National Screening Unit

National Cervical Screening Programme

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1. Executive Summary

Purpose

This report describes analysis of data in relation to performance indicators for the National Cervical Screening Programme (NCSP), for the period 1 July 2008 to 31 December 2008.

Key points on performance/trends

Indicator 1 — Coverage

Target: 75% of eligible women with a screening test within the last three years

- Coverage target was met nationally (ages 25-69 years, and 20-69 years).
- Coverage target was met for specific five-year age groups between 35-64 years.
- Among women aged 25-69 years at the end of the period, coverage target was met by 17 of 21 DHBs.
- 14 of 21 DHBs achieved coverage of 75% or more among women aged 20-69 years at the end of the period.
- Coverage targets were not met for Māori, Pacific, or Asian women, either among those aged 25-69 years, or among those aged 20-69 years. Undercounting of these groups in the NCSP Register may partially explain the disparity between these groups and European women/ women in other ethnic groups. Adjustments made for undercounting improved coverage among these three groups, but coverage generally remained below the target level. While these adjustments reduced the disparity between coverage in each of Māori, Pacific, and Asian women, compared to European women/women in other ethnic groups, some disparities remained. Thus, undercounting of some ethnic groups does not fully account for disparities in coverage between ethnic groups.
- 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 rates 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.
- Coverage has increased nationally, and particularly in Māori and Pacific women (from 48.5% to 54.3% and 47.6% to 57.6% respectively in women aged 20-69 years, compared to coverage in the three years to 31 December 2007).

Screens in women aged less than 20 years

Target: None

- In the three years to 31 December 2008, there were 21,990 women

who had a cervical sample taken when they were aged less than 20 years.
- This represents 2.4% of all women who were screened in the three-year period.
- Most of these women were aged 18-19 years (73%).

Indicator 2

First screening events

Target: None

- New indicator.
- First screening events generally occur among young women (median age 27 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 32 years and 30 years, respectively) than Māori women and European women/ women from other ethnic groups (median ages of women with a first screening event 22 years and 26 years, respectively).

Indicator 3

Withdrawal rates

Target: Zero between ages 20-69 years

- 110 women aged between 20-69 years withdrew from the register during this six month period (0.008% of those enrolled as at 1 July 2008).

Indicator 4

Early re-screening

New (cohort-based) definition

Target: Not yet defined

- New definition is being used, for which a target has not yet been set.
- Approximately 29% of a cohort of women with a recommendation to return at the routine interval (three years) 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, and least common among Pacific women.

Previous (interval-based) definition

Target: No more than 10% of women screened with an early re-screening event

- Nine out of 21 DHBs met the old target (no more than 10% attending for re-screening over the period, irrespective of the follow-up time for each individual.
- Early re-screening (calculated via the same method employed in the previous report) exceeds the target level for all age groups except women aged 60-69 years.

- Early re-screening (calculated via the same method employed in the previous report) has increased.

Indicator 5.1 Cytology reporting

Unsatisfactory cytology

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

- Percent unsatisfactory target met nationally, and by six out of nine laboratories.
- Nationally, the rate of unsatisfactory cytology has decreased slightly for both conventional and liquid based cytology since the previous report.

Negative cytology

Target: No more than 96% of cytology samples

- Percent cytology negative target met nationally and by all laboratories.

Abnormal cytology

Target: No more than 10% of cytology samples

- Percent cytology abnormal target met nationally and by seven out of nine laboratories.
- Nationally, the rate of abnormal cytology has increased slightly since the previous report.

HSIL cytology

Target: No less than 0.6% of cytology samples

- Percent cytology HSIL target met nationally and by seven out of nine laboratories.

Indicator 5.2 Cytology positive predictive value

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 out of nine laboratories met the maximum target for HSIL+SC of 85%.
- Positive predictive value for HSIL+SC has increased nationally since the previous report.
- Positive predictive value of ASC-H has decreased slightly nationally since the previous report.
- Positive predictive value of the combination of ASC-H+HSIL+SC has increased slightly nationally since the previous report.

Indicator 5.3 Accuracy of negative cytology reports

Not assessed

Indicator 5.4 Histology reporting

Target: None

- 13,787 histology samples were taken during the current reporting period; 334 (2.4%) were unsatisfactory.
- Results for most severe histology from 11,882 women are presented.
- 53% of women had histology samples which were benign.
- 20.3% of women had HSIL histology results.
- 65 (0.5%) women had ISCC histology results, and 55 (0.5%) women had invasive adenocarcinoma histology results.

Indicator 5.5 Turnaround times

Cytology

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

- Targets for cytology turnaround time were not met nationally, but were met by five out of nine laboratories (seven day target) and four out of nine laboratories (15 day target). A total of eight out of nine laboratories had reported on more than 95% of samples within 15 days.
- Turnaround time performance has improved for cytology since the previous report.

Histology

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

- Turnaround times for histology were slightly below the target nationally, but were met by 12 of 21 laboratories (five day target) and 13 of 21 laboratories (15 day target). 19 of the 21 laboratories had reported on more than 95% of samples within 15 days.
- Turnaround time performance is slightly worse for histology since the previous report.

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

Histological follow-up

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

- Targets were not met nationally. One DHB (Southland) met the target of 90% of women with a histology report within 90 days of their cytology report; no DHB met the target of 99% within 180 days.
- 77.9% of women had a histology report within 90 days of their high grade cytology report; 84.4% have one within 180 days.

	Any follow-up tests **Target:** None • More than 90% of women nationally have a follow-up test (colposcopy, subsequent cytology, histology) within 180 days of their cytology report. This is true for all DHBs, except Counties Manukau (88.7%) and Waikato (88.5%). • By 360 days, more than 95% of women nationally have a follow-up test report.
Indicator 7	<u>Colposcopy indicators</u> Not assessed

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. The Health (National Cervical Screening Programme) Amendment Act, which came into effect in 2004, 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.

Because this is the first report being undertaken by CCNSW, it was produced in close collaboration with the NCSP as a verification of the handover process, to ensure consistent interpretation of the national indicator measures. This first report also contains additional exploratory analyses, for example in regard to the calculation of early re-screening.

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 and to update denominator population data. Other indicators, such as the accuracy of negative cytology reports, are in development and 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 (refer www.nsu.govt.nz/health-professionals/1072.asp). The group may make recommendations to the NSU for follow-up actions.

Further information about the monitoring and performance of the NCSP is available 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. 31 December 2008.

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 2006 data was taken from these estimates. 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 1 January 2007 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 2001 Census population, projected to 2006. This method was used, rather than directly using the 2006 Census population, firstly to allow comparison with previous reports, and secondly because at the time the analysis was performed, estimates were not available from the 2006 census for Asian women by DHB (rather, Asian women were grouped with European women/ women from other ethnic groups within each DHB).

While both the hysterectomy prevalence estimates and the underlying population estimates were the best estimates available at the time of the analysis, both are becoming outdated. Both relate to 2006, while this report covers a period up until the end of 2008. The population estimate is also compromised by being a projection, rather than being directly based on the 2006 Census. 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 an ethnic group is growing faster than was projected, and in comparison to other ethnic groups; or if the age-specific prevalence of hysterectomy has changed more in some DHBs than in others.

Ethnicity analysis

The analysis by ethnicity considered four groups – Māori, Pacific, Asian, or European/ Other, based on their priority two ethnicity codes recorded on the NCSP Register. Women for whom ethnicity information was not available were included in the "European/ Other" category. The data download used for the current analysis (NCSP Register data as at July 2010) contained ethnicity codes for approximately 93% 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 women) 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 women/ women in other ethnic groups.

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 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 women/ women in other ethnic groups. In this monitoring report, ethnicity adjustors for 2006 from Wright 2008 are applied to counts derived from the NCSP Register to explore the potential impact of undercounting on ethnicity-specific indicators, such as coverage. Adjustors are also not used in any of the laboratory measures, which are not presented by ethnicity. For all measures presented by ethnicity, unadjusted estimates are provided as the main results, consistent with previous monitoring reports; adjusted estimates are provided for illustrative purposes.

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[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.

4. Biannual NCSP Monitoring Indicators

Indicator 1 – Coverage

Definition

Previously, defined as the proportion of all 20-69 year old women who have had a screening event (cytology sample, HPV sample, or histology sample) taken in the 36 months prior to the end of the reporting period.

The new 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.

The 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.

Screening coverage for women aged 20-69 years is reported for comparability with prior reports; and screening coverage for women less than 20 years is also reported by DHB.

Target

75% of eligible women within three years

Current Situation

Coverage

814,977 (77.5%) women aged 25-69 at the end of the current reporting period had at least one cervical sample taken during the previous three years. This is above the target of 75%. 90.4% of women aged 25-69 at the end of the current reporting period had at least one cervical sample taken during the previous five years.

Among women aged 20-69 years at the end of the current reporting period, 896,184 (75.3%) had at least one cervical sample taken during the previous three years. This is higher than the coverage achieved in 2007 (71.5%). 87.23% of women aged 20-69 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 71.5% (Counties Manukau) to 86.6% (Taranaki). 17 of the 21 DHBs achieved the 75% target in women aged 25-69 years at the end of the period. Patterns were similar for coverage in women aged 20-69 years at the end of the period, and 14 DHBs had coverage of 75% or more in this age group (Figure 1, Table 23).

The target coverage of 75% of women screened at least once in 36 months was achieved for each of the specific five year age groups between 35-64 years, but not for women aged 20-34 years and 65-69 years. Coverage was lowest in women aged 20-24 years (57.5%), 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 (84.8%) (Figure 2, Table 22).

Three-yearly coverage also varied by ethnicity. Coverage targets of 75% were not met for Māori, Pacific, or Asian women, either between ages 20-69 years, or ages 25-69 years. Coverage in these groups for women aged 25-69 years was 55.4%, 59.7%, and 61.5% respectively. Among European/ Other, coverage achieved was 85.3% (Figure 3, Table 24). 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 (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 64.7% (Pacific) to 77.4% (European/ Other) among women aged 20-69 years, and from 66.3% (Māori) to 80.6% (Asian) among women aged 25-69 years. Adjusted estimates are shown in Table 25 and Table 26.

When compared to the findings for three-year coverage, five-year coverage had similar patterns of variation by age, DHB, and ethnicity. Five-year coverage varied by age from 63.4% in women aged 20-24 years to 98.0% in women aged 50-54 years (Figure 5, Table 27). Among women aged 25-69 years at the end of the period, five-year coverage ranged from 84.6% in Counties Manukau to 99.1% in Taranaki (Figure 4,Table 28), and from 67.5% (Māori) to 98.7% (European/ Other) (Figure 6, Table 29).

Screens in women aged less than 20 years

A total of 21,990 women who were aged less than 20 years at the time of their cervical sample had a cervical sample taken in the three years to 31 December 2008. 2.4% of women who were screened (at any age), were aged less than 20 years at the time their cervical sample was taken (Table 31).

The number of women aged less than 20 at the time they were screened varied by DHB from 149 (West Coast) to 3,475 (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 most common. Estimates for this proportion ranged from 7.9% (Waikato) to 19.0% (Canterbury). Some smaller DHBs screen a relatively low number of women when they are younger than 20 years, but because the population is small this equates to screening <20 year olds at a relatively high rate (South Canterbury, Southland). Details of screens of women aged less than 20 years by DHB are

presented in Figure 7, Table 31 and Table 30.

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 (73% overall; range across DHBs 63%-82%). This may represent opportunistic screening of women aged 18-19 years.

Trends

Overall coverage rates in New Zealand among women aged 20-69 years at the end of the monitoring period have increased from 71.5% in the three years to 31 December 2007 to 75.3% in the three years to 31 December 2008.

Coverage among Māori and Pacific women has increased since 2007, from 48.2% to 54.3% in Māori women, and from 47.6% to 57.6% in Pacific women.

Coverage among Asian women has not been reported previously in these biannual monitoring reports (although it was in monthly statistics produced by the National Screening Unit). Therefore trends in Asian women, and in European women/women in other ethnic groups, could not be assessed individually with accuracy. The overall coverage in Asian women and European/Other women aged 20-69 years in the previous three years has increased from 77.7% in 2007 to 80.1% in 2008, and this increase may not have occurred in all three groups. Analyses of coverage by Asian population group must be interpreted with caution as these results are not comparable with New Zealand studies and self-reported participation rates as noted in the 2006/07 New Zealand Health Survey.

The number of screens in women aged less than 20 years has increased in part due to a change in the definition. Women were included in this count if they were aged less than 20 years at the time of the cervical sample, rather than if they were still aged less than 20 years at the end of the monitoring period as previously.

Comments

The new calculation of coverage between the ages of 25-69 years restricts the measure of coverage to the five year age groups who were eligible for the entire duration of the three year period. This is consistent with reporting of coverage in other countries. For example, in the period when England recommended screening in women aged 20-64 years (prior to 2003, in which the screening start age was raised to 25 years), routine reporting of coverage was in the age group 25-64 years.

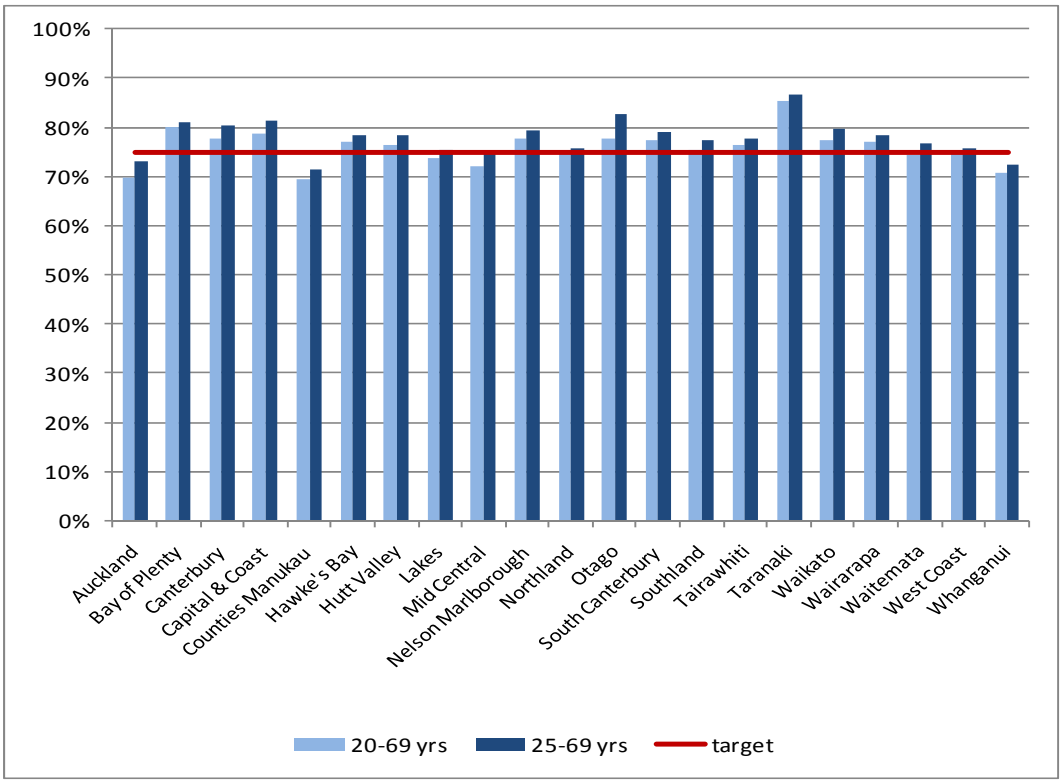
Measuring coverage among women who have been eligible for the entire period should result in a more meaningful coverage indicator. Coverage in women aged 20-24 years is likely to remain lower than for other ages and coverage in this age group should be interpreted with caution, as many women will have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

As discussed in the Methods section *Hysterectomy-adjusted population* (page 8), coverage must be interpreted with particular caution due to the limitations

in the estimates for the hysterectomy-adjusted population and the influence this estimate has on coverage.

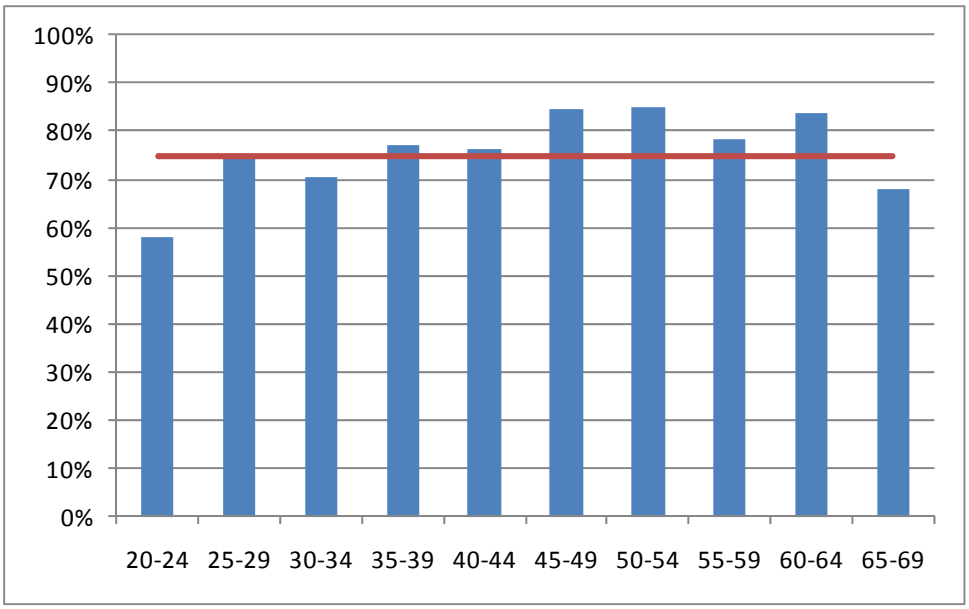
Misclassification of women's ethnicity (leading to under- and over-counting of different ethnicity groups) may be contributing in part to the differences in coverage achieved in different ethnicity groups. Our exploration of misclassification via ethnicity adjustors indicates that this is a factor, but 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 2006-2008 (three-year coverage), and 2004-2008 (five-year coverage). Like the primary (unadjusted) estimates, they also rely on the accuracy of the hysterectomy-adjusted population estimate.

