbury	289	199	68.9
Southland	427	344	80.6
Tairawhiti	204	143	70.1
Taranaki	386	308	79.8
Waikato	1,033	886	85.8
Wairarapa	162	110	67.9
Waitemata	2,501	1,828	73.1
West Coast	113	88	77.9
Whanganui	156	114	73.1
Total	***17,671***	***13,698***	***77.5***

Table 39 - Women aged 25-69 years screened in the three years to 31 December 2010, as a proportion of i) the hysterectomy-adjusted NZ female population and ii) the total NZ female population, by DHB

DHB	Women screened in the last 3 years (hysterectomy-adjusted population)	Women screened in the last 3 years (no hysterectomy adjustment to population)
Auckland	72.4	66.4
Bay of Plenty	77.5	68.8
Canterbury	76.0	67.0
Capital & Coast	79.1	71.7
Counties Manukau	68.5	62.9
Hawke's Bay	77.7	68.6
Hutt Valley	76.7	68.8
Lakes	76.0	67.9
Mid Central	74.1	65.4
Nelson Marlborough	78.9	68.8
Northland	74.1	65.1
Otago	79.3	69.5
South Canterbury	78.0	67.5
Southland	75.4	66.9
Tairawhiti	74.3	67.0
Taranaki	83.3	73.0
Waikato	74.7	66.1
Wairarapa	79.4	69.3
Waitemata	74.6	67.2
West Coast	69.3	60.4
Whanganui	73.9	64.7

Indicator 2 – First screening events

Table 40 - Age distribution of first screening events for the period 1 January to 30 June 2010

Age	Women with first events	% of first events (ages 20-69 yrs) which occurred in that age group
20-24	9,949	45.1
25-29	3,462	15.7
30-34	2,379	10.8
35-39	1,688	7.7
40-44	1,360	6.2
45-49	1,063	4.8
50-54	755	3.4
55-59	586	2.7
60-64	470	2.1
65-69	331	1.5
20-69 yrs	**22,043**	

Note: Percentage = number of first screens in that age group divided by total number of first screens multiplied by 100

Table 41 - Women (ages 20-69 years) with a first screening event during the period 1 January to 30 June 2010, by ethnicity: counts weighted using ethnicity adjustors to correct for undercounting in NCSP Register.

Ethnicity	Women with first events (adjusted)	As a proportion of women with a screening event[i]		As a proportion of eligible population[ii]	
		N	%	N	%
Māori	3,069	26,596	11.5	163,913	1.9
Pacific	2,082	10,974	19.0	68,598	3.0
Asian	6,321	25,589	24.7	129,626	4.9
European/Other	12,319	148,684	8.3	828,716	1.5

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 2006 Census population projected to mid-2010 for that DHB, as a percent

Indicator 3 – Withdrawals

Table 42 - Withdrawal rates by DHB for the period 1 January to 30 June 2010

DHB	Enrolled at start	Women withdrawn	
		N	%
Auckland	163,762	8	0.005
Bay of Plenty	64,792	3	0.005
Canterbury	157,479	7	0.004
Capital & Coast	102,707	-	0.000
Counties Manukau	140,051	2	0.001
Hawke's Bay	47,222	2	0.004
Hutt Valley	47,633	-	0.000
Lakes	32,755	-	0.000
Mid Central	49,361	1	0.002
Nelson Marlborough	42,368	6	0.014
Northland	46,001	3	0.007
Otago	49,005	3	0.005
South Canterbury	15,997	1	0.006
Southland	34,956	-	0.000
Tairawhiti	13,971	1	0.007
Taranaki	33,607	1	0.003
Waikato	108,162	3	0.003
Wairarapa	11,475	-	0.000
Waitemata	163,960	5	0.003
West Coast	9,193	1	0.011
Whanganui	18,556	-	0.000
Unspecified	*1,835*	-	*0.000*
Total	**1,364,848**	**47**	**0.003**

Indicator 4 – Early re-screening

Table 43 - Early re-screening by five-year age group, 1 January to 30 June 2010 (cohort method)

Age	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
20-24	1,113	358	32.2
25-29	3,372	970	28.8
30-34	3,703	1,048	28.3
35-39	4,962	1,357	27.3
40-44	5,383	1,513	28.1
45-49	5,520	1,518	27.5
50-54	4,865	1,299	26.7
55-59	3,862	976	25.3
60-64	3,250	756	23.3
65-69	2,166	401	18.5
TOTAL	**38,196**	**10,196**	**26.7**