Figure 1 - Three-year coverage by DHB (women screened in the three years prior to 31 December 2008, as a proportion of hysterectomy-adjusted 2006 female population)



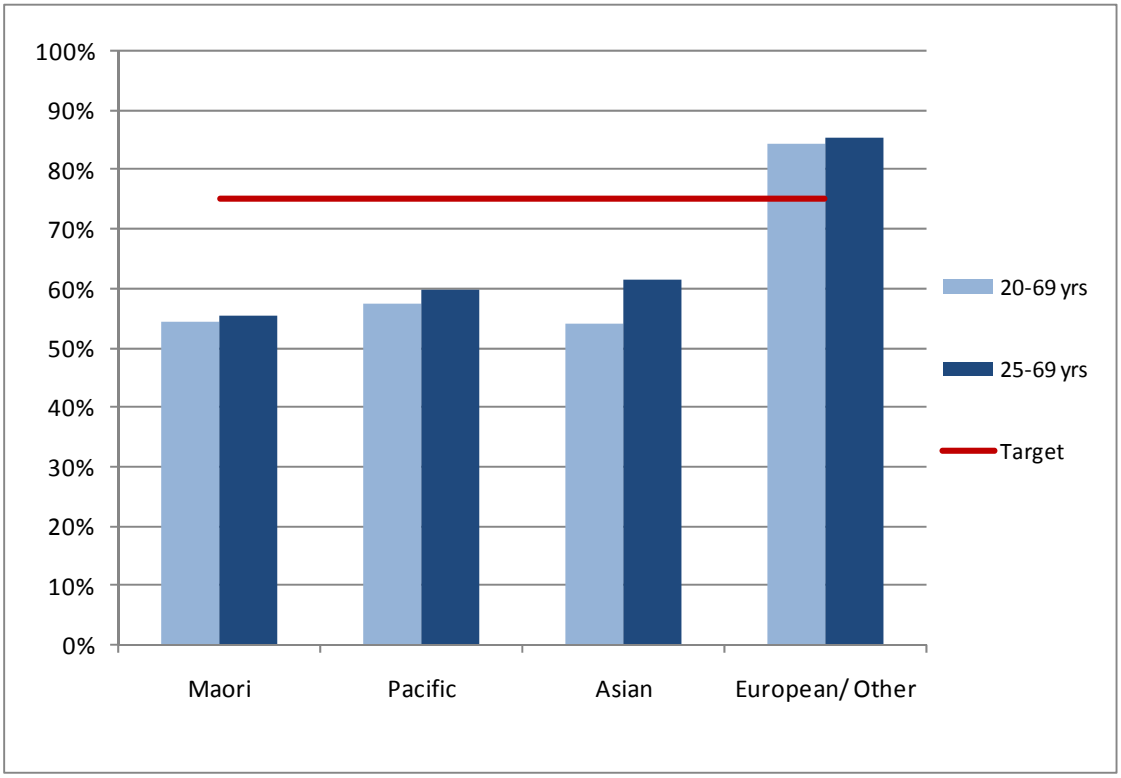
Note: Coverage calculated using population projection for 2006 based on 2001 Census data. Target 75%, hysterectomy adjusted.

Figure 2 - Three-year coverage by five-year age group (women 20-69 years screened in the three years prior to 31 December 2008, as a proportion of hysterectomy-adjusted 2006 female population)



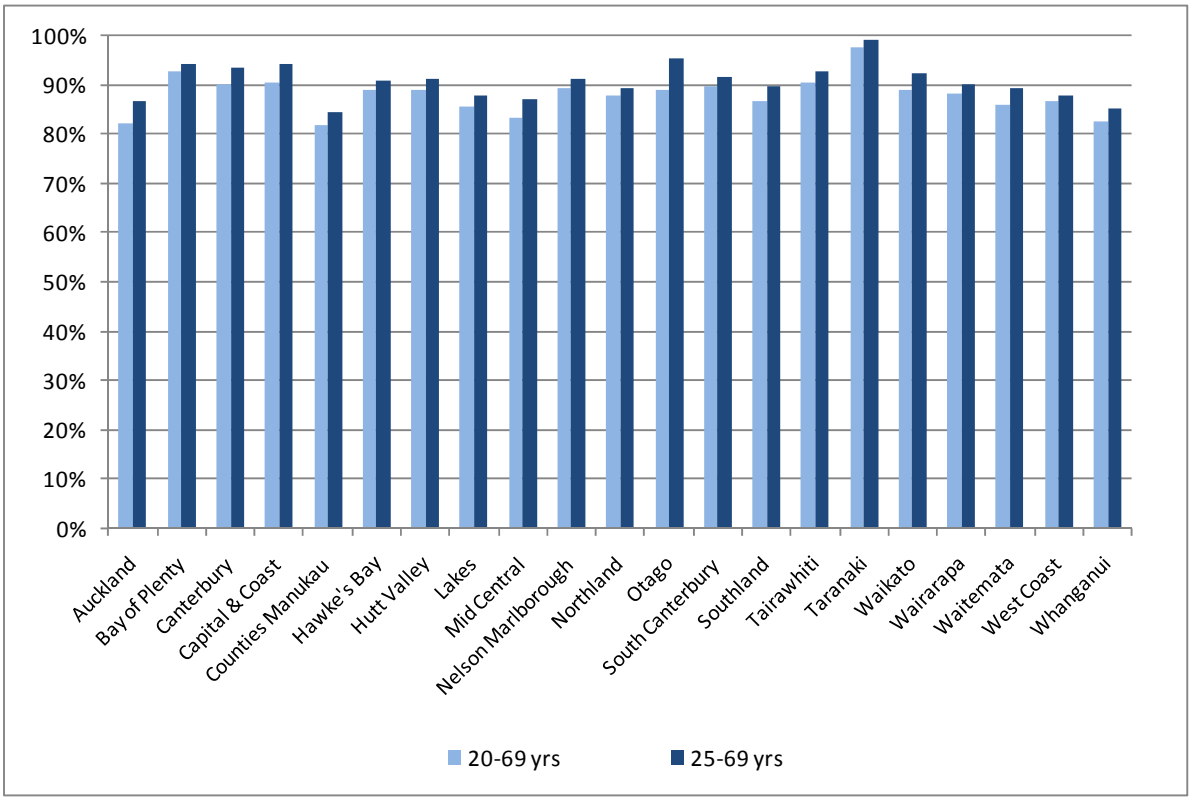
Note: Coverage calculated using population projection for 2006 based on 2001 Census data. (Target- red line) Target 75%, hysterectomy adjusted.

Figure 3 - Three-year coverage by ethnicity (women screened in the three years prior to 31 December 2008, as a proportion of hysterectomy-adjusted 2006 female population)



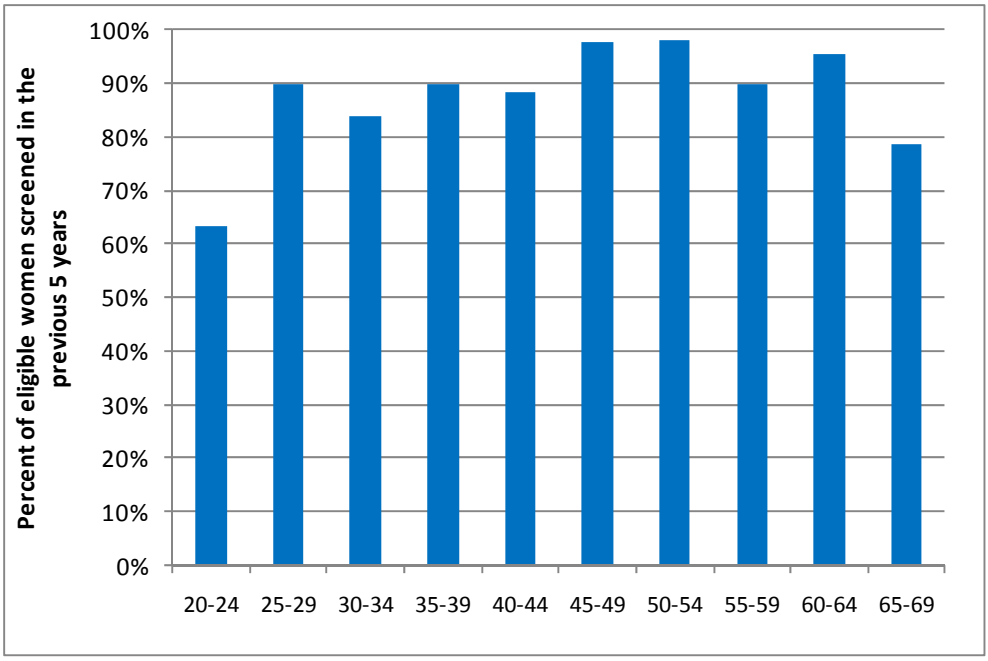
Note: Coverage calculated using population projection for 2006 based on 2001 Census data. Target 75%, hysterectomy adjusted.

Figure 4 - Five-year coverage by DHB (women screened in the five years prior to 31 December 2008, as a proportion of hysterectomy-adjusted 2006 female population)



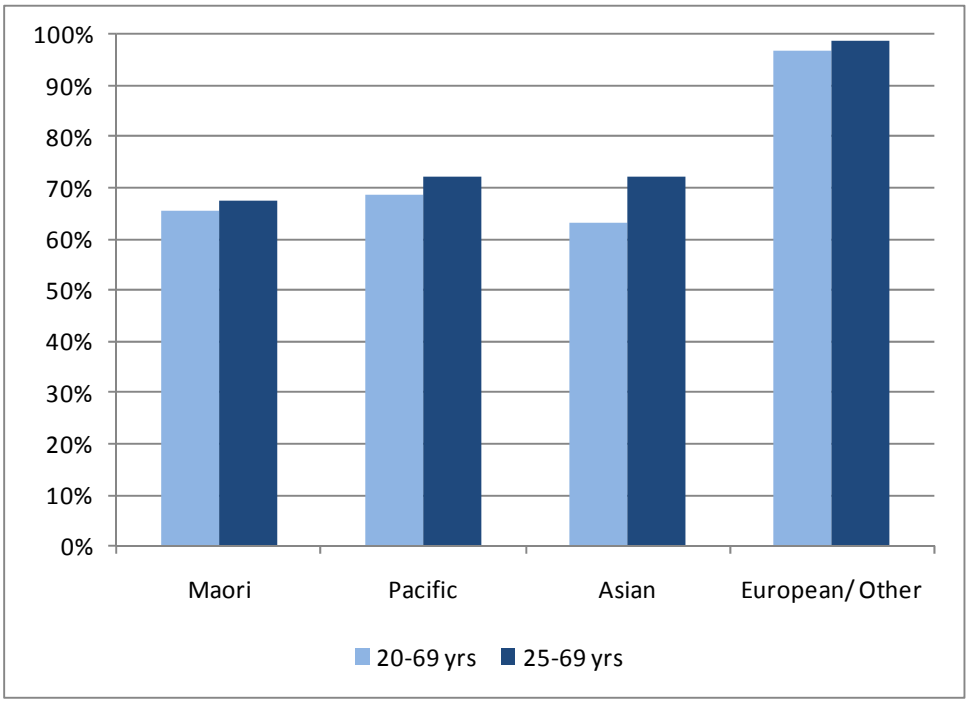
Note: Coverage calculated using population projection for 2006 based on 2001 Census data.

Figure 5 - Five-year coverage by five-year age-group (women screened in the five years prior to 31 December 2008, as a proportion of hysterectomy-adjusted 2006 female population)



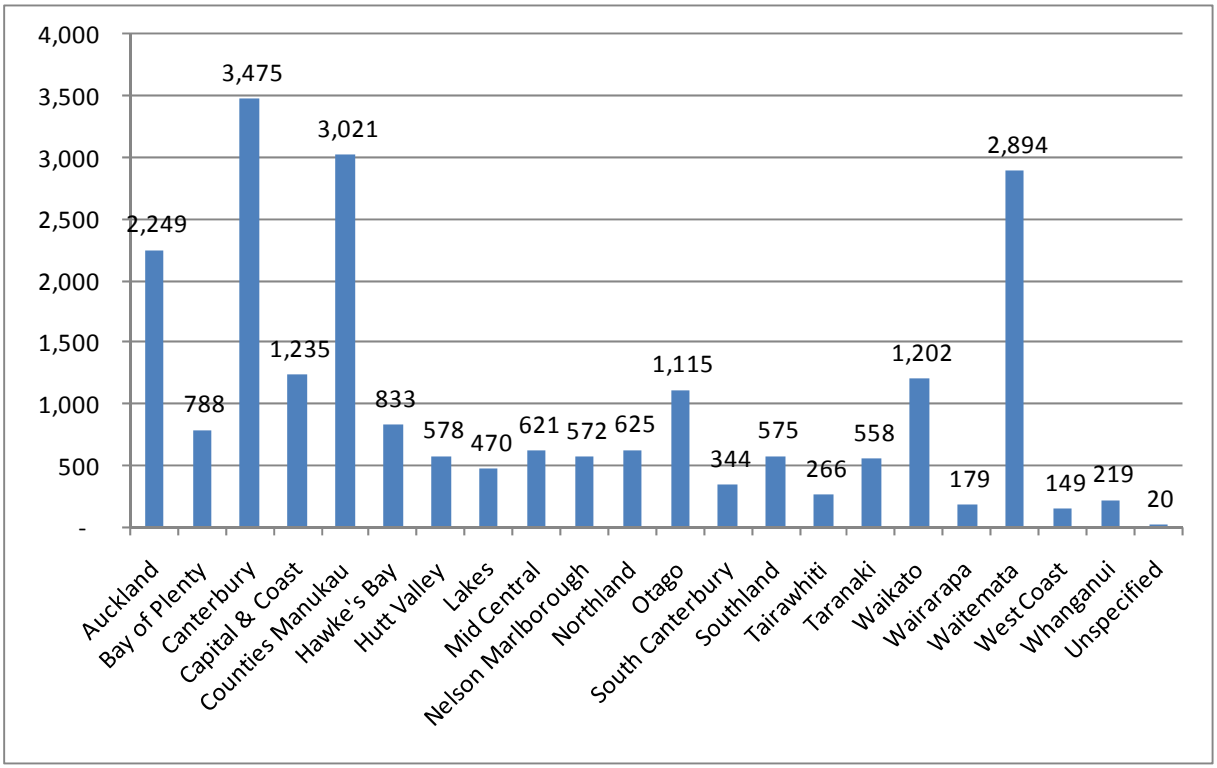
Note: Coverage calculated using population projection for 2006 based on 2001 Census data.

Figure 6 - Five-year coverage by ethnicity (women screened in the five years prior to 31 December 2008, as a proportion of hysterectomy-adjusted 2006 female population)



Note: Coverage calculated using population projection for 2006 based on 2001 Census data.

Figure 7 - Number of women screened who were less than 20 years of age at the time of their cervical sample in the three years to 31 December 2008, by DHB



Indicator 2 – First screening events

Definition

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

A woman's age is defined as her age at the end of the current reporting period (i.e. 31 December 2008).

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 20-29 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

23,024 women aged 20-69 years at the end of the period had their first screening event in the period 1 July – 31 December 2008. This constituted 10.7% of the 214,414 women aged 20-69 years with a cervical sample taken in the period (screening event), and 1.9% of the eligible population. The median age (at the end of the reporting period) of women with a first event recorded was 27 years.

The age group with the highest number of first screening events was women aged 20-24 years. 9,333 women aged 20-24 had their first screening event recorded on the register during this reporting period, accounting for 40.5% of all women aged 20-69 years with first screening events (Figure 8, Table 32). From this age group, first screening events decreased with increasing age. Women aged 20-24 years also had the highest proportion of eligible women at that age with a first screening event recorded (6.7%) (Figure 10).

The DHBs with the highest number of women aged 20-69 years with first screening events were Auckland (3,421), Waitemata (3,189), and Counties Manukau (3,009). The DHBs where women with first screening events, as a proportion of all women with screening events, was the highest were Auckland (14.0%), Counties Manukau (13.5%), and Capital Coast (12.1%). The DHBs where this proportion was lowest were Wairarapa (5.7%) and Tairawhiti (6.1%) (**Error! Reference source not found.**, Table 1).

The ethnic group with the highest number of women with first screening events was European/ Other (14,440) (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 (3.5%) (Table 2). The proportion of women screened who were being screened for the first time was also highest for Asian women (24.4%) (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 (24.4% for Asian women, 18.9% for Pacific women) also have an

	older median age of women with a first screening even (32 years for Asian women, 30 years for Pacific women) (Table 3). An exploratory analysis was also performed to investigate the potential impact of undercounting and overcounting in different ethnic groups. Adjustment for undercounting made only small differences to the proportion of women with screening events who were women with first screening events, and women with first screening events as a proportion of the eligible population (Table 33).
Trends	This measure has not been routinely measured previously, therefore trend analysis could not be performed.
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 is remains high in an area, 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). For example increasing coverage (from 47.6% to 2007, up to 57.6% to 2008 among women aged 20-69 years) may be the reason this proportion is relatively high in Pacific women.

Figure 8 - Number of women with a first screening event, by five-year age group

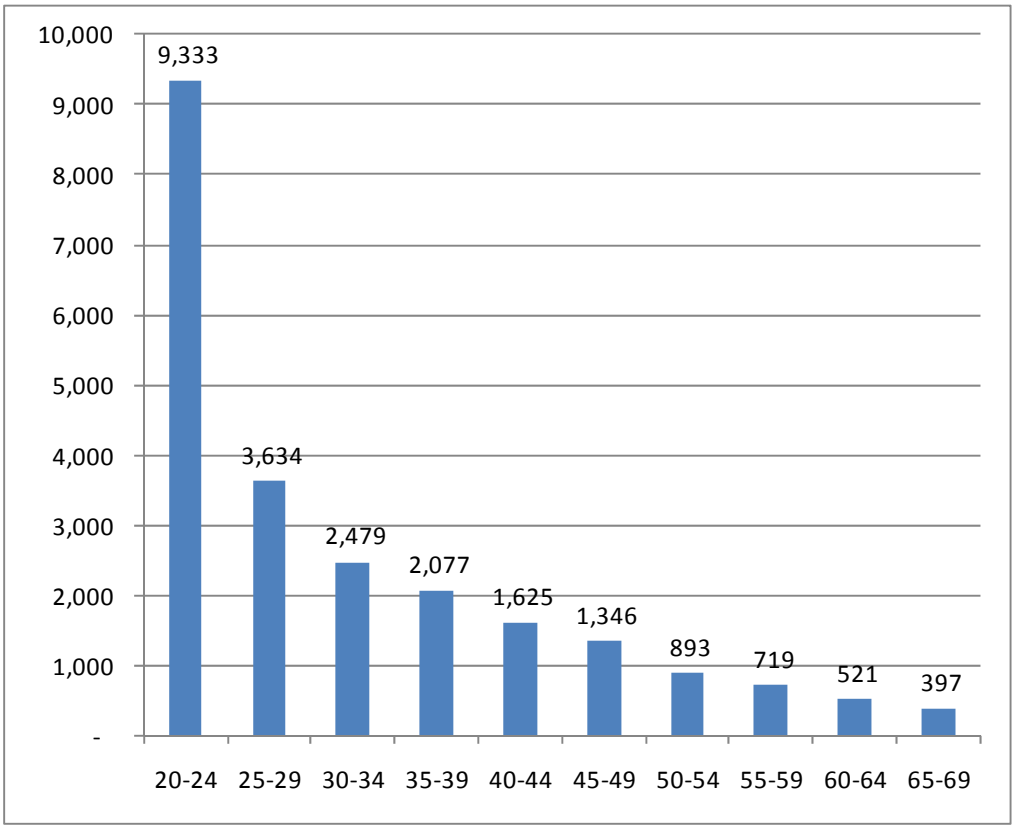


Figure 9 – Women with first screening events as a proportion of all women screened during the reporting period, by five-year age group (women aged 20-69 years)

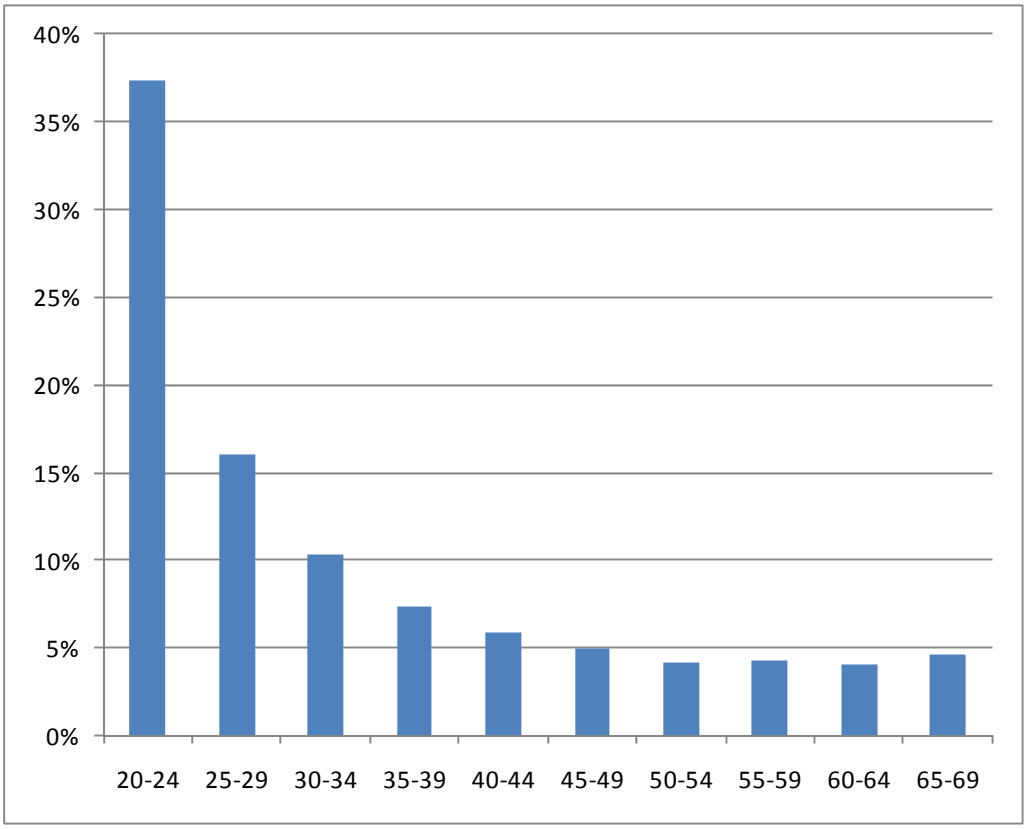
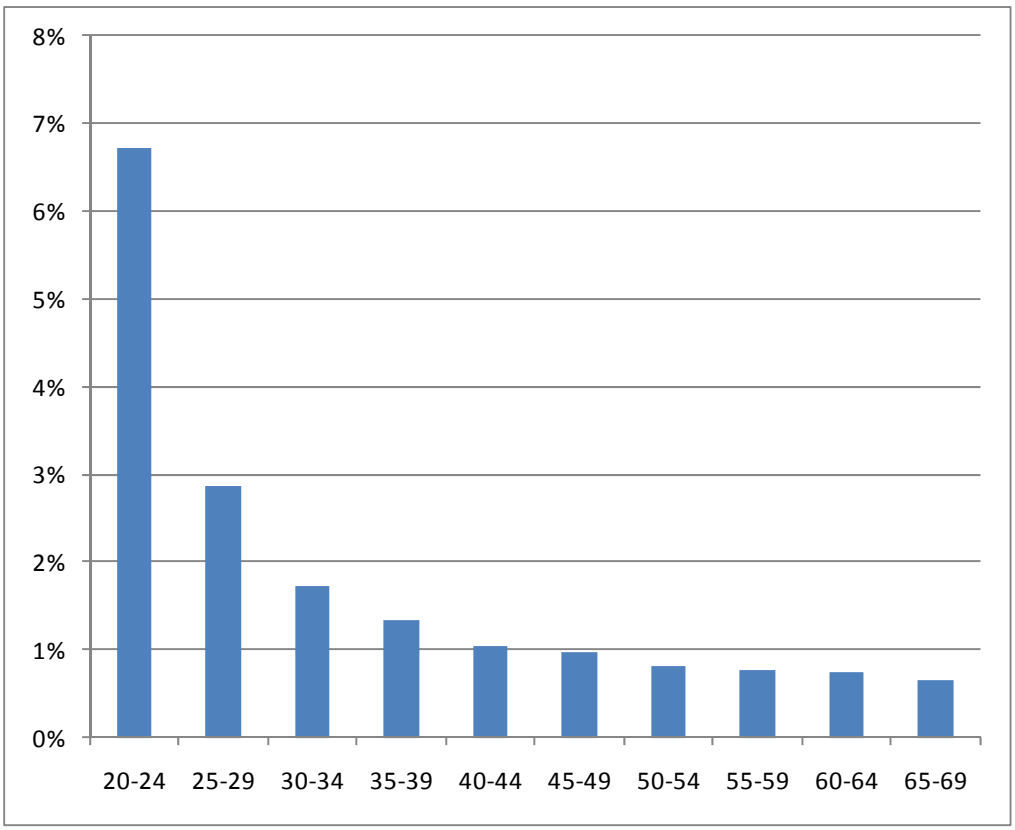


Figure 10 - Proportion of population* in that age group with their first screening event during the reporting period (women aged 20-69 years)



**Hysterectomy adjusted, 2006*

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)

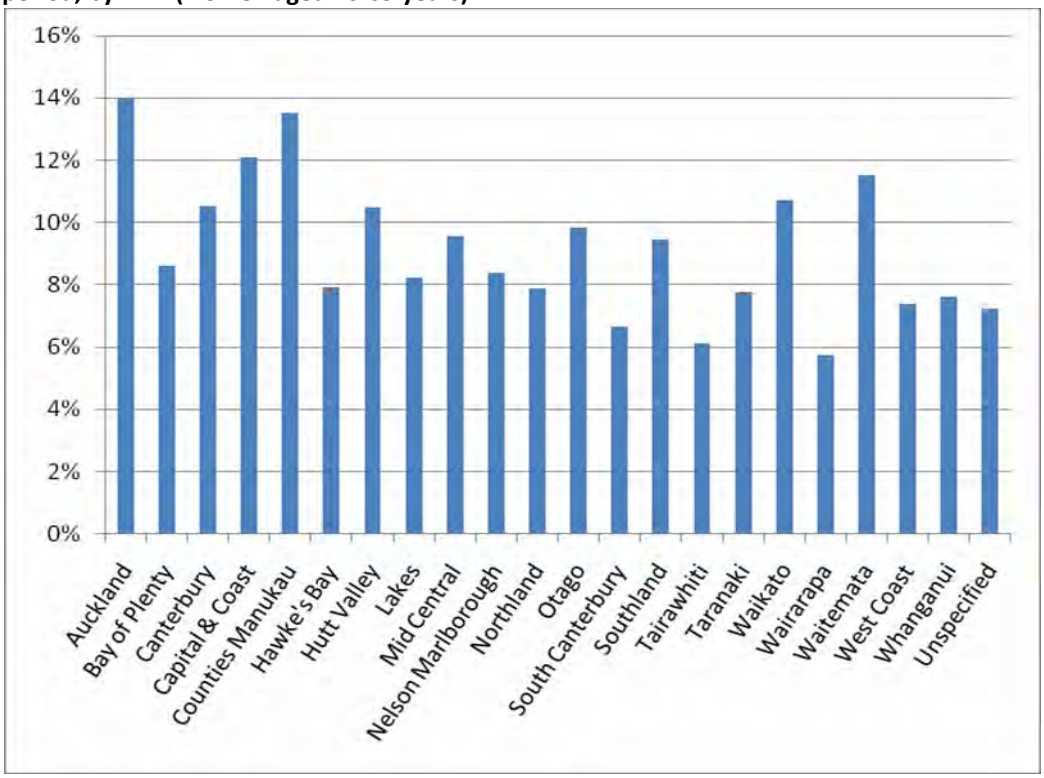


Figure 12 - Women with first screening events as a proportion of all women screened during the reporting period, by ethnicity

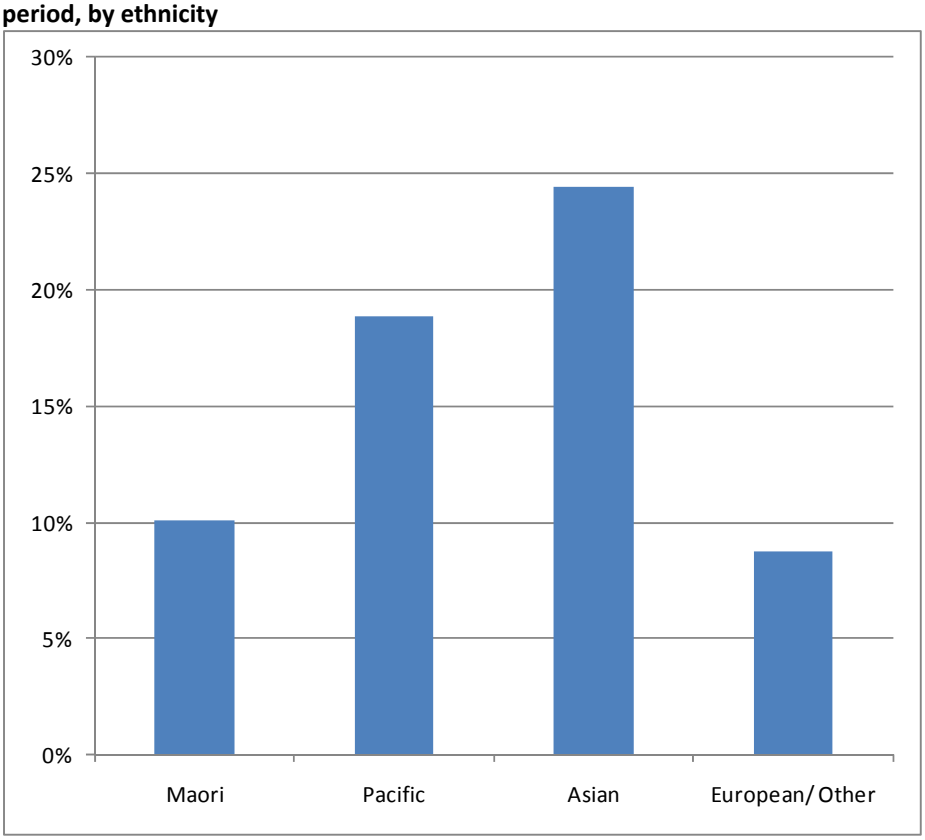


Table 1 - Women (ages 20-69 years) with first screening events as a proportion of i) total number of women with screening events, and ii) eligible women, by DHB, for period 1 July to 31 December 2008

DHB	Women with first events (20-69 yrs)	As a proportion of women with a screening event[i]		As a proportion of eligible population[ii]	
		N (20-69 yrs)	%	N	%
Auckland	3,421	24,478	14.0	139,690	2.4
Bay of Plenty	898	10,455	8.6	54,335	1.7
Canterbury	2,676	25,439	10.5	136,342	2.0
Capital & Coast	1,864	15,387	12.1	86,142	2.2
Counties Manukau	3,009	22,264	13.5	126,416	2.4
Hawke's Bay	589	7,422	7.9	41,024	1.4
Hutt Valley	683	6,510	10.5	39,406	1.7
Lakes	397	4,829	8.2	28,822	1.4
Mid Central	752	7,872	9.6	45,257	1.7
Nelson Marlborough	551	6,584	8.4	38,268	1.4
Northland	573	7,268	7.9	40,572	1.4
Otago	923	9,402	9.8	52,175	1.8
South Canterbury	167	2,513	6.6	14,366	1.2
Southland	509	5,376	9.5	30,987	1.6
Tairawhiti	142	2,319	6.1	12,037	1.2
Taranaki	409	5,275	7.8	28,295	1.4
Waikato	1,843	17,176	10.7	94,294	2.0
Wairarapa	111	1,931	5.7	10,529	1.1
Waitemata	3,189	27,682	11.5	146,592	2.2
West Coast	98	1,327	7.4	8,263	1.2
Whanganui	208	2,739	7.6	16,953	1.2
Unspecified	*12*	*166*	*7.2*	-	-
Total	**23,024**	**214,414**	**10.7**	**1,190,853**	**1.9**

Note: Proportions shown are women with first screening event within a DHB, divided by i) all women with a test event within that DHB (first or subsequent events(and ii) the hysterectomy-adjusted 2006 census population 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 July to 31 December 2008

Ethnicity	Women with first events (20-69 yrs)	As a proportion of women with a screening event[i]		As a proportion of eligible population[ii]	
		N (20-69 yrs)	%	N	%
Māori	2,182	21,591	10.1	163,913	1.3
Pacific	1,908	10,119	18.9	68,598	2.8
Asian	4,494	18,399	24.4	129,626	3.5
European/ Other	14,440	164,305	8.8	828,716	1.7

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

Ethnicity	Median Age (years)
Māori	22
Pacific	30
Asian	32
European/ Other	26

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 in the NCSP as at 30 June 2008, whose enrolment ended within the 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, 1,305,783 women aged 20-69 years and 1,434,153 women in total were enrolled on the NCSP Register. 111 women withdrew from the NCSP Register during the reporting period (0.008% of women who were enrolled at the commencement of the period). Among women aged between 20-69 years at the end of the period, 110 (0.008%) withdrew from the NCSP Register (Table 4). The DHBs with the largest number of withdrawals were Auckland (18 women) and Waitemata (17 women) (Figure 13, Table 34). 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 Mid Central, Southland, Wairarapa and West Coast during this period (Table 34). 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 65-69 years at the end of the period (0.023%) and women aged 60-64 years at the end of the period (0.020%). Among women aged 70 years or more at the end of the reporting period (outside the screening target age range), 0.001% withdrew during the reporting period (Table 2, Figure 14). The ethnic group with the highest proportion of women withdrawing was the combined group of all ethnicities other than Māori, Pacific and Asian, however the proportion was still extremely small (0.01%)(Table 5, Figure 15).
Trends	This measure has not been routinely measured previously as part of the biannual reports, therefore trend analysis could not be performed.
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 who withdrew from the Programme by DHB, 1 July 2008 - 31 December 2008

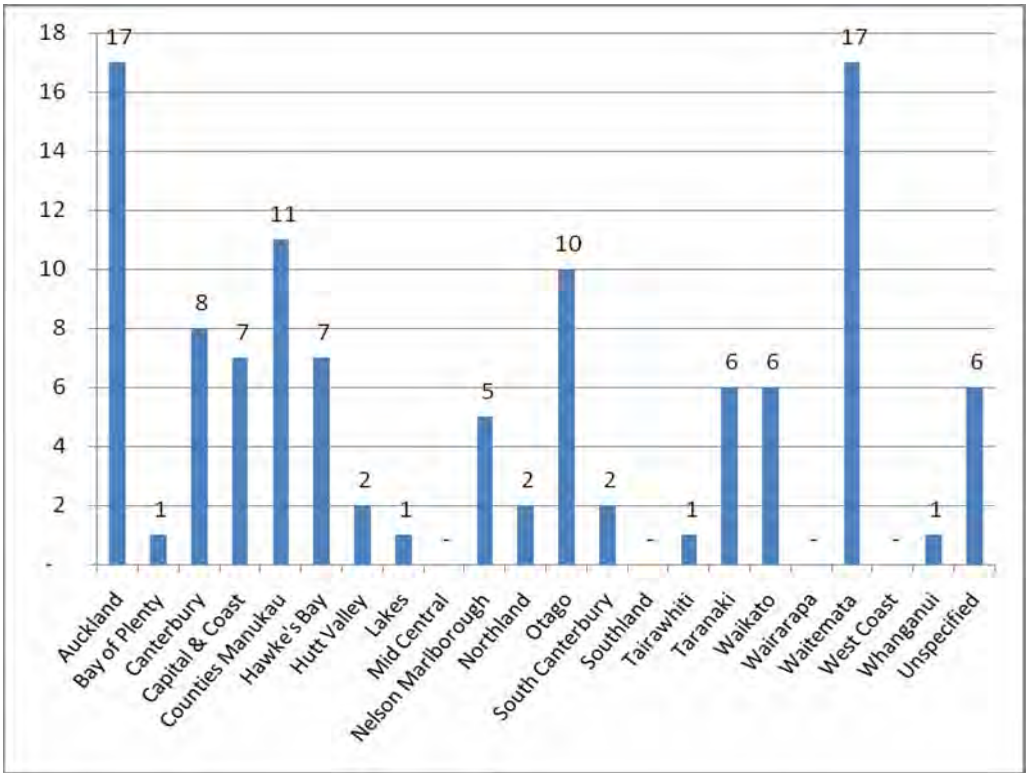


Figure 14 - Number of women who withdrew from the Programme by age, 1 July 2008 - 31 December 2008

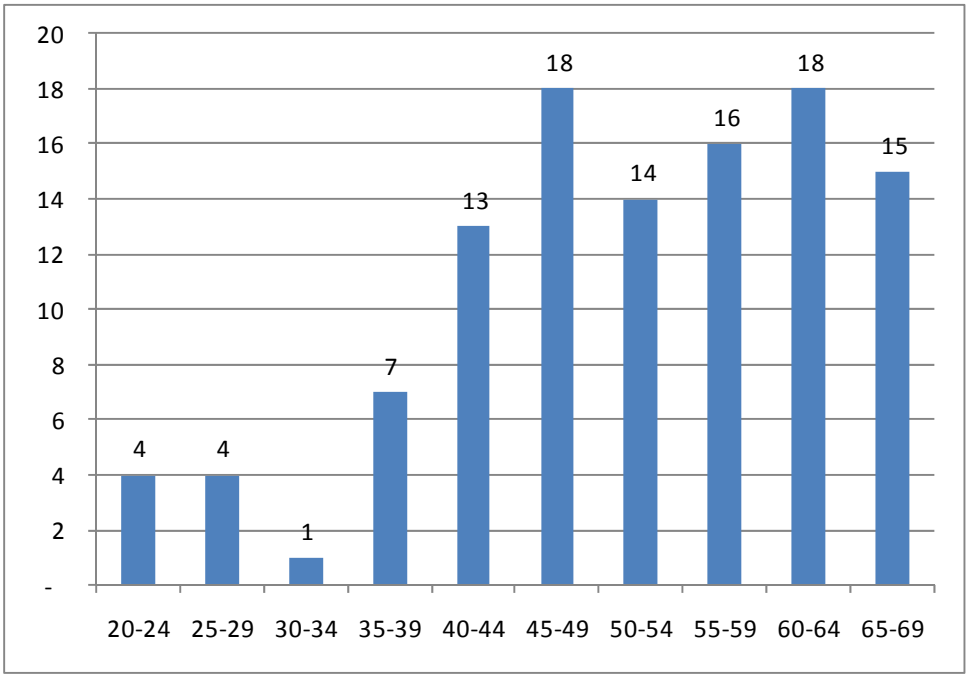


Figure 15 - Number of women who withdrew from the Programme by ethnicity, 1 July 2008 - 31 December 2008

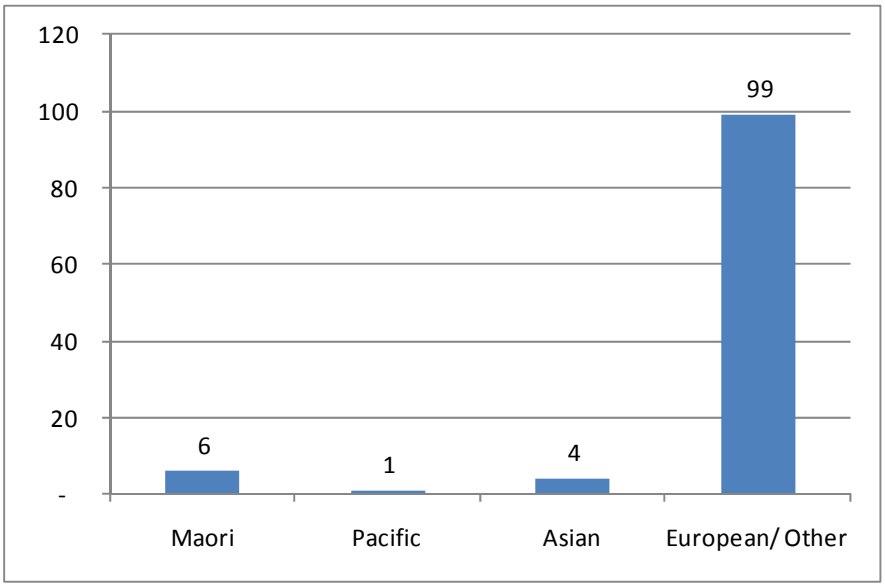


Table 4 - Number of women who withdrew from the Programme 1 July 2008 - 31 December 2008 by age, and proportion of women who were enrolled at the start of the reporting period who withdrew

Age group	Women enrolled at start of period	Women who withdrew during period	
		N	% *
<20	6,524	-	0
20-24	80,384	4	0.005
25-29	128,402	4	0.003
30-34	152,449	1	0.001
35-39	182,143	7	0.004
40-44	176,077	13	0.007
45-49	172,668	18	0.010
50-54	141,601	14	0.010
55-59	114,636	16	0.014
60-64	91,683	18	0.020
65-69	65,740	15	0.023
70+	121,846	1	0.001
Total (all ages)	**1,434,153**	**111**	**0.008**
Total (ages 20-69)	**1,305,783**	**110**	**0.008**

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

Table 5 - Number of women who withdrew from the Programme 1 July 2008 - 31 December 2008 by ethnicity, and proportion of women who were enrolled at the start of the reporting period who withdrew

Ethnicity	Women enrolled at start of period	Women who withdrew during period	
		N	% *
Māori	145,848	6	0.004
Pacific	65,710	1	0.002
Asian	94,520	4	0.004
European/ Other	999,705	99	0.010
Total	**1,305,783**	**110**	**0.008**

**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 February 2006 – 31 March 2006 (inclusive), who i) were aged 20 – 66 years at the time the smear was taken (and hence remained within the screening target age throughout the period); and ii) were given a recommendation to return at the regular interval of three years as a result of their smear in February/ March 2006 (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.