Table 44 - Early re-screening by DHB, 1 January to 30 June 2010 (cohort method)

DHB	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
Auckland	4,189	1,445	34.5
Bay of Plenty	1,916	581	30.3
Canterbury	4,428	1,217	27.5
Capital & Coast	3,012	816	27.1
Counties Manukau	3,445	945	27.4
Hawke's Bay	1,467	323	22.0
Hutt Valley	1,305	247	18.9
Lakes	934	330	35.3
Mid Central	1,247	212	17.0
Nelson Marlborough	1,296	255	19.7
Northland	1,300	349	26.8
Otago	1,701	269	15.8
South Canterbury	554	123	22.2
Southland	923	164	17.8
Tairawhiti	332	74	22.3
Taranaki	982	128	13.0
Waikato	3,075	528	17.2
Wairarapa	369	123	33.3
Waitemata	4,881	1,884	38.6
West Coast	290	69	23.8
Whanganui	521	108	20.7
Unspecified	*29*	*6*	*20.7*
Total	**38,196**	**10,196**	**26.7**

Table 45 - Early re-screening by ethnicity, 1 January to 30 June 2010 (cohort method)

Ethnicity	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
Māori	3,354	831	24.8
Pacific	1,379	318	23.1
Asian	3,035	986	32.5
European/Other	30,428	8,061	26.5
Total	**38,196**	**10,196**	**26.7**

Indicator 5 – Laboratory indicators

Indicator 5.2 – Accuracy of cytology predicting HSIL

Table 46 - Positive predictive value of a report of HSIL+SC cytology by laboratory, 1 January to 30 June 2010

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Aotea Pathology Ltd	77	89.5	62	80.5	9	10.5	86
Canterbury Health Laboratories	80	92.0	72	90.0	7	8.0	87
Diagnostic Medlab Ltd	218	89.7	176	80.7	25	10.3	243
LabPLUS	163	90.6	148	90.8	17	9.4	180
Medlab Central	133	91.7	114	85.7	12	8.3	145
Medlab South Christchurch	87	92.6	70	80.5	7	7.4	94
Pathlab	126	90.0	97	77.0	14	10.0	140
Southern Community Labs Ch-Ch	40	93.0	36	90.0	3	7.0	43
Southern Community Labs Dunedin	370	90.7	305	82.4	38	9.3	408
Total	**1,294**	**90.7**	**1,080**	**83.5**	**132**	**9.3**	**1,426**

Target: 65% - 85%

Table 47 - Positive predictive value of a report of ASC-H cytology by laboratory, 1 January to 30 June 2010

Laboratory	Histology available		ASC-H confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Aotea Pathology Ltd	68	82.9	33	48.5	14	17.1	82
Canterbury Health Laboratories	91	83.5	63	69.2	18	16.5	109
Diagnostic Medlab Ltd	167	80.3	77	46.1	41	19.7	208
LabPLUS	153	79.3	74	48.4	40	20.7	193
Medlab Central	81	73.0	51	63.0	30	27.0	111
Medlab South Christchurch	95	81.2	46	48.4	22	18.8	117
Pathlab	67	71.3	32	47.8	27	28.7	94
Southern Community Labs Ch-Ch	31	75.6	18	58.1	10	24.4	41
Southern Community Labs Dunedin	63	70.0	29	46.0	27	30.0	90
Total	**816**	**78.1**	**423**	**51.8**	**229**	**21.9**	**1,045**

Table 48 - Positive predictive value of a report of ASC-H + HSIL + SC cytology by laboratory, 1 January to 30 June 2010

Laboratory	Histology available		Abnormality confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Aotea Pathology Ltd	145	86.3	95	65.5	23	13.7	168
Canterbury Health Laboratories	171	87.2	135	78.9	25	12.8	196
Diagnostic Medlab Ltd	385	85.4	253	65.7	66	14.6	451
LabPLUS	316	84.7	222	70.3	57	15.3	373
Medlab Central	214	83.6	165	77.1	42	16.4	256
Medlab South Christchurch	182	86.3	116	63.7	29	13.7	211
Pathlab	193	82.5	129	66.8	41	17.5	234
Southern Community Labs Ch-Ch	71	84.5	54	76.1	13	15.5	84
Southern Community Labs Dunedin	433	86.9	334	77.1	65	13.1	498
Total	**2,110**	**85.4**	**1,503**	**71.2**	**361**	**14.6**	**2,471**

Indicator 5.5 – Laboratory turnaround time

Table 49 - Timeliness of cytology reporting by laboratory, 1 January to 30 June 2010

	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**
Aotea Pathology Ltd	3,539	16.1	17,976	81.9	21,515	98.0	439	2.0	21,954
Canterbury Health Laboratories	9,142	76.7	2,460	20.6	11,602	97.4	314	2.6	11,916
Diagnostic Medlab Ltd	62,026	99.1	395	0.6	62,421	99.8	150	0.2	62,571
LabPLUS	3,666	79.6	762	16.6	4,428	96.2	175	3.8	4,603
Medlab Central	16,569	91.2	1,575	8.7	18,144	99.9	23	0.1	18,167
Medlab South Christchurch	16,658	100.0	-	0.0	16,658	100.0	-	0.0	16,658
Pathlab	17,625	87.4	1,987	9.9	19,612	97.2	557	2.8	20,169
Southern Community Labs Ch-Ch	43,457	85.6	7,145	14.1	50,602	99.6	188	0.4	50,790
Southern Community Labs Dunedin	13,051	98.1	228	1.7	13,279	99.8	26	0.2	13,305
Total	**185,733**	**84.4**	**32,528**	**14.8**	**218,261**	**99.1**	**1,872**	**0.9**	**220,133**

Target: 90 % within seven working days and 100% within 15 working days.

** 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 reporting period. Indicator 5.1 shows the total number of cytology samples* taken *during the period.*

Table 50 - Timeliness of histology reporting by laboratory, 1 January to 30 June 2010

Laboratory	Laboratory turnaround time - histology								
	Within 5 days		6-15 days		Total within 15 days		More than 15 days		Total*
	N	%	N	%	N	%	N	%	N
Aotea Pathology Ltd	266	78.5	71	20.9	337	99.4	2	0.6	**339**
Canterbury Health Laboratories	1,159	86.4	177	13.2	1,336	99.6	6	0.4	**1,342**
Diagnostic Medlab Limited	1,399	83.3	263	15.7	1,662	99.0	17	1.0	**1,679**
Hutt Hospital Laboratory	173	63.1	100	36.5	273	99.6	1	0.4	**274**
LabPLUS	346	48.8	330	46.5	676	95.3	33	4.7	**709**
Medlab Central	758	81.9	44	4.8	802	86.6	124	13.4	**926**
Medlab South Christchurch	105	100.0	-	0.0	105	100.0	-	0.0	**105**
Medlab Timaru	132	100.0	-	0.0	132	100.0	-	0.0	**132**
Memorial Hospital Hastings Lab	84	96.6	3	3.4	87	100.0	-	0.0	**87**
Middlemore Hospital Laboratory	736	88.1	98	11.7	834	99.9	1	0.1	**835**
Nelson Hospital Laboratory	386	84.5	68	14.9	454	99.3	3	0.7	**457**
North Shore Hospital Laboratory	1,002	93.0	73	6.8	1,075	99.8	2	0.2	**1,077**
Northland Pathology Laboratory	368	95.8	14	3.6	382	99.5	2	0.5	**384**
Pathlab	702	95.8	14	3.6	382	99.5	2	0.5	**384**
Southern Community Labs Ch-Ch	1,607	87.9	207	11.3	1,814	99.2	15	0.8	**1,829**
Southern Community Labs Dunedin	191	81.6	17	7.3	208	88.9	26	11.1	**234**
Southland Hospital Laboratory	12	66.7	6	33.3	18	100.0	-	0.0	**18**
Taranaki Medlab	243	98.0	4	1.6	247	99.6	1	0.4	**248**
Waikato Hospital Laboratory	145	67.4	65	30.2	210	97.7	5	2.3	**215**
Wellington Hospital Laboratory	364	62.8	210	36.2	574	99.0	6	1.0	**580**
Total	**10,178**	**81.9**	**1,988**	**16.0**	**12,166**	**97.9**	**263**	**2.1**	**12,429**