Previously, early re-screening was measured by considering an "interval-based measure" which estimated the proportion of 20-69 year old women who were recommended to return for their next smear at the routine screening interval within the previous 33 months, who had another smear within the 33 month period over which behaviour was assessed. It should be noted that when the measure was calculated in this way, screening behaviour for individuals was assessed over variable follow-up times, since follow-up stopped at the end of the period under consideration. Here we calculated the measure in this format for comparison with prior reports and also explored the impact of using a 30-month time window, compared to 33 months.

Under both definitions, this measure excludes women 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 result 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 31 December 2008).

Target

The previous target for the "interval based measure" was that the number of women with an early re-screening event should not exceed 10% of all women screened (previous calculation method).

A target has not yet been set for the cohort-based calculation method. The new method of calculation will result in a higher value than the old method (see Appendix F, starting on page 102 for detail).

Current Situation

Cohort (new) method

41,132 women had a smear taken in February or March 2008, were aged

between 20-66 years at the time of their smear, and were given a recommendation to return for their next smear at the routine interval of three years. Among these women, 12,071 (29.3%) had at least 1 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 (43.4%), Auckland (40.0%), and Lakes (39.2%), and was least common in Taranaki (13.5%), Otago (17.1%), Tairawhiti (17.1%), and West Coast (16.9%) (Figure 16, Table 38).

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 (36.2%), and older women (aged 65-69 years at the end of the period) were the least likely to be re-screened early (19%) (Figure 18, Table 35).

Among the ethnic groups considered, Asian women were the most likely to be re-screened early (34.7%). There was comparatively little difference between the other three groups, but Pacific women were the least likely to return early (25.8%) (Figure 20, Table 39).

Previous (interval-based) method

For comparability with previous monitoring reports, early re-screening was also estimated using the "interval based" methods described in previous reports. 791,843 women who were aged 20-69 at 31 December 2008 had at least one negative cytology test during the previous 33 months. Among these women, 591,808 women had at least one smear with a recommendation to return at the routine screening interval of three years. Subsequent analysis focuses on this group of women. The remaining 200,035 women had no smears with a recommendation to return at the routine screening interval, and were excluded from further analysis. More intensive follow-up had been recommended for these women for a variety of reasons, but most commonly due to a previous abnormality.

Using this method, among the 591,808 women with at least one recommendation to return at the routine screening interval, 71,706 (12.1%) are recorded as having at least one cytology test in the 33 month period which occurred after their cytology test with a recommendation indicating that no smear was required for three years. This national level of early re-screening is slightly above the target.

The extent of early re-screening according to this older "interval based" measure varied by both age and DHB.

Early re-screening varied widely by DHB, ranging from 5.5% in Taranaki to 18.2% in Waitemata (Figure 17). Nine DHBs met targets for early re-screening (Hutt Valley, Mid Central, Nelson Marlborough, Otago, Southland, Taranaki, Waikato, West Coast, Whanganui). Among the remaining 12 DHBs, early re-screening rates ranged from 10.3% (Tairawhiti) to 18.2% (Waitemata). Adjusting the fixed

time window considered to be 30 months long generally decreased the level of early re-screening, but this was not consistent, and the pattern was not exactly the same. Some DHBs changed from having comparatively high rates of early re-screening, to comparatively low rates (West Coast, Waikato). In two DHBs the shorter time window of 30 months increased the rate of early re-screening (Wairarapa, Waitemata). This is probably because the women who were screened in the missing three months (April-June 2006) tended to be those re-screened early in the former case, and tended to be those not re-screened early in the latter case.

Early re-screening also varied by age, from 8.4% in women 65-69 years to 13.3% in women aged 20-24 years. The early re-screening target of no more than 10% of women was met for women aged 60 and over (Figure 19, Table 36). Among the age groups where the target was not met, early re-screening rates ranged from 11.6% (55-59 years) to 13.3% (20-24 years). Adjusting the fixed time window considered to be 30 months long decreased the level of early re-screening for all age groups, but the pattern remained consistent.

Among the ethnic groups considered, Asian women were the most likely to be re-screened early (15.2%). There was comparatively little difference between the other three groups, but Pacific women were the least likely to return early (9.3%) (Figure 21). Adjusting the fixed time window considered to be 30 months long decreased the level of early re-screening for all groups, but the pattern remained consistent.

Trends

The level of early re-screening according to the older "interval based" measure is higher than reported in 2007, when it was 11.3%.

DHBs with the lowest and highest levels of early re-screening are largely unchanged since 2007, however exploration with a time window of 30 months, and a cohort-based approach which follows up all women for the same length of time, changed some DHBs from having comparatively high rates of early re-screening, to comparatively low rates (West Coast, Waikato).

Compared to 2007, early re-screening has reduced in women aged 20-24 years and aged 50 and over, but has increased in women aged 25-49 years. Age patterns remained similar with the new cohort method compared to the previously defined method, and with an adaptation of the previous method to use a shorter time window.

Patterns of early re-screening by ethnicity also remained similar with the new cohort method compared to the previously defined method, and with an adaptation of the previous method to use a shorter time window.

Methods used to calculate early re-screening according to the older "interval based" method have changed slightly since previous reports, so estimates may not be directly comparable.

Comments

Early re-screening was assessed based on cytology recommendation codes, in order to exclude from the early re-screening group women with a negative smear for whom an earlier screening visit is appropriate. Thus, only women with a recommendation that their next screening visit be in three years were eligible for inclusion in the early re-screening group (that is, in both the numerator and the denominator). Women excluded from the early re-screening group would include those who had just had their first smear or their first smear after a period of five years (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. Previous reports have not explicitly used recommendation codes to define the group of women of interest, and therefore the estimates for this measure may not be directly comparable.

The new cohort-based method applies a consistent follow-up time of 30 months to all women, and so is a more meaningful measure of how many women are re-screened early. Results from the previous approach probably underestimated early re-screening, as the exposure time (the period between her first routine smear in the 33-month period, and the end of the period) varies for each woman (see Appendix F, starting on page 102, for a more detailed discussion of the rationale and implications of this change in method).

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 new calculation is reliant on the correct use of R1 code in laboratory reports. For this reason, an exploratory analysis was done to assess the accuracy of the use of the R1 code. Screening histories were checked for the women in the cohort selected for assessment of early re-screening (that is, women with an index cytology sample taken in February or March 2006, who were aged 20-66 years at the time of their smear, and whose negative cytology result was associated with an R1 recommendation code). In approximately 98% of cases, the R1 code was consistent with the woman's individual screening history. The estimate for early re-screening changed only slightly when women for whom the R1 code may not have been appropriate were excluded from the calculations, from 29.3% to 29.0%. Patterns of early re-screening by age group also remained essentially unchanged (Fig 36). Further details of this analysis are provided in Appendix G. Further verification is underway. Note that coding errors do not impact on informing women of correct recall, as the register has

	the capability of auto-correcting for recall letters based on the current cytology result and previous screening history.

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

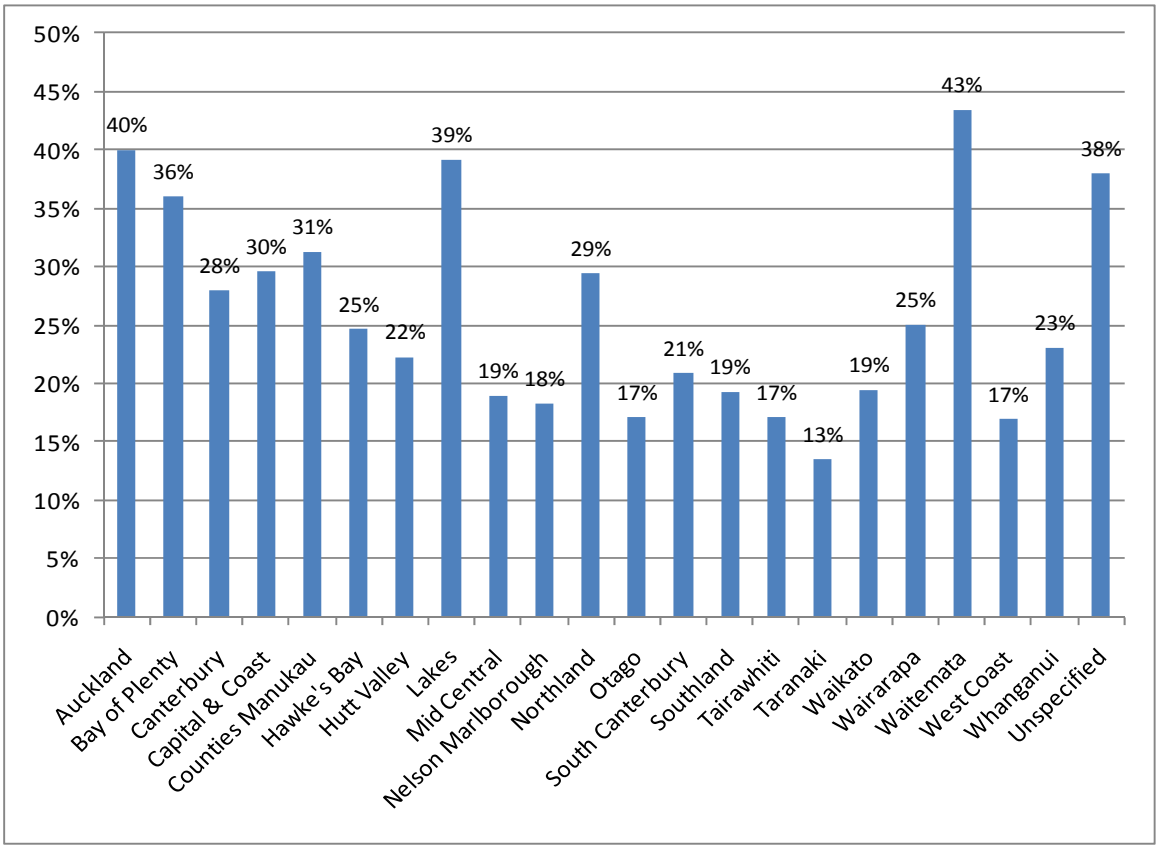
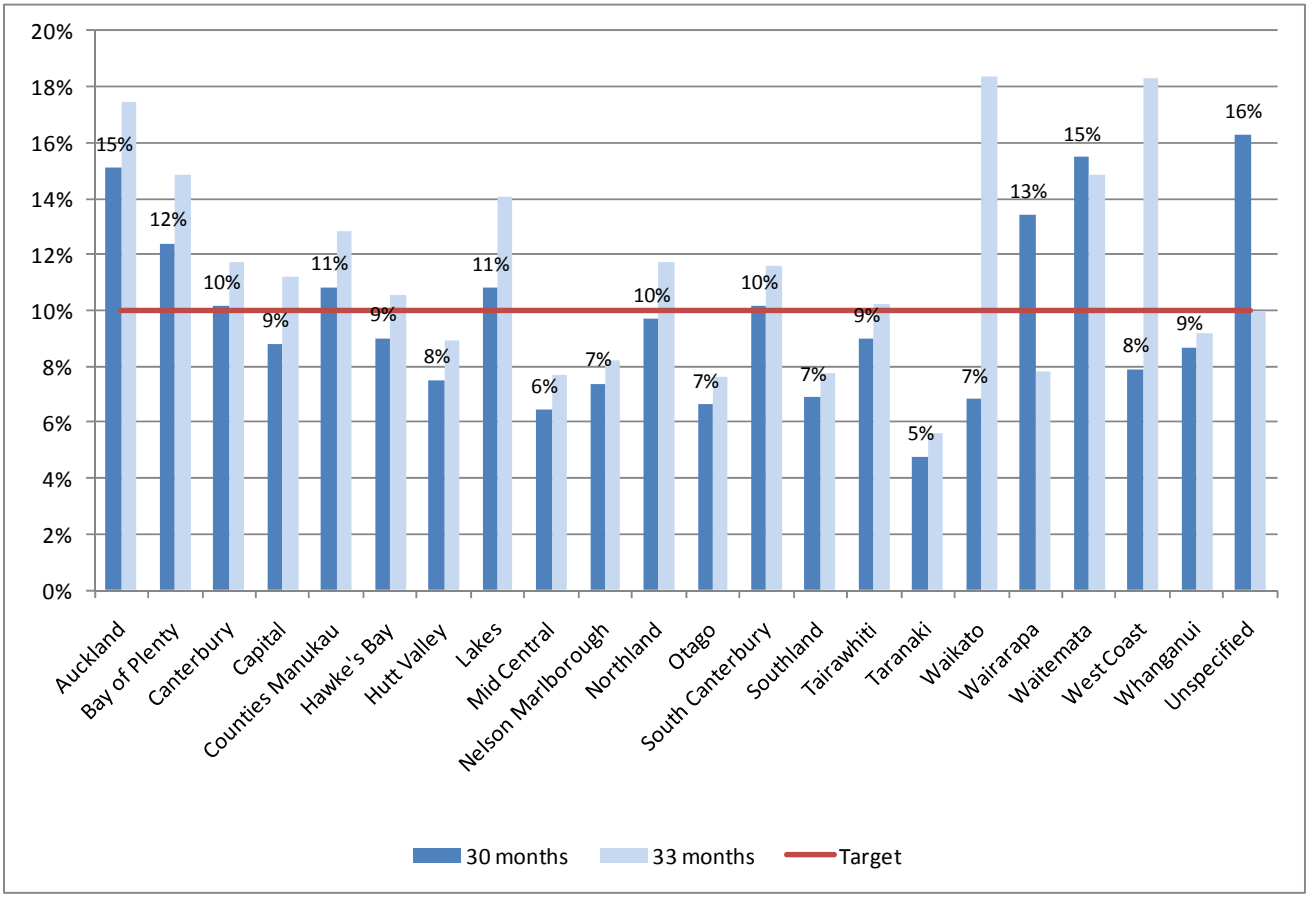


Figure 17 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by DHB (older "interval based" method)



Target: Should not exceed 10% of women screened

Figure 18 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by five year age group (cohort method)

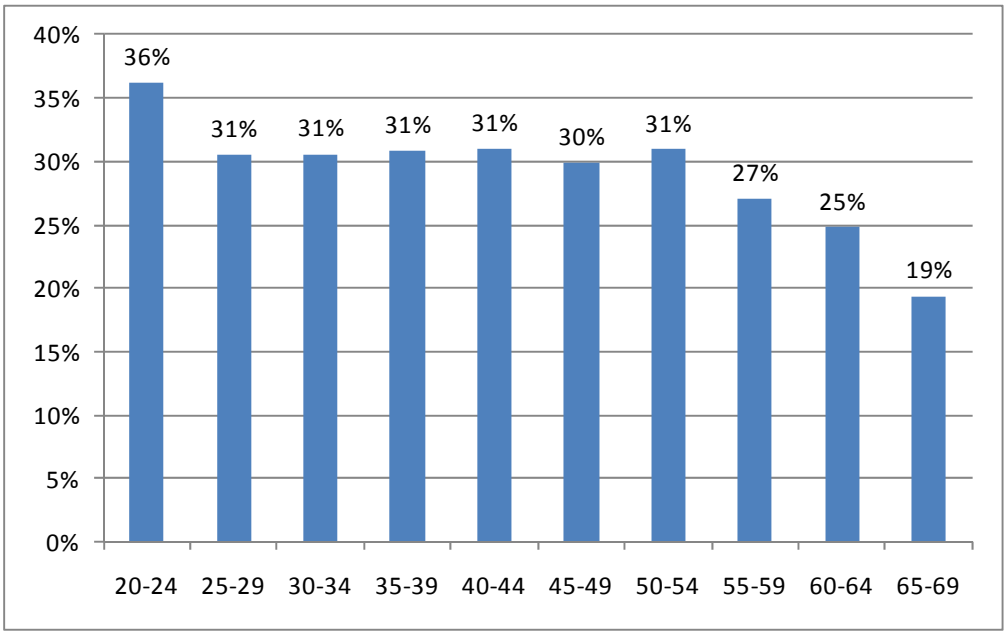
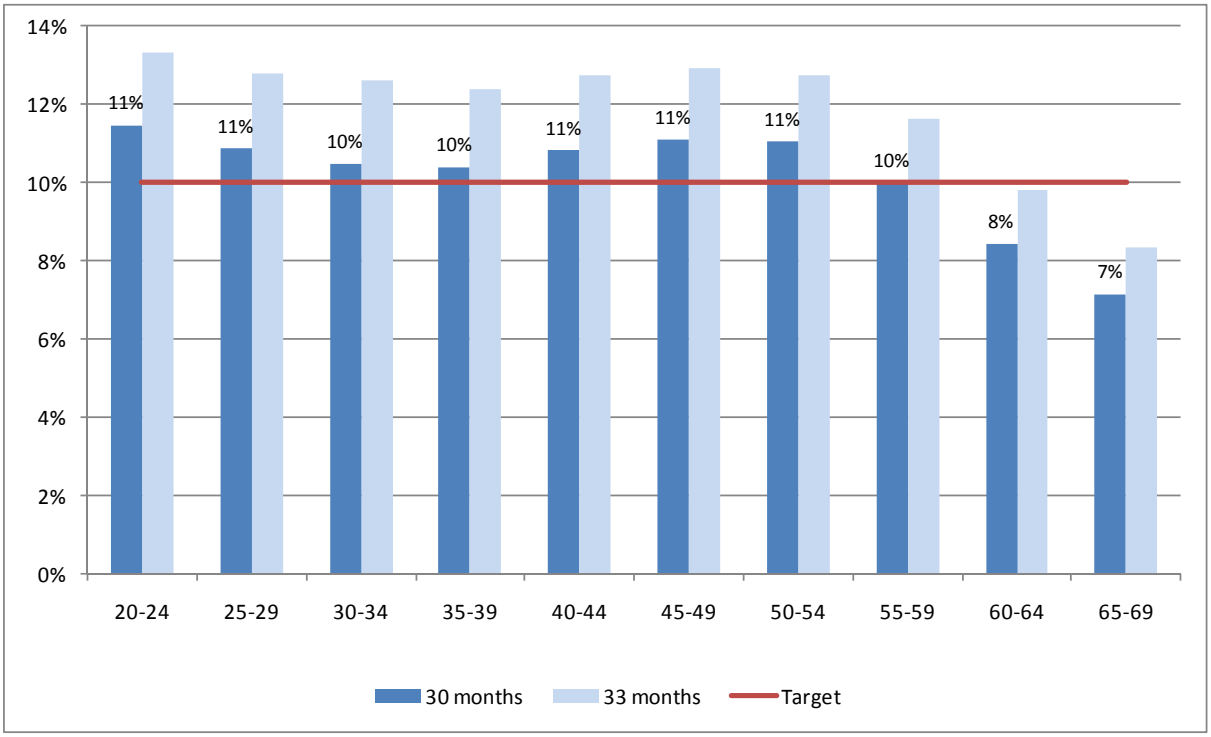