Target: 90% within five working days and 100% within a reasonable time period of receipt of the sample

** 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 reporting period, while 5.4 includes all histology samples* taken *within the reporting period*

Table 51 – Timeliness of reporting for cytology with associated HPV triage testing by laboratory, 1 January to 30 June 2010

Laboratory	Laboratory turnaround time				
	Within 15 days		More than 15 days		Total
	N	%	N	%	N
Aotea Pathology Ltd	25	8.9	255	91.1	280
Canterbury Health Laboratories	56	28.9	138	71.1	194
Diagnostic Medlab Ltd	720	97.6	18	2.4	738
LabPLUS	6	100.0	-	0.0	6
Medlab Central	106	99.1	1	0.9	107
Medlab South Christchurch	310	100.0	-	0.0	310
Pathlab	213	96.8	7	3.2	220
Southern Community Labs Ch-Ch	378	85.7	63	14.3	441
Southern Community Labs Dunedin	87	96.7	3	3.3	90
Total	**1,901**	**79.7**	**485**	**20.3**	**2,386**

Tests in women with low grade cytology results; excludes tests in women with abnormal cytology in the five preceding years or aged less than 30 years

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

Table 52 – Women (ages 20-69 years) 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	173	122	70.5	137	79.2
Bay of Plenty	117	91	77.8	98	83.8
Canterbury	259	197	76.1	219	84.6
Capital & Coast	82	64	78.0	72	87.8
Counties Manukau	174	132	75.9	146	83.9
Hawke's Bay	120	103	85.8	108	90.0
Hutt Valley	53	43	81.1	47	88.7
Lakes	58	47	81.0	49	84.5
Mid Central	94	79	84.0	83	88.3
Nelson Marlborough	74	63	85.1	69	93.2
Northland	68	53	77.9	55	80.9
Otago	113	102	90.3	109	96.5
South Canterbury	20	12	60.0	15	75.0
Southland	63	40	63.5	42	66.7
Tairawhiti	17	15	88.2	15	88.2
Taranaki	64	44	68.8	54	84.4
Waikato	211	166	78.7	178	84.4
Wairarapa	19	16	84.2	17	89.5
Waitemata	194	157	80.9	169	87.1
West Coast	13	9	69.2	11	84.6
Whanganui	27	19	70.4	19	70.4
Total	**2,013**	**1,574**	**78.2**	**1,712**	**85.0**

Table 53 - Women (ages 20-69 years) 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	%
20-24	453	352	77.7	389	85.9
25-29	386	307	79.5	337	87.3
30-34	330	263	79.7	285	86.4
35-39	270	218	80.7	235	87.0
40-44	187	156	83.4	163	87.2
45-49	135	110	81.5	118	87.4
50-54	98	64	65.3	72	73.5
55-59	62	40	64.5	43	69.4
60-64	58	43	74.1	45	77.6
65-69	34	21	61.8	25	73.5
Total	**2,013**	**1,574**	**78.2**	**1,712**	**85.0**

Table 54 - Women (ages 20-69 years) without any follow-up test within 180 days and within 360 days of a high grade cytology report, by DHB

DHB	High-grade cytology	Without a follow-up test by 180 days		Without a follow-up test by 360 days	
	N	N	%	N	%
Auckland	173	19	11.0	14	8.1
Bay of Plenty	117	8	6.8	6	5.1
Canterbury	259	9	3.5	7	2.7
Capital & Coast	82	4	4.9	3	3.7
Counties Manukau	174	15	8.6	9	5.2
Hawke's Bay	120	8	6.7	3	2.5
Hutt Valley	53	5	9.4	4	7.5
Lakes	58	5	8.6	2	3.4
Mid Central	94	5	5.3	1	1.1
Nelson Marlborough	74	4	5.4	3	4.1
Northland	68	3	4.4	0	0.0
Otago	113	8	7.1	3	2.7
South Canterbury	20	1	5.0	0	0.0
Southland	63	4	6.3	2	3.2
Tairawhiti	17	2	11.8	1	5.9
Taranaki	64	3	4.7	1	1.6
Waikato	211	16	7.6	11	5.2
Wairarapa	19	-	0.0	0	0.0
Waitemata	194	13	6.7	9	4.6
West Coast	13	1	7.7	0	0.0
Whanganui	27	2	7.4	2	7.4
Unspecified	-	-	-	-	-
Total	**2,013**	**135**	**6.7**	**81**	**4.0**