Figure 19 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by five year age group (older "interval based" method)



Target: Should not exceed 10% of women screened

Figure 20 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity (cohort method)

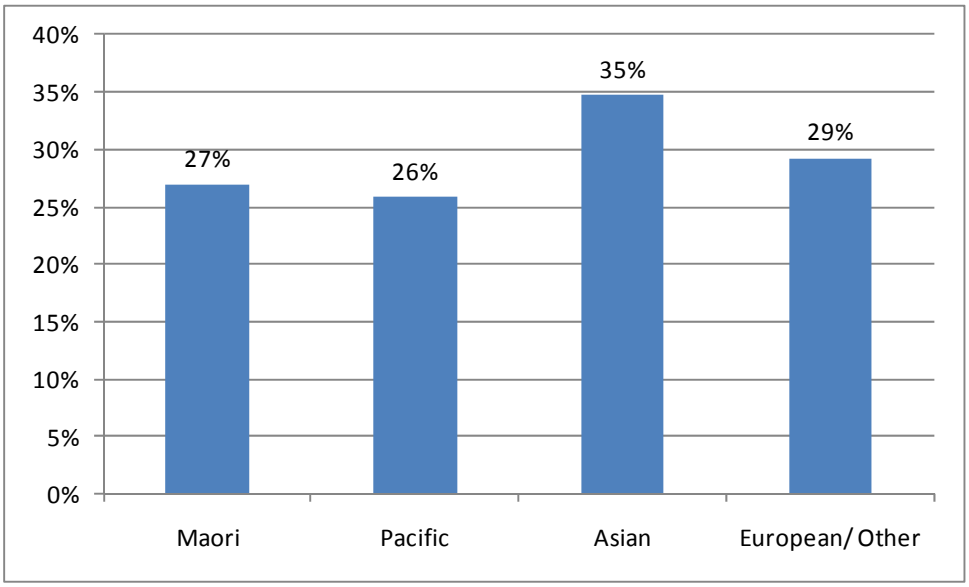
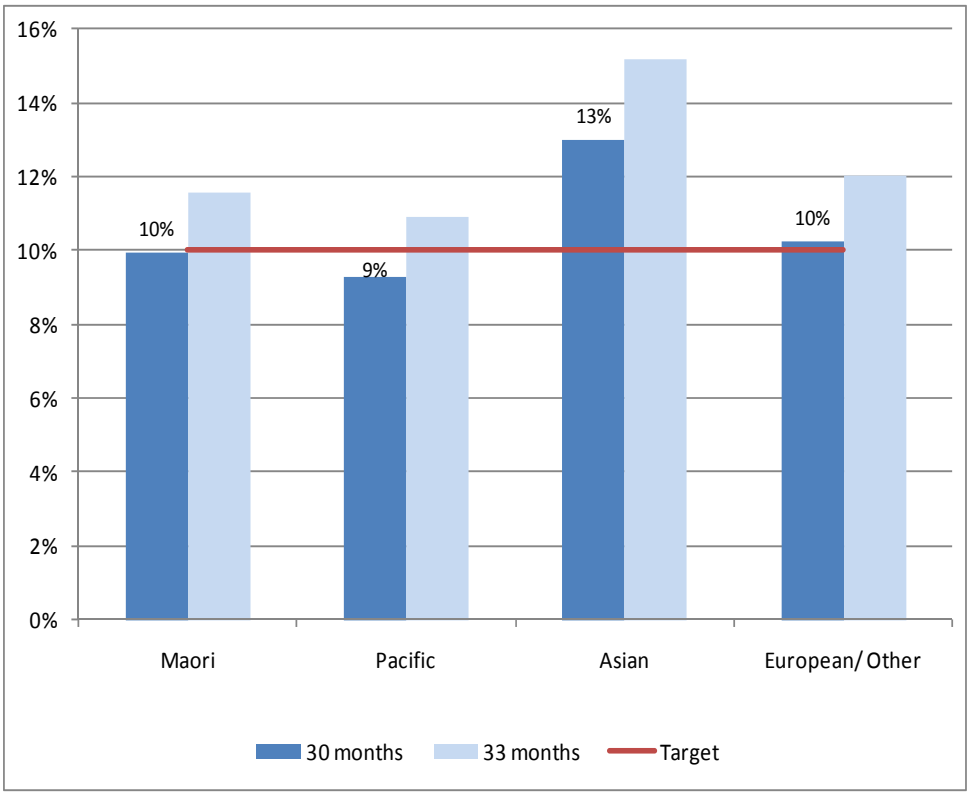


Figure 21 - Proportion of women recommended to return at the routine interval (three years) who were re-screened early, by ethnicity (older "interval based" method)



Target: Should not exceed 10% of women screened

Indicator 5 – Laboratory indicators

The indicators include cytology, histology reports (encompassing cytology and histology reporting rates, positive predictive value of cytology predicting HSIL), laboratory turnaround times, the accuracy of negative cytology reports (future development), and unsatisfactory samples. 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.
Targets	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 220,330 cytology samples were taken, 34.9% of which were liquid-based cytology (LBC), 64.1% were conventional cytology, and 1.0% were a combination

of the two (Table 6). The kinds of cytology processed (conventional vs LBC) varied widely by laboratory. The proportion of cytology samples that were LBC varied from 3.2% (Medlab Central Ltd) to 97.9% (Canterbury Health Laboratories), and the proportion that were conventional cytology varied from 1.4% (Canterbury Health Laboratories) to 96.6% (Medlab Central Ltd). All laboratories had a comparatively small proportion of combined conventional and LBC samples (maximum 2.4% at Auckland LabPLUS) (Table 6).

Unsatisfactory cytology

6,442 cytology samples (2.9% of those taken during the reporting period) were unsatisfactory. These are reported on in more detail in Table 7 and Table 9. The remaining satisfactory cytology samples are reported on in more detail in Table 8, and Table 10 to Table 13.

Unsatisfactory rates varied by cytology type, but this was not consistent for all laboratories (Table 9). Overall, combined samples had the lowest unsatisfactory rate (1.8%), and conventional cytology the highest (3.4%). The unsatisfactory rate was lowest in Southern Community Labs Christchurch (0.6%) and highest in Diagnostic Medlab Ltd (4.9%). LBC samples were associated with lower unsatisfactory rates in all laboratories except Auckland LabPLUS (conventional cytology 2.9% unsatisfactory, LBC 3.9% unsatisfactory), and Medlab Central Ltd (conventional cytology 1.8% unsatisfactory, LBC 4.0% unsatisfactory), however LBC samples form a much lower proportion of the slides analysed at Medlab Central Ltd (3.2%, compared to 34.9% nationally). Three laboratories had unsatisfactory rates outside the target range (Canterbury Health Laboratories, Southern Community Labs Christchurch, and Southern Community Labs Dunedin)(Figure 22 and Figure 23). In all cases this was due to having less than 1% unsatisfactory (Canterbury Health Laboratories 0.8% for LBC, Southern Community Labs Dunedin 0.7% for LBC, and Southern Community Labs Christchurch 0.3% for LBC and 0.7% for conventional cytology). No lab exceeded the upper targets for unsatisfactory cytology (5% for LBC, 8% for conventional cytology)(Figure 22, Figure 23).

Negative cytology reports

91.9% of cytology results were negative, consistent with the target of no more than 96% (Table 8). The proportion of samples which were negative varied by lab from 83.0% (Auckland LabPLUS) to 94.6% (Southern Community Labs Christchurch), but all laboratories met the target (Figure 24).

Abnormal cytology reports

The proportion of cytology samples which were abnormal (8.1%) also fell within the recommended range of no more than 10% (Figure 25, Table 8). This varied widely by laboratory however, from 5.4% (Southern Community Labs Christchurch) to 17.0% (Auckland LabPLUS). Two laboratories exceeded the target, although in one case very slightly (Auckland LabPLUS 17.0%, Pathlab 10.3%). Abnormal cytology results were most common in younger women (Table 12, Table 13).

HSIL cytology reports

Overall, 0.80% of cytology samples were HSIL, consistent with the target of at least 0.6% of cytology (Figure 26, Table 11). Rates varied by laboratory from 0.3% (Aotea Pathology Ltd) to 2.2% (Auckland LabPLUS). Two laboratories had rates of HSIL below target levels (Aotea Pathology Ltd, Diagnostic Medlab Ltd). Two other laboratories had rates of HSIL of just on the target level of 0.6% (Medlab South Christchurch, Southern Community Labs - Christchurch) (Figure 26). HSIL cytology results were most common in younger women (Table 12, Table 13).

Trends

The unsatisfactory rate in conventional cytology samples has decreased slightly, from 3.7% in the previous reporting, to 3.4% in the current reporting period. The unsatisfactory rate in LBC samples has also decreased slightly, from 2.4% in the previous reporting, to 2.1% in the current reporting period.

Overall abnormalities have increased slightly since the previous reporting period from 7.6% to 8.1%, and correspondingly the proportion of samples reported as negative for dysplasia or malignancy has decreased slightly from 92.4% to 91.9%. The proportion of samples reported as HSIL has remained steady at 0.8%.

The laboratories meeting targets has remained consistent since the previous reporting period. The exceptions are that the overall abnormality rate has risen in Pathlab from 7.5% the previous period to 10.3% during this period (slightly above the target), and that the unsatisfactory rate for LBC cytology in Southern Community Laboratories – Dunedin fell from 1.8% to 0.7%.

Comments

High rates of abnormal samples from Auckland LabPLUS are consistent with previous reports. It is most likely that the case-mix of this laboratory represents a higher proportion of samples received from colposcopy clinics compared to other laboratories, and this is one of the factors underlying the observed higher rate for this laboratory.

Both Aotea Pathology Ltd and Diagnostic Medlab Ltd have below target rates for HSIL, and this is also consistent with previous reports.

Although the numbers are relatively small the relative rates of invasive cancer categories between squamous (16 cases, 0.01%) and glandular (43 cases, 0.02%) interpreted cytologically (not histologically confirmed) is of note. This may in part be due to the effectiveness of the Programme in reducing invasive squamous lesions by good detection of high grade precursor lesions. However, a true increase in glandular lesions cannot be excluded as a co-factor. The majority (41 of 43) invasive glandular lesions occurred in the 50-70+ age group. The PPV of cytology for all glandular abnormalities was 43.3%.

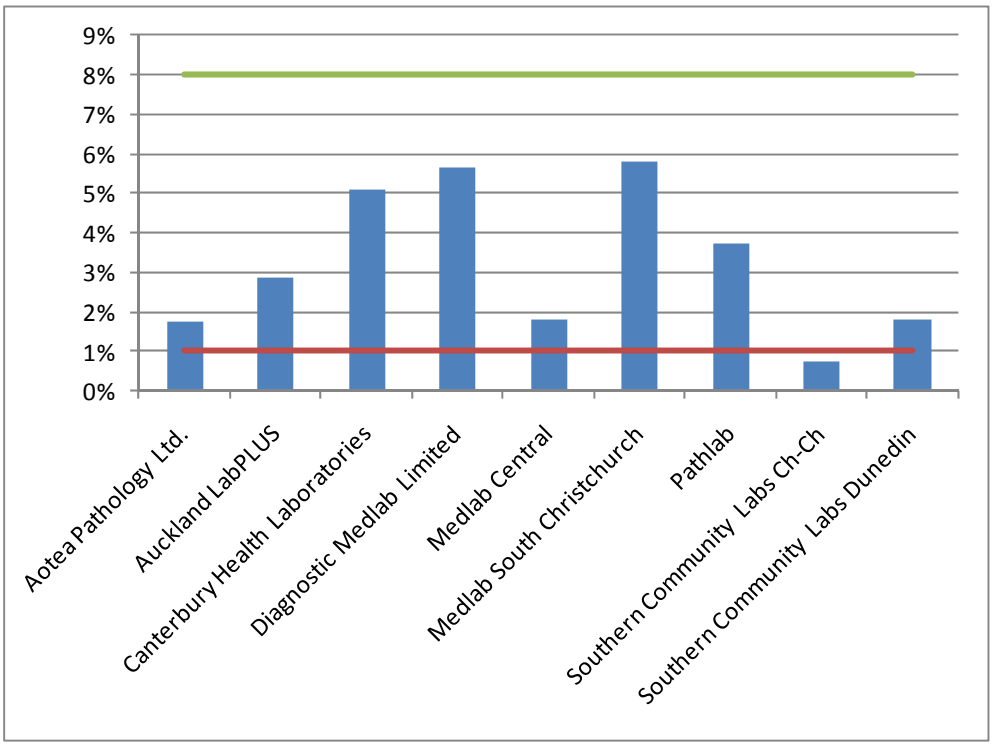
The national workload is approximately 1:2 LBC:CPS, demonstrating a steady increase towards LBC from previous reports. Breakdown of the overall unsatisfactory rate of 2.9% for all samples shows a lower rate of 2.1% for LBC compared to 3.4% for CPS but with variation between individual laboratories.

At present, there are targets for unsatisfactory cytology common to both types

of LBC (ThinPrep and SurePath). It is uncertain if this is appropriate, 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 - and 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. The target for unsatisfactory LBC samples will be reviewed as more evidence becomes available twelve months post adoption of 100% LBC policy for the Programme.

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

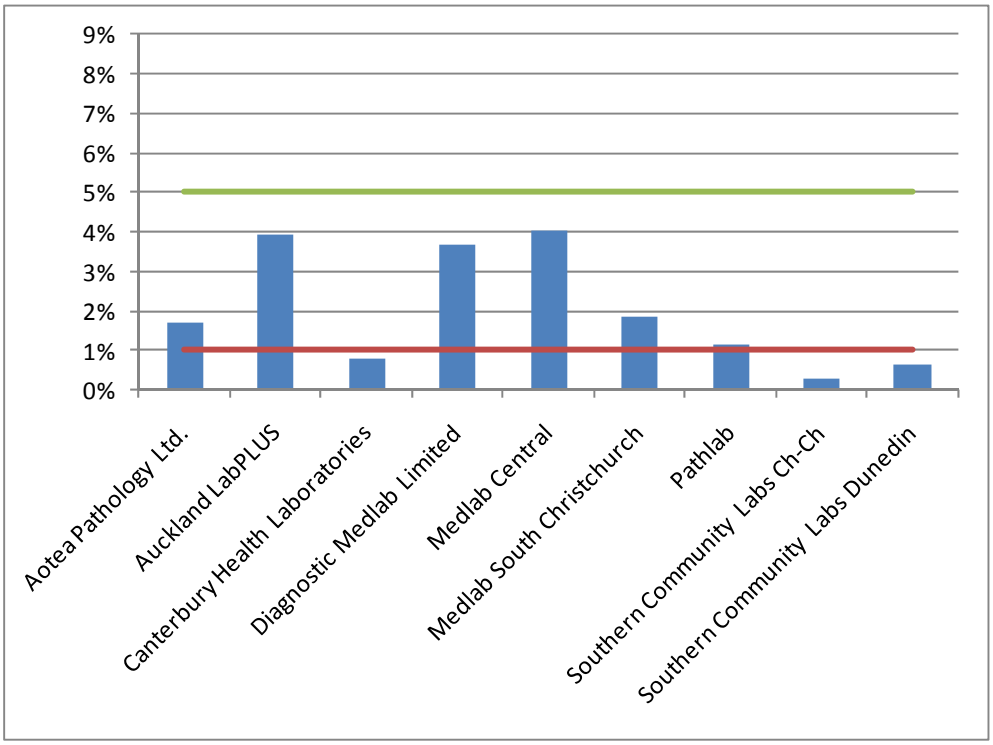
Figure 22 - Proportion of total conventional cytology samples reported as unsatisfactory by laboratory, 1 July - 31 December 2008 (Green line=upper target limit; red line=lower target limit)



Target for conventional cytology: 1-8%

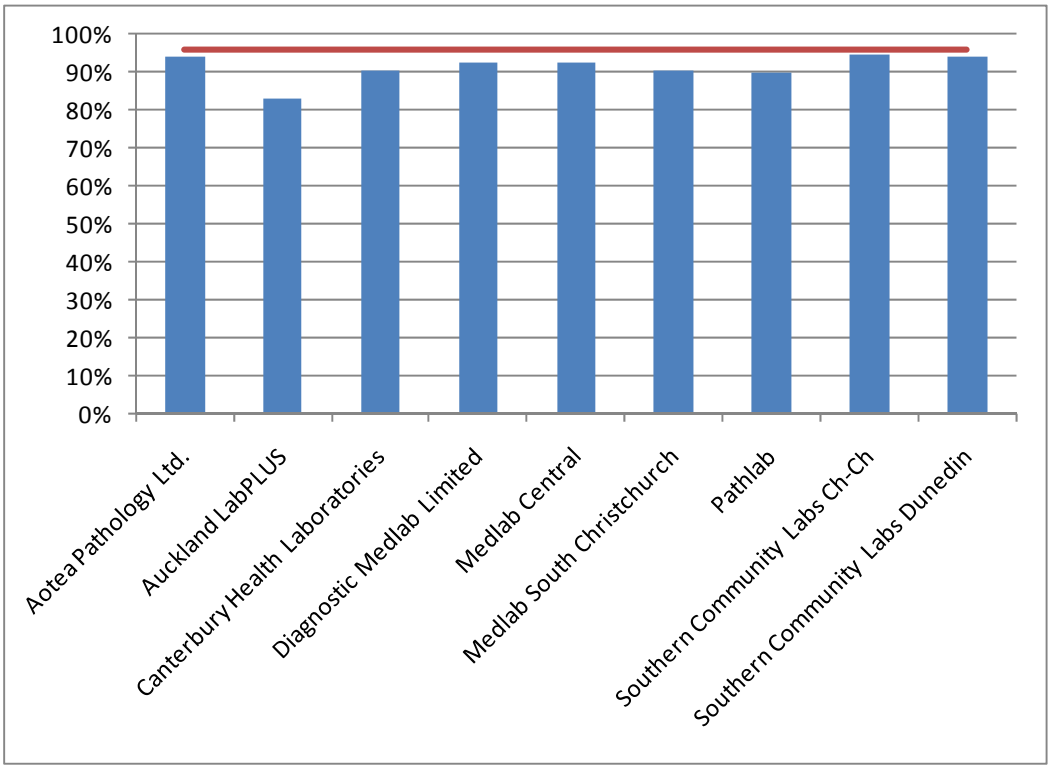
[4] Krahn, M., McLachlin M., *et al*. 2008. *Liquid-based techniques for cervical cancer screening: systematic review and cost-effectiveness analysis*. Technology report number 103. Ottawa: Canadian Agency for Drugs and Technologies in Health.