Table 55 - Women (ages 20-69 years) without any follow-up test within 180 days and within 360 days of a high grade cytology report, by ethnicity

Ethnicity	High-grade cytology	Without a follow-up test by 180 days		Without a follow-up test by 360 days	
	N	N	%	N	%
Māori	352	38	10.8	23	6.5
Pacific	87	8	9.2	7	8.0
Asian	124	12	9.7	8	6.5
European/Other	1,450	77	5.3	43	3.0
Total	**2,013**	**135**	**6.7**	**81**	**4.0**

Indicator 8 – HPV tests

Table 56 – Triage† testing of women with ASC-US cytology

Laboratory*	Total ASC-US results		Women with an HPV test			
	women aged < 30yrs	women aged 30+ yrs	women aged < 30yrs		women aged 30+ yrs	
	N	N	N	%	N	%
Aotea Pathology Ltd	168	123	2	1.2	120	97.6
Canterbury Health Laboratories	67	161	2	3.0	125	77.6
Diagnostic Medlab Ltd	465	874	0	0.0	382	43.7
LabPLUS	16	37	0	0.0	5	13.5
Medlab Central	74	102	0	0.0	49	48.0
Medlab South Christchurch	139	223	0	0.0	204	91.5
Pathlab	156	212	1	0.6	111	52.4
Southern Community Labs Ch-Ch	176	222	3	1.7	181	81.5
Southern Community Labs Dunedin	43	53	0	0.0	38	71.7
Total	**1,304**	**2,007**	**8**	**0.6**	**1,215**	**60.5**

† As defined on page 79. Excludes tests in women with abnormal cytology in the five preceding years

** 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 57 – Triage testing of women with LSIL cytology

Laboratory*	Total LSIL results		Women with an HPV test			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
	N	N	N	%	N	%
Aotea Pathology Ltd	342	162	4	1.2	154	95.1
Canterbury Health Laboratories	152	81	4	2.6	67	82.7
Diagnostic Medlab Ltd	979	740	4	0.4	353	47.7
LabPLUS	20	12	0	0.0	1	8.3
Medlab Central	201	111	1	0.5	58	52.3
Medlab South Christchurch	215	124	3	1.4	103	83.1
Pathlab	359	189	6	1.7	102	54.0
Southern Community Labs Ch-Ch	614	319	15	2.4	240	75.2
Southern Community Labs Dunedin	166	95	3	1.8	52	54.7
Total	**3,048**	**1,833**	**40**	**1.3**	**1,130**	**61.6**

** 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*

Excludes tests in women with abnormal cytology in the five preceding years

Table 58 – Invalid HPV triage tests following ASC-US cytology, by laboratory

	Women with HPV tests (ASC-US cytology)		Women with invalid HPV results			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
Laboratory	**N**	**N**	**N**	**%**	**N**	**%**
Aotea Pathology Ltd	1	120	0	0	0	0.0
Canterbury Health Laboratories	3	126	0	0	0	0.0
Diagnostic Medlab Ltd	0	382	0	0	2	0.5
LabPLUS	0	5	0	0	0	0.0
Medlab Central	0	49	0	0	1	2.0
Medlab South Christchurch	1	204	0	0	0	0.0
Pathlab	1	110	0	0	1	0.9
Southern Community Labs Ch-Ch	2	211	0	0	0	0.0
Southern Community Labs Dunedin	0	8	0	0	0	0.0
Total	**8**	**1,215**	**0**	**0**	**4**	**0.3**

** Where the laboratory which performed the cytology test differs from the laboratory which performed the HPV test, classification is according to the laboratory which performed the HPV test, therefore laboratory totals may differ from those in Table 56*
Excludes tests in women with abnormal cytology in the five preceding years