Figure 23 - Proportion of total LBC samples reported as unsatisfactory by laboratory, 1 July - 31 December 2008 (Green line=upper target limit; red line=lower target limit)



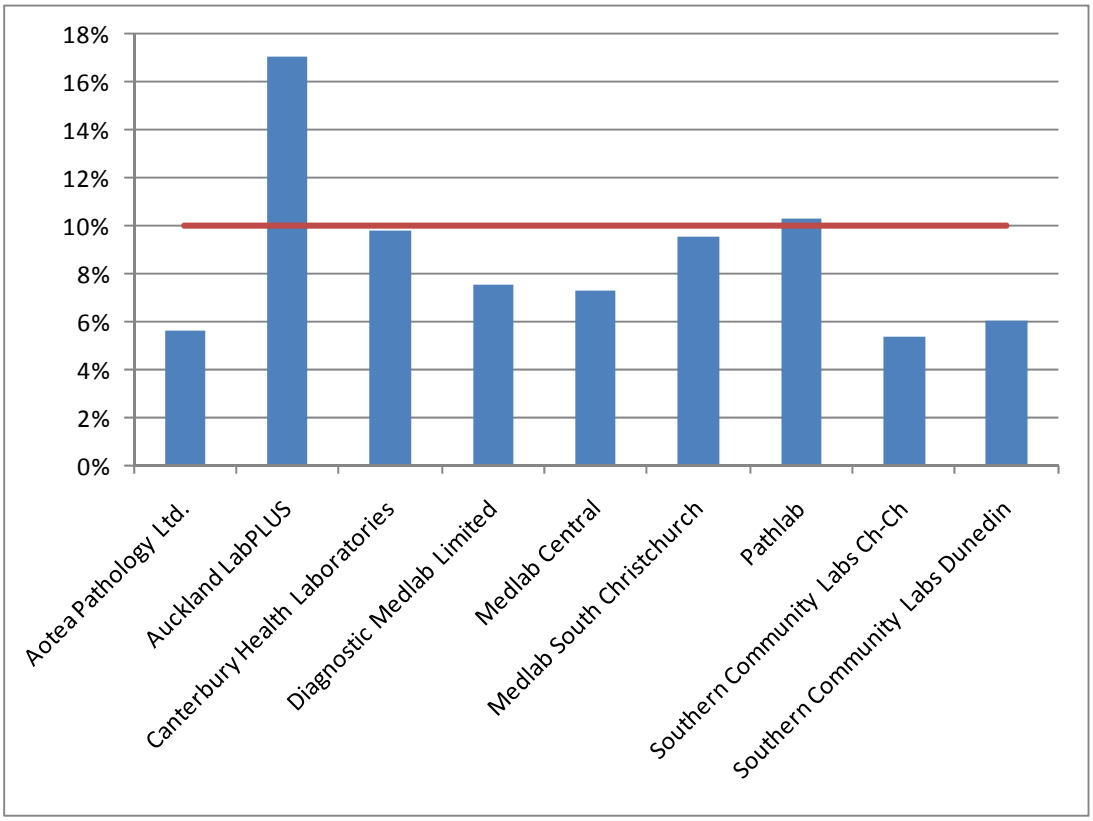
Target for LBC: 1-5%

Figure 24 - Proportion of total satisfactory samples reported as negative by laboratory, 1 July - 31 December 2008 (red line=target)



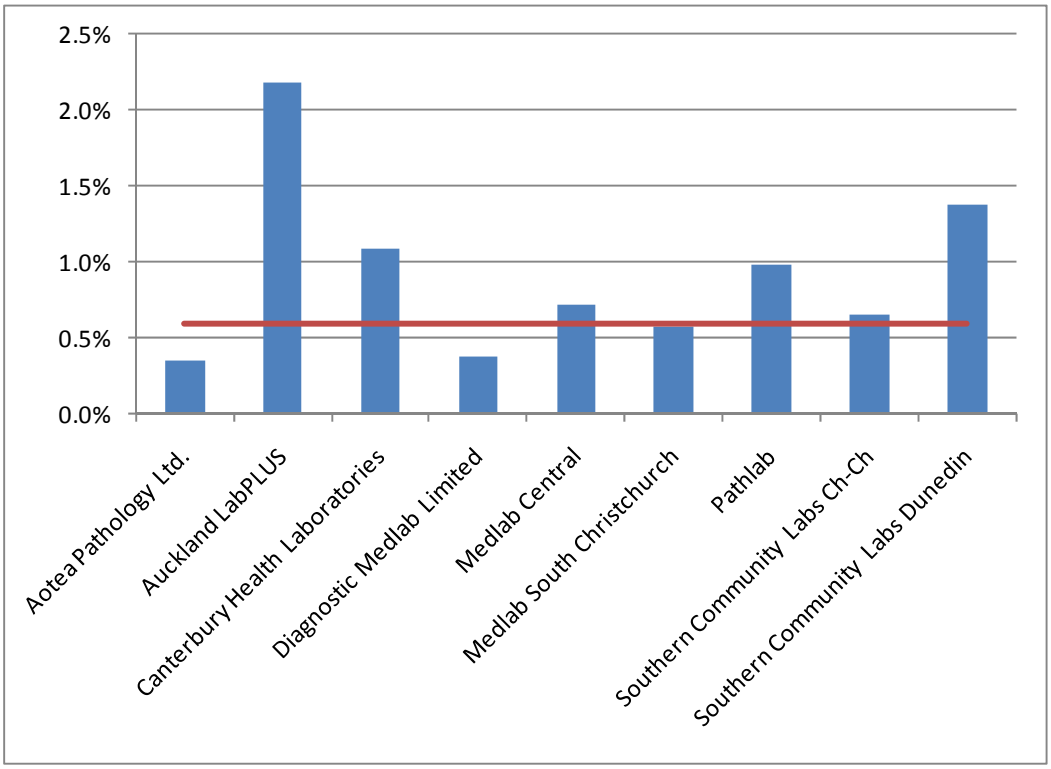
Note: Line shows negative target ≥ 96%

Figure 25 - Proportion of total satisfactory samples reported as abnormalities by laboratory, 1 July - 31 December 2008 (red line=target)



Note: Line shows abnormal target ≤ 10%

Figure 26 - Proportion of samples reported as HSIL for each laboratory, 1 July - 31 December 2008 (red line=target)



Note: Line shows HSIL target ≥ 0.6%

Table 6 - Laboratory cytology reporting by type of cytology sample (1 July - 31 December 2008)

Laboratory	All smears	By cytology sample type					
		LBC		Conventional		Combined	
	N	N	%	N	%	N	%
Aotea Pathology Ltd	22,167	3,538	16.0	18,504	83.5	125	0.6
Auckland LabPLUS	12,102	1,965	16.2	9,845	81.4	292	2.4
Canterbury Health Laboratories	20,038	19,608	97.9	275	1.4	155	0.8
Diagnostic Medlab Ltd	74,108	28,561	38.5	44,775	60.4	772	1.0
Medlab Central Ltd	16,407	521	3.2	15,852	96.6	34	0.2
Medlab South Christchurch	10,170	4,528	44.5	5,614	55.2	28	0.3
Pathlab	21,719	6,502	29.9	15,095	69.5	122	0.6
Southern Community Labs Ch-Ch	11,038	4,191	38.0	6,664	60.4	183	1.7
Southern Community Labs Dunedin	32,581	7,538	23.1	24,622	75.6	421	1.3
TOTAL	**220,330**	**76,952**	**34.9**	**141,246**	**64.1**	**2,132**	**1.0**

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 July - 31 December 2008)

Laboratory	All Smears N	Satisfactory N	Satisfactory %	Unsatisfactory N	Unsatisfactory %
Aotea Pathology Ltd	22,167	21,780	98.3	387	1.7
Auckland LabPLUS	12,102	11,735	97.0	367	3.0
Canterbury Health Laboratories	20,038	19,868	99.2	170	0.8
Diagnostic Medlab Ltd	74,108	70,510	95.1	3,598	4.9
Medlab Central Ltd	16,407	16,101	98.1	306	1.9
Medlab South Christchurch	10,170	9,758	95.9	412	4.1
Pathlab	21,719	21,079	97.1	640	2.9
Southern Community Labs Ch-Ch	11,038	10,976	99.4	62	0.6
Southern Community Labs Dunedin	32,581	32,081	98.5	500	1.5
Total	**220,330**	**213,888**	**97.1**	**6,442**	**2.9**

See also Table 9

Table 8 - Laboratory cytology reporting by general result (1 July - 31 December 2008)

Laboratory	Negative		Abnormal	
	N	%	N	%
Aotea Pathology Ltd	20,546	94.3	1,234	5.7
Auckland LabPLUS	9,737	83.0	1,998	17.0
Canterbury Health Laboratories	17,927	90.2	1,941	9.8
Diagnostic Medlab Ltd	65,183	92.4	5,327	7.6
Medlab Central Ltd	14,925	92.7	1,176	7.3
Medlab South Christchurch	8,825	90.4	933	9.6
Pathlab	18,903	89.7	2,176	10.3
Southern Community Labs Ch-Ch	10,385	94.6	591	5.4
Southern Community Labs Dunedin	30,145	94.0	1,936	6.0
Total	**196,576**	**91.9**	**17,312**	**8.1**

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

Table 9 - Laboratory reporting of unsatisfactory results by type of cytology sample (1 July - 31 December 2008)

Laboratory	Conventional			LBC			Combined			TOTAL		
	Unsat	Total	%	Unsat	Total	%	Unsat	Total	%	Unsat	Total	%
Aotea Pathology Ltd	327	18,504	1.8	60	3,538	1.7	-	125	0.0	387	22,167	1.7
Auckland LabPLUS	283	9,845	2.9	77	1,965	3.9	7	292	2.4	367	12,102	3.0
Canterbury Health Laboratories	14	275	5.1	155	19,608	0.8	1	155	0.6	170	20,038	0.8
Diagnostic Medlab Ltd	2,528	44,775	5.6	1,056	28,561	3.7	14	772	1.8	3,598	74,108	4.9
Medlab Central Ltd	282	15,852	1.8	21	521	4.0	3	34	8.8	306	16,407	1.9
Medlab South Christchurch	327	5,614	5.8	85	4,528	1.9	-	28	0.0	412	10,170	4.1
Pathlab	562	15,095	3.7	73	6,502	1.1	5	122	4.1	640	21,719	2.9
Southern Community Labs Ch-Ch	49	6,664	0.7	12	4,191	0.3	1	183	0.5	62	11,038	0.6
Southern Community Labs Dunedin	442	24,622	1.8	50	7,538	0.7	8	421	1.9	500	32,581	1.5
Total	**4,814**	**141,246**	**3.4**	**1,589**	**76,952**	**2.1**	**39**	**2,132**	**1.8**	**6,442**	**220,330**	**2.9**

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

Table 10 - Laboratory cytology reporting by cytological category (1 July - 31 December 2008) – counts

	Result									
Laboratory	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/ AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
Aotea Pathology Ltd	20,546	452	605	88	76	-	10	3	-	21,780
Auckland LabPLUS	9,737	783	581	315	256	1	55	2	5	11,735
Canterbury Health Laboratories	17,927	536	961	198	216	5	15	10	-	19,868
Diagnostic Medlab Ltd	65,183	1,972	2,549	463	269	1	64	6	3	70,510
Medlab Central Ltd	14,925	296	591	153	116	1	16	2	1	16,101
Medlab South Christchurch	8,825	435	333	95	56	2	8	4	-	9,758
Pathlab	18,903	793	921	199	206	3	47	4	3	21,079
Southern Community Labs Ch-Ch	10,385	217	266	32	71	1	3	1	-	10,976
Southern Community Labs Dunedin	30,145	259	1,078	120	441	2	25	11	-	32,081
Total	**196,576**	**5,743**	**7,885**	**1,663**	**1,707**	**16**	**243**	**43**	**12**	**213,888**

Table 11 - Laboratory cytology reporting by cytological category (1 July - 31 December 2008) - percentage of all satisfactory samples

Laboratory	Percentage of Laboratory's Result								
	Negative	ASC-US	LSIL	ASC-H	HSIL	SC	AGC/AIS	Adeno-carcinoma	Malignant Neoplasm
Aotea Pathology Ltd	94.3	2.1	2.8	0.4	0.3	-	0.05	0.01	-
Auckland LabPLUS	83.0	6.7	5.0	2.7	2.2	0.01	0.47	0.02	0.04
Canterbury Health Laboratories	90.2	2.7	4.8	1.0	1.1	0.03	0.08	0.05	-
Diagnostic Medlab Ltd	92.4	2.8	3.6	0.7	0.4	<0.005	0.09	0.01	<0.005
Medlab Central Ltd	92.7	1.8	3.7	1.0	0.7	0.01	0.10	0.01	0.01
Medlab South Christchurch	90.4	4.5	3.4	1.0	0.6	0.02	0.08	0.04	-
Pathlab	89.7	3.8	4.4	0.9	1.0	0.01	0.22	0.02	0.01
Southern Community Labs Ch-Ch	94.6	2.0	2.4	0.3	0.6	0.01	0.03	0.01	-
Southern Community Labs Dunedin	94.0	0.8	3.4	0.4	1.4	0.01	0.08	0.03	-
Total	**91.9**	**2.7**	**3.7**	**0.8**	**0.8**	**0.01**	**0.11**	**0.02**	**0.01**

Note: Target: HSIL ≥ 0.6% reported as HSIL

Table 12 - Laboratory reporting of cytological category by five year age group (1 July - 31 December 2008) – counts

	Cytology Result									
Age Group	**Negative**	**ASC-US**	**LSIL**	**ASC-H**	**HSIL**	**SC**	**AGC/AIS**	**Adeno-carcinoma**	**Malignant Neoplasm**	**Total**
<20	2,764	187	508	63	47	-	1	-	-	**3,570**
20-24	20,420	1,105	2,617	434	399	-	14	-	-	**24,989**
25-29	19,385	746	1,368	295	371	-	16	-	-	**22,181**
30-34	21,554	653	894	213	262	-	28	1	-	**23,605**
35-39	25,762	713	747	168	230	1	29	-	1	**27,651**
40-44	25,350	711	626	147	157	1	22	1	2	**27,017**
45-49	24,615	665	495	124	111	-	33	-	-	**26,043**
50-54	19,557	441	277	87	61	4	31	6	-	**20,464**
55-59	15,448	262	163	64	26	1	13	8	2	**15,987**
60-64	11,897	144	103	44	19	5	17	7	-	**12,236**
65-69	7,857	96	58	16	17	-	15	6	3	**8,068**
70+	1,967	20	29	8	7	4	24	14	4	**2,077**
Total	**196,576**	**5,743**	**7,885**	**1,663**	**1,707**	**16**	**243**	**43**	**12**	**213,888**

Table 13 - Laboratory reporting of cytological category by five year age group (1 July - 31 December 2008) - 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	77.4	5.2	14.2	1.8	1.3	-	0.03	-	-
20-24	81.7	4.4	10.5	1.7	1.6	-	0.06	-	-
25-29	87.4	3.4	6.2	1.3	1.7	-	0.07	-	-
30-34	91.3	2.8	3.8	0.9	1.1	-	0.12	<0.005	-
35-39	93.2	2.6	2.7	0.6	0.8	<0.005	0.10	-	<0.005
40-44	93.8	2.6	2.3	0.5	0.6	<0.005	0.08	<0.005	<0.005
45-49	94.5	2.6	1.9	0.5	0.4	-	0.13	-	-
50-54	95.6	2.2	1.4	0.4	0.3	0.02	0.15	0.03	-
55-59	96.6	1.6	1.0	0.4	0.2	0.01	0.08	0.05	0.01
60-64	97.2	1.2	0.8	0.4	0.2	0.04	0.14	0.06	-
65-69	97.4	1.2	0.7	0.2	0.2	<0.005	0.19	0.07	0.04
70+	94.7	1.0	1.4	0.4	0.3	0.19	1.16	0.67	0.19
Total	**91.9**	**2.7**	**3.7**	**0.8**	**0.8**	**0.01**	**0.11**	**0.02**	**0.01**

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 from 1 January 2008 – 30 June 2008 inclusive) were identified. Where a woman had multiple samples or a report had multiple interpretation codes, the most serious result category reported was used. If there were two test reports for a woman of the same grade, the earliest report date 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 period, the most serious abnormality category was used.

HSIL+SC

1,518 women with HSIL or SC cytology reports were identified. 152 of these women (10.0%) had no histology taken in the period from five days prior to six months after the cytology sample was taken. Among the remaining 1,366 for whom there was histology, 1,135 (83.1%) had their HSIL/SC cytology confirmed by histology (refer to Appendix C for definition of histological confirmation) (Figure 27, Table 40).

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. They were Auckland LabPLUS (90.2%), Canterbury Health Laboratories (86.5%), Medlab Central Ltd (87.1%) and Southern Community Labs Christchurch (88.2%) (Figure 27, Table 40).

Other cytological abnormalities

Similar calculations for positive predictive value were performed for women whose worst cytology report was ASC-H; glandular abnormality (AG1-AG5, AIS, AC1-AC4); or combined ASC-H, HSIL and SC. There are no targets for these measures.

ASC-H

1,433 women with a cytology report of ASC-H were identified. 328 (22.9%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 1,105 women, 517 (46.8%) were histologically confirmed as high grade. This proportion varied by laboratory,

from 35.9% (Aotea Pathology Ltd) to 54.5% (Auckland LabPLUS) (Figure 28, Table 41).

ASC-H+HSIL+SC

Therefore, a total of 2,951 women had a cytology report of ASC-H, HSIL or SC. 480 (16.3%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 2,471 women, 1,652 (66.9%) were histologically confirmed as high grade. This proportion varied by laboratory, from 51.4% (Aotea Pathology Ltd) to 75.5% (Southern Community Labs – Christchurch). The combined positive predictive value across the 2,471 women with ASC-H, HSIL, and SC and histology available is shown in Figure 28 and Table 42.