Table 59 – Invalid HPV triage tests following LSIL cytology, by laboratory

	Women with HPV tests (LSIL cytology)		Women with invalid HPV results			
	aged < 30yrs	aged 30+ yrs	aged < 30yrs		aged 30+ yrs	
Laboratory	**N**	**N**	**N**	**%**	**N**	**%**
Aotea Pathology Ltd	4	154	0	0	4	2.6
Canterbury Health Laboratories	6	71	0	0	1	1.4
Diagnostic Medlab Ltd	1	352	0	0	9	2.6
LabPLUS	3	5	0	0	1	20.0
Medlab Central	0	57	0	0	1	1.8
Medlab South Christchurch	2	100	0	0	0	0.0
Pathlab	4	100	0	0	2	2.0
Southern Community Labs Ch-Ch	19	283	0	0	0	0.0
Southern Community Labs Dunedin	1	8	0	0	0	0.0
Total	**40**	**1,130**	**0**	**0**	**18**	**1.6**

** 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 HPV test, therefore laboratory totals may differ from those in Table 57*
Excludes tests in women with abnormal cytology in the five preceding years

Table 60 – Validity of HPV triage tests, by test technology

Test technology	Total HPV triage test results	Invalid		Valid	
	N	N	%	N	%
Abbott RealTime	111	-	0	111	100
Amplicor PCR	1,130	13	1.2	1,117	98.8
Digene HC2	-	-	0.0	-	0.0
Roche Amplicor	385	4	1.0	381	99.0
Roche Linear Array	-	-	0.0	-	0.0
Other	767	5	0.7	762	99.3
Total	**2,393**	**22**	**0.9**	**2,371**	**99.1**

Appendix B – Bethesda 2001 New Zealand Modified (2005)

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 vaginalis
O2	There are fungal organisms morphologically consistent with Candida species
O3	There is a shift in microbiological flora suggestive of 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 at the usual screening interval
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	Further assessment is recommended
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
Atypia		M69700	M67000	CIN 1	7
HPV, koilocytosis, condyloma (NOS) Condyloma acuminatum	 M76700	M76700 M76720	M76700 M76720	HPV	9
Dysplasia / CIN NOS		M74000	M67015	CIN 1	10
CIN I (LSIL) (VAIN I when used with T81/ T82000)		M74006	M67016	CIN 1	11
CIN II (HSIL) (VAIN II when used with T81/ T82000)		M74007		CIN 2	15
CIN III (HSIL) (VAIN III when used with T81/ T82000) Carcinoma in situ		M74008 M80102 M80702	 M80102 M80702	CIN 3	16 17 18
HSIL NOS		M67017	M67017	HSIL	14
Polyp		M76800	M76800	Negative/benign	5
Other (Morphologic abnormality, not dysplastic or malignant)		M01000	M01000	Negative/benign	6
Microinvasive squamous cell carcinoma		M80765	M80763	Micro-invasive	19
Invasive squamous cell carcinoma		M80703	M80703	Invasive SCC	22
Benign glandular atypia		M81400	M67030	Negative/benign	8
Glandular dysplasia		M81401	M67031	Glandular dysplasia	12
Adenocarcinoma in situ		M81402	M81402	Adenocarc. in situ	13
Invasive adenocarcinoma		M81403	M81403	Invasive adenocarcinoma	21
Adenosquamous carcinoma		M85603	M85603	Adenosquamous carcinoma	20
Metastatic tumour		M80006	M80006	Other cancer	28
Undifferentiated carcinoma		M80203	M80203	Other cancer	23
Sarcoma		M88003	M88003	Other cancer	24
Other codes accepted	**Code stored on register**	**1986 Code**	**1993 Code**	**Diagnostic category**	**Rank**
Carcinosarcoma	M88003	M89803	M89803	Other cancer	25
Choriocarcinoma	M80003	M91003	M91003	Other cancer	26
Miscellaneous primary tumour	M80003	M80003	M80003	Other cancer	27
Small cell carcinoma	M80003	M80413	M80413	Other cancer	29
Malignant tumour, Small cell type	M80003	M80023	M80023	Other cancer	30
Melanoma	M80003	M87203	M87203	Other cancer	31
Other primary epithelial malignancy	M80003	M80103	M80103	Other cancer	32

** As defined by the NCSP Register histology diagnosis significance ranking*

Appendix D – Indicator Definitions Targets and Reporting Details

Positive predictive value calculations

Table 61 – 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/CIN2-3				p	x	x	b	b	b		
Squam MI 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 – 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; CIN2 or 3: high grade
CIS	Carcinoma in situ. An older classification of CIN3. 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
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
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