Glandular abnormalities

299 women with a glandular abnormality (AG1-AG5, AIS, AC1-AC4) were identified. 82 women (27.4%) had no histology taken in the period from five days prior to six months after the cytology sample. Among the remaining 217 women, 94 (43.3%) had their high grade histologically confirmed. The proportion confirmed by histology varied by laboratory, ranging from 34.3% (Auckland LabPLUS) to 71.4% (Aotea Pathology Ltd) (Figure 28, Table 43). Most laboratories had very few cases of glandular abnormalities, however, and fewer with histology available – three laboratories had less than 20 cases in the period, and less than 10 with histology available (o, Medlab South Christchurch, Southern Community Labs Christchurch), and one other lab had less than 30 cases, and less than 20 with histology available (Medlab Central Ltd).

Trends

Positive predictive value for HSIL and SC cytology has increased since the previous monitoring report, from 79.7% to 83.1%. Patterns by laboratory have also changed somewhat, with some laboratories increasing their PPV (Medlab Central Ltd by 12.1% and Southern Community Labs Christchurch by 6.3%), and one lab decreasing (Aotea Pathology Ltd by 4.1%).

Positive predictive value for ASC-H cytology has slightly decreased, from 47.8% to 46.8%, however there is no target for this measure. The proportion of cytology reports in each of these groups with histology available has remained very similar for HSIL or SC (90.8% in the previous report; 90.0% in the current report), and decreased slightly (from 78.8% to 77.1%) for ASC-H.

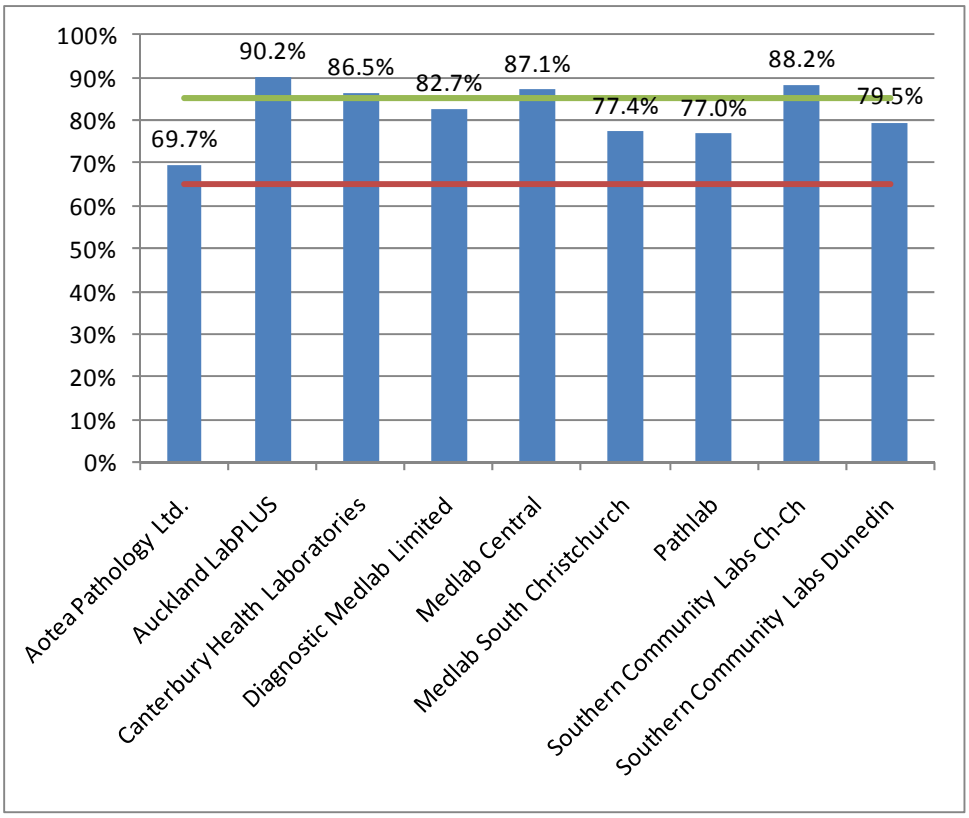
Positive predictive values for glandular abnormalities and for the combination of ASC-H, HSIL and SC have not previously been reported on. However reports for the combination of ASC-H, HSIL and SC can be computed from the previous report. The positive predictive value for the combined group increased slightly between the previous report (65.4%) and the current report (66.9%).

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 are available on the NCSP Register, it may be possible to better distinguish between these two possibilities.

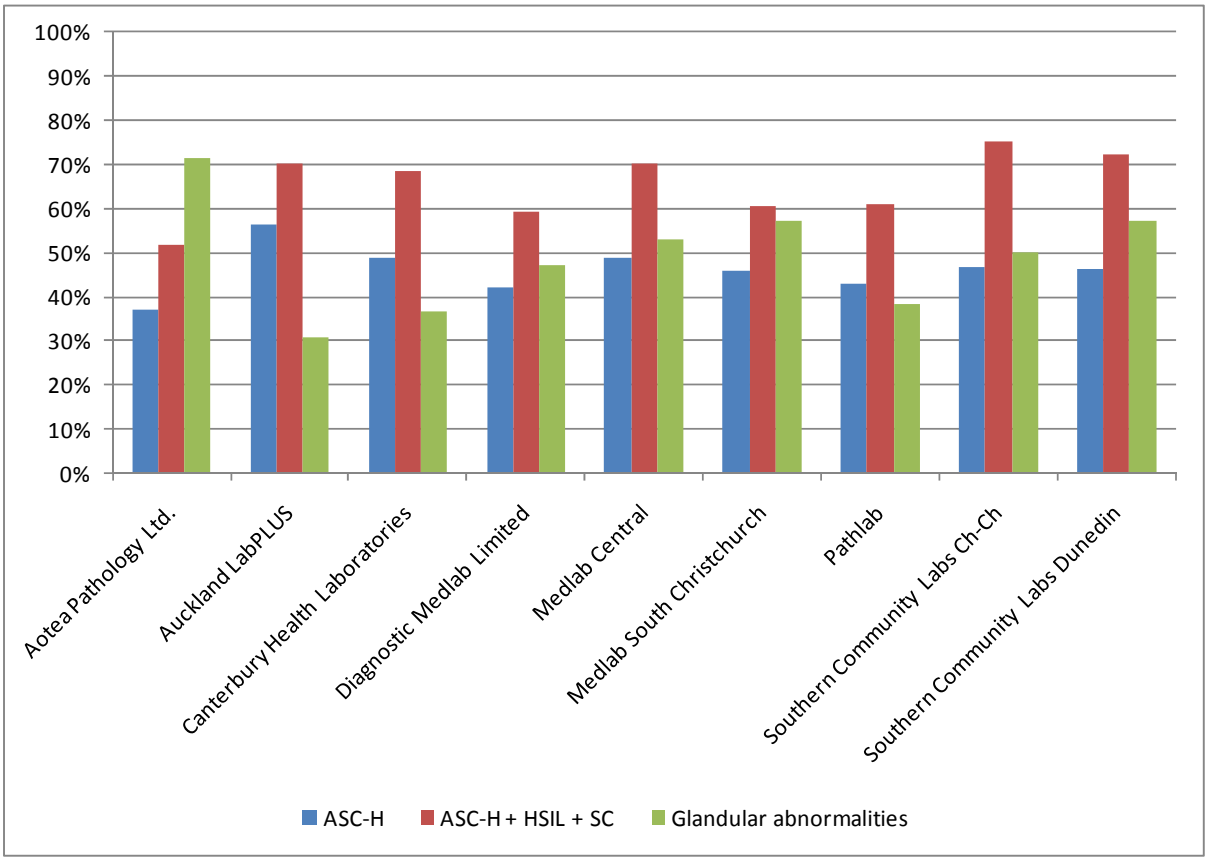
The calculations also do not discriminate between cytology taken as a screening or diagnostic test. This may be a contributing factor for some laboratories with a PPV higher than the upper end of the target range, particularly where the colposcopically-directed cytology and corresponding histology are 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 27 - Positive predictive value for CIN2+ in women with HSIL or SC cytology reports by laboratory, 1 July to 31 December 2008



Target: 65% - 85%

Figure 28 - Positive predictive value for CIN2+ in women with other high grade cytology reports, by laboratory 1 July to 31 December 2008



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 samples. 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). 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 NZ license 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	13,787 histology samples were taken during the current reporting period. 334 (2.4%) of these were unsatisfactory. The remaining 13,453 samples were taken from 11,882 women. Results for these women are reported on in detail in Table 14 - Table 17. 53% of women with histology tests had negative or benign histology results (Table 14, Table 15). 20.3% of women had HSIL histology results. 65 (0.5%) women had histology results which were invasive squamous cell carcinoma (ISCC), 5 (<0.1%) which were microinvasive SCC, 55 (0.5%) which were invasive adenocarcinoma, and 31 (0.3%) which were adenocarcinoma in situ. The age group with the largest number of women with histology samples was women aged 20-24 years (1,767 women, Table 16). This was also the age group with the lowest rate of women with results which were negative or HPV only (36.1%, Table 17).
Trends	Histology results were not reported in the previous monitoring report (Monitoring Report 29, January-June 2008). Histology results have been reported in annual reports, although categories differ compared to those used in the current report. The proportion of women with negative or benign histology is unchanged since 2007 (53%). The proportions were similar for women with HSIL (19% in 2007), ISCC (0.4%), and invasive adenocarcinoma (0.4%).

Comments	Histology samples include diagnostic biopsies, treatment biopsies, cervical polyps and the cervical tissue of total hysterectomy samples. Further work is underway to investigate the potential role of miscoding in the relatively high reported number of adenocarcinomas.

Table 14 - Histology results reporting by SNOMED category

SNOMED category	Women with that diagnosis	
	N	%
Negative/normal	2,846	24.0
Inflammation	869	7.3
Microglandular hyperplasia	22	0.2
Squamous metaplasia	608	5.1
Atypia	103	0.9
HPV	1,174	9.9
Condyloma acuminatum	3	0.03
Dysplasia/CIN NOS	88	0.7
CIN 1 (LSIL) or VAIN 1	1,628	13.7
CIN 2 (HSIL) or VAIN 2	370	3.1
CIN 3 (HSIL) or VAIN 3	724	6.1
HSIL NOS	1,317	11.1
Polyp	1,144	9.6
Other (not dysplastic or malignant)	803	6.8
Microinvasive squamous cell carcinoma	5	0.04
Invasive squamous cell carcinoma	65	0.5
Adenocarcinoma in situ	31	0.3
Invasive adenocarcinoma	55	0.5
Metastatic (non-cervical) tumour	10	0.1
Miscellaneous primary tumour	4	0.03
Other primary epithelial malignancy	8	0.1
Benign glandular atypia	4	0.03
Glandular dysplasia	1	0.01
Total	**11,882**	**100.0**

HSIL NOS = high grade squamous intraepithelial lesion, not otherwise specified/ CIN 2/3 (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)	6,296	53.0
HPV	1,177	9.9
CIN1	1,819	15.3
CIN2	370	3.1
CIN3	724	6.1
HSIL NOS	1,317	11.1
Microinvasive	5	0.04
Invasive squamous cell carcinoma	65	0.5
Glandular dysplasia	1	0.01
Adenocarcinoma in situ	31	0.3
Invasive adenocarcinoma	55	0.5
Other cancer	22	0.2
Total	**11,882**	**100.0**

HSIL NOS = high grade squamous intraepithelial lesion, 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/other non neoplastic	37	394	375	455	726	1,023	1,169	849	501	322	206	239	**6,296**
HPV	30	243	203	172	142	142	116	62	36	20	9	2	**1,177**
CIN1	48	498	349	238	206	189	136	75	45	20	11	4	**1,819**
CIN2	16	105	91	48	31	27	28	9	7	5	2	1	**370**
CIN3	11	181	162	135	96	59	33	23	9	10	4	1	**724**
HSIL	33	338	292	207	166	111	83	34	18	20	10	5	**1,317**
Microinvasive	-	1	-	-	-	1	1	-	1	-	-	1	**5**
Invasive SCC	-	1	3	8	8	10	5	8	7	3	4	8	**65**
Glandular dysplasia	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Adenocarcinoma in situ	-	4	4	4	4	3	1	3	2	4	2	-	**31**
Invasive adenocarcinoma	-	2	2	1	7	5	2	4	10	6	4	12	**55**
Other cancer	-	-	-	1	1	1	1	2	3	3	6	4	**22**
Total	**175**	**1,767**	**1,482**	**1,269**	**1,387**	**1,571**	**1,575**	**1,069**	**639**	**413**	**258**	**277**	**11,882**

Table 17 - Histology results by age – percentages

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/other non neoplastic	21.1	22.3	25.3	35.9	52.3	65.1	74.2	79.4	78.4	78.0	79.8	86.3
HPV	17.1	13.8	13.7	13.6	10.2	9.0	7.4	5.8	5.6	4.8	3.5	0.7
CIN1	27.4	28.2	23.6	18.8	14.9	12.0	8.6	7.0	7.0	4.8	4.3	1.4
CIN2	9.1	5.9	6.1	3.8	2.2	1.7	1.8	0.8	1.1	1.2	0.8	0.4
CIN3	6.3	10.2	10.9	10.6	6.9	3.8	2.1	2.2	1.4	2.4	1.6	0.4
HSIL	18.9	19.1	19.7	16.3	12.0	7.1	5.3	3.2	2.8	4.8	3.9	1.8
Microinvasive	-	0.1	-	-	-	0.1	0.1	-	0.2	-	-	0.4
Invasive SCC	-	0.1	0.2	0.6	0.6	0.6	0.3	0.8	1.1	0.7	1.6	2.9
Glandular dysplasia	-	-	0.1	-	-	-	-	-	-	-	-	-
Adenocarcinoma in situ	-	0.2	0.3	0.3	0.3	0.2	0.1	0.3	0.3	1.0	0.8	-
Invasive adenocarcinoma	-	0.1	0.1	0.1	0.5	0.3	0.1	0.4	1.6	1.5	1.6	4.3
Other cancer	-	-	-	0.1	0.1	0.1	0.1	0.2	0.5	0.7	2.3	1.4
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, and 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 (refer to Comments section for further details).

Target

Cytology

Laboratories are required to report 90% of final gynaecological cytology results to sample takers within seven working days of receipt of the sample and 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[3]).

Current Situation

Cytology

Nine laboratories received 220,743 cytology samples during the current reporting period. Overall, 86.0% of cytology samples were reported on within seven working days, and 96.7% were reported on within 15 working days. These values are slightly below the targets (Table 44).

Five laboratories met the target for 90% of cytology samples to be reported to smear takers in seven days or less (Aotea Pathology Ltd, Diagnostic Medlab Ltd, Medlab Central Ltd, Medlab South Christchurch, Pathlab), and four met the target of 100% within 15 working days (Aotea Pathology Ltd, Medlab Central Ltd, Medlab South Christchurch, Pathlab) (Figure 16, Figure 17, Table 44). Of the remaining five laboratories, three had reported on over 99% of cytology samples within 15 days (Diagnostic Medlab Ltd, Southern Community Labs – Christchurch and Southern Community Labs - Dunedin), and only one laboratory had reported on less than 95% within 15 working days (Canterbury Health Laboratories, 67.6%).

Histology

21 laboratories received 13,750 histology samples in the current reporting period. Overall 87.9% of samples were reported on within five working days, and 98.7% were reported on in 15 working days or less. These values are slightly below the targets (Table 45).

12 laboratories met the target of 90% of final histology results to referring

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

colposcopists within five working days of receipt of the sample (Diagnostic Medlab Ltd, Pathlab, Medlab Central Ltd, Medlab South Christchurch, Medlab Timaru, Memorial Hospital Hastings Lab, Middlemore Hospital Laboratory, North Shore Hospital Laboratory, Northland Pathology Laboratory, Rotorua Hospital Laboratory, Southern Community Labs Dunedin, Taranaki Medlab) (Figure 18, Table 45). 13 laboratories met the target of 99% of final histology results within 15 working days of receiving the sample, and of the remaining eight, six had reported on at least 95% of samples within 15 days. The remaining two laboratories had reported on 93.6% (Waikato Hospital Laboratory), and 84.5% (Southern Community Labs Christchurch, 85%)(Figure 19, Table 45).

Trends

Cytology

Both the overall proportion number of samples reported on within seven working days, and number of laboratories meeting the cytology turnaround time targets increased during this period compared to 2007. In 2007, 81.1% of cytology samples were reported on within seven working days (compared to 86.0% during this reporting period), and three of the nine laboratories met the seven working day target of 90% (compared to five of the nine in this period).

Histology

Overall, the proportion of histology samples reported on within five working days is slightly lower than it was in 2007 (87.9% during this period compared to 90.9% in 2007). One fewer laboratories met this target than in 2007, but as one fewer laboratories reported on histology, the proportion of laboratories meeting the target remained similar (12/21 during this period, compared to 13/22 in 2007).

Comments

Targets for cytology and histology turnaround times have changed from 100% within 14 working days in 2007, to 100% within 15 working days for this reporting period. As a result, this target is not comparable between the two reports.

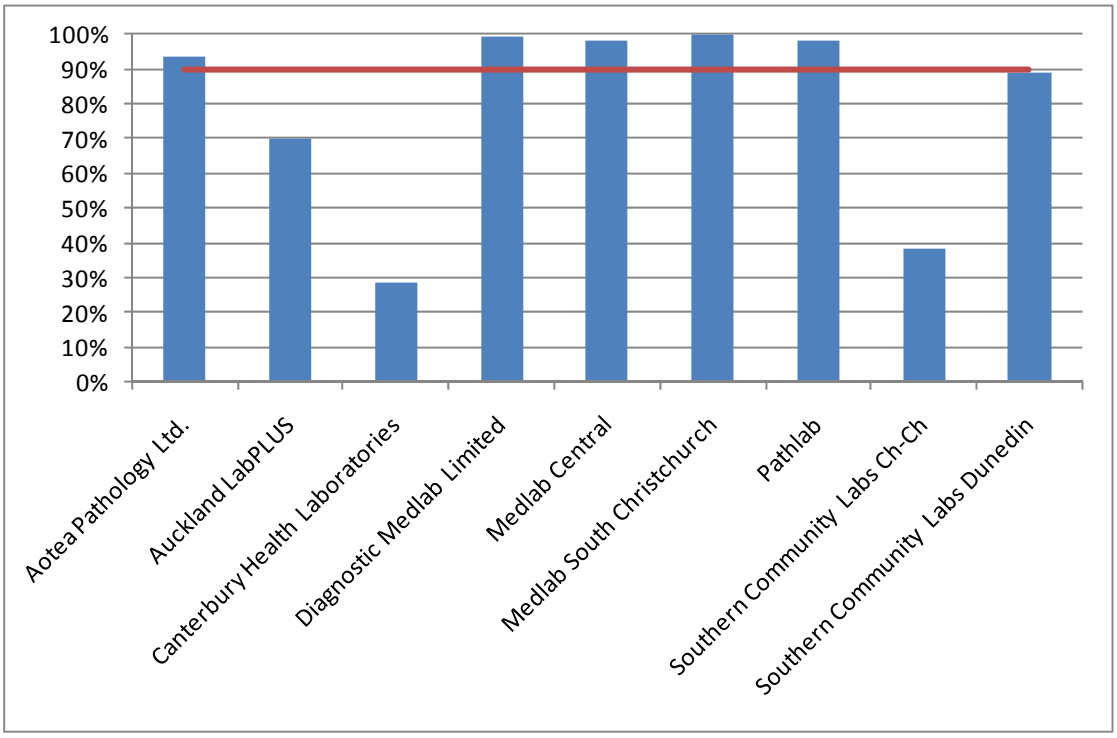
Note that the total number of cytology samples reported on in this Indicator is different from that reported in Indicator 5.1 (220,333), as the inclusion criteria for the current indicator is all cytology received by laboratories within the reporting period, rather than cytology taken during the reporting period which was the criteria for Indicator 5.1.

The extended cytology turnaround times for Canterbury Health Laboratories were investigated by the NSU at the time and identified by Canterbury Health Laboratories as a dramatic increase in LBC samples causing a workforce issue. Canterbury Health Laboratories monitored and reported on a weekly basis to the National Screening Unit until the turnaround times were back within the target. Smear takers were informed of the issue.

The definition used for turnaround time differs between laboratories. For example a turnaround time of one day can mean within 24 hours, on the same day the sample is received, or on the day after the sample is received, therefore it has not been possible to use a definition here which is consistent with what all laboratories use.

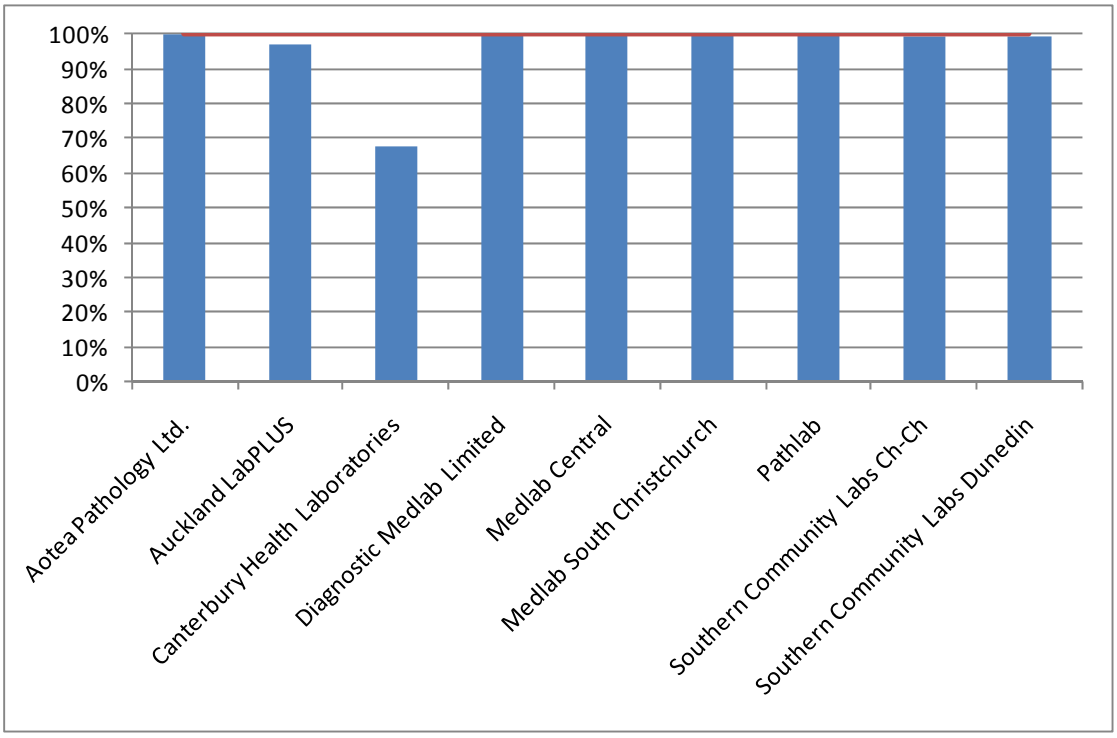
The calculations currently include public holidays as working days.

Figure 29 - Proportion of cytology results reported within seven working days by laboratory, 1 July to 31 December 2008



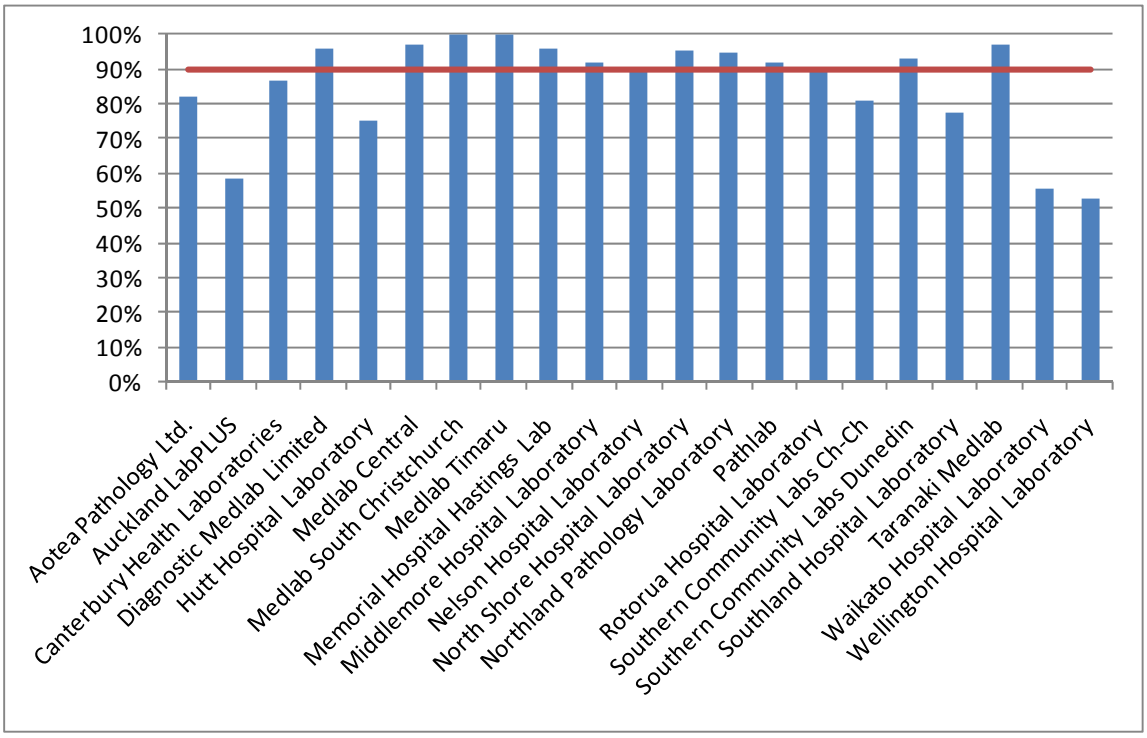
Target: 90 % within seven working days (red line)

Figure 30 - Proportion of cytology results reported within 15 working days by laboratory, 1 July to 31 December 2008



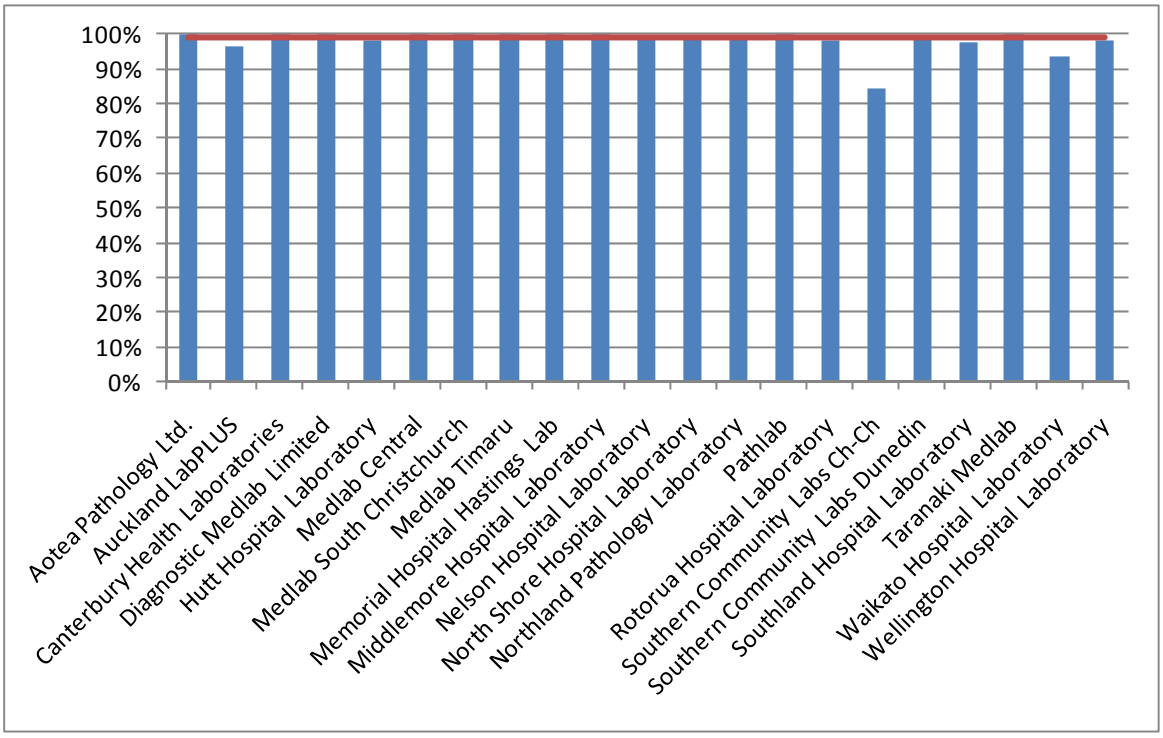
Target: 100% within 15 working days (red line)

Figure 31 - Timeliness of histology reporting by laboratory, 1 July to 31 December 2008 - proportion reported in five working days or less



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

Figure 32 - Timeliness of histology reporting by laboratory, 1 July to 31 December 2008 - proportion reported within 15 working days or less



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

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

Definition

The proportion of women (20-69 years) who have had a cervical smear showing a high grade cytology result for whom no 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 1 January 2008 – 30 June 2008), 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 NZ 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 (NZ modified TBS 2005 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, HPV test, or subsequent smear test) 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 31 December 2008).

Target

90% of women should have a histology report within 90 days of their cytology report date.

Current Situation

There were 3,638 high grade cytology results relating to samples collected in the period 1 January 2008 – 30 June 2008; 3,502 in women aged 20-69 years at the end of the period. 1,044 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 the cytology tests were excluded from this measure. This left 2,458 cytology tests, which related to 2,348 women aged 20-69 years at the end of the reporting period. Histological follow-up for these 2,348 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, 1,828 women (77.9%) aged 20-69 years at the end of the period had a histology report within 90 days of their cytology report, and 1,982 (84.4%) had a histology report within 180 days. This is below the target of 90% within 90 days.

The proportion of women with a histology report within 90 days of their cytology report varied by DHB from 59.1% (Wairarapa) to 92.6% (Southland). By 180 days this had increased to 69.6% (Whanganui) to 93.8% (Southland) (Figure 33, Table 46). Southland was the only DHB to meet the target for the proportion of women with histology within 90 days; no DHBs met the target for 180 days.

The proportion of women with a histology report also varies by age, from 63.2% (ages 65-69 years) to 82.2% (ages 35-39 years) within 90 days, and from to 73.7% (ages 65-69 years) to 89.6% (ages 35-39 years) within 180 days (Figure 34, Table 47). 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 71.5% (Māori) to 79.9% (European/ Other) at 90 days. By 180 days, however, the difference had narrowed slightly, and histology reports were available for 80.0% of Māori women and 85.8% of European women/ women from other ethnic groups (Table 18, Table 19).

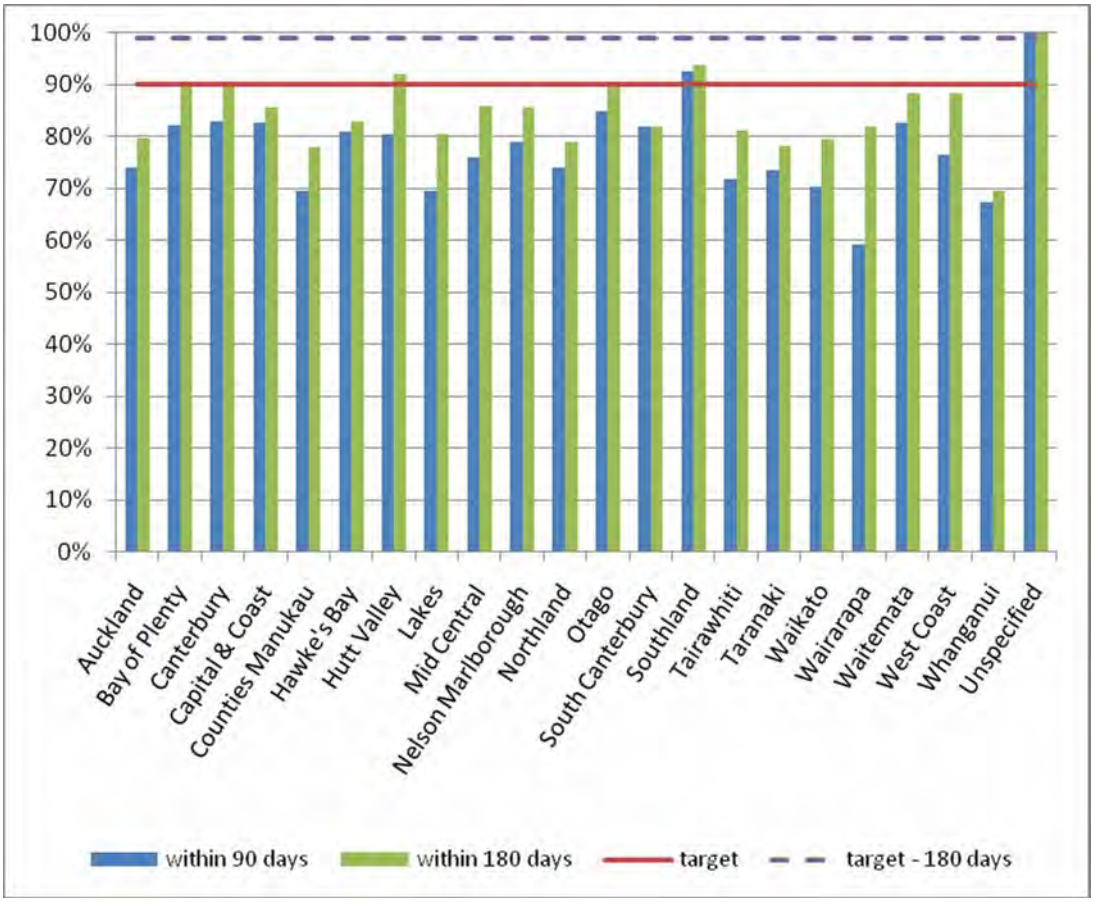
Further breakdown by DHB and ethnicity is shown in Table 18 and Table 19, and breakdown by DHB and age is shown in Table 20 and Table 21.

Any follow-up tests

When follow-up tests of any kind (colposcopy, histology, an HPV test, or a subsequent cytology test) were considered, there remained 169 women (7.2%) who had no record of any subsequent follow-up within 180 days on the NCSP Register, and 95 women (4.0%) who had no record of a follow-up test at 360 days (Figure 35, Table 48). This varied by DHB at 180 days from 0.0% (West Coast) to 11.5% (Waikato), and at 360 days from 0.0% (Hutt Valley, South Canterbury, West Coast) to 8.7% (Whanganui). It also varied by ethnicity, from 5.7% (European/ Other) to 15.5% (Pacific) at 180 days, and from 3.1%

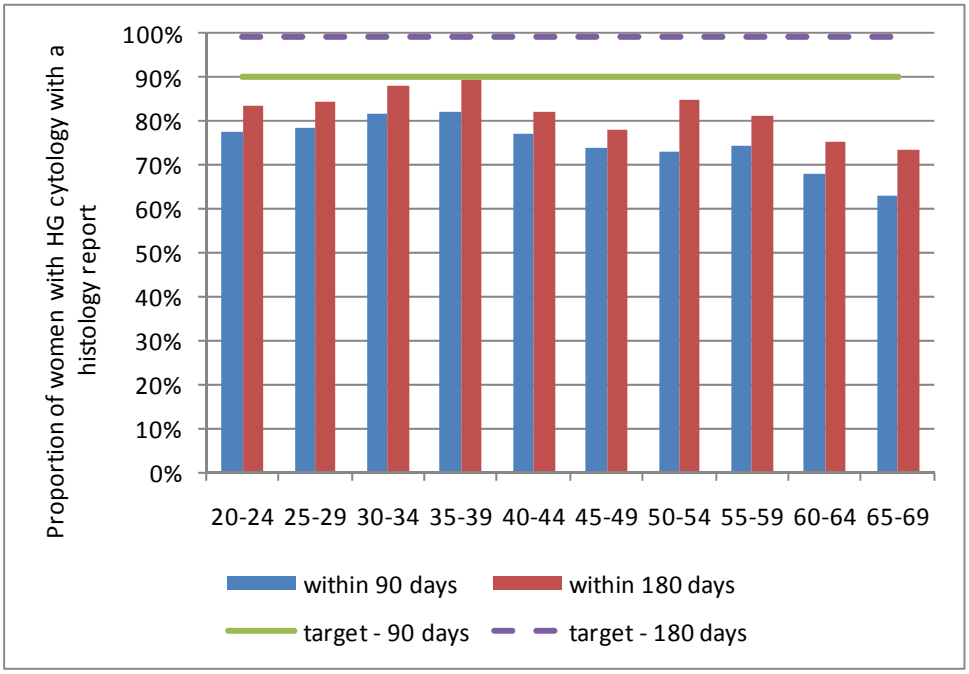
	(European/ Other) to 10.7% (Pacific) at 360 days.
Trends	The definition of this indicator has changed slightly from 2007, from the proportion with histology within 12 weeks (2007 report) to the proportion within 90 days (this report). The proportion with a histology report within 180 days is a new measure which was not reported on for 2007. As a result, trends are not reported on in this report.
Comments	The definition of this indicator has changed slightly compared to previous reports. The proportion of women with a follow-up test of any kind provides useful additional information. While nationally 32.5% of women with high grade cytology reports had no record of histology within 180 days, the proportion without a record of a follow-up test of any kind was much lower (7.2%). 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 tests 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 cytology without this indication should have been followed up in some way, regardless of other cytology results in the period. All of the cytology tests selected for follow up indicated that referral or further assessment was recommended. The risk level for women with no recorded biopsy is difficult to ascertain because a lack of histology can be due to a number of reasons, including: i) examined but no biopsy taken, ii) did not attend (DNA)/ refusal to attend, iii) a wait time issue. Women who do not/ refuse to attend are at highest risk due to not having had a 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 33 - 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

Figure 34 - Proportion of women (ages 20-69 years) with a histology report within 90 and 180 days of a high grade cytology report, by age



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	12	75.0	15	71.4	23	62.2	115	77.2
Bay of Plenty	27	87.1	0	0.0	0	0.0	75	84.3
Canterbury	22	84.6	3	100.0	15	93.8	197	81.7
Capital & Coast	9	69.2	3	75.0	3	60.0	71	86.6
Counties Manukau	25	58.1	17	73.9	17	85.0	64	70.3
Hawke's Bay	30	73.2	1	100.0	1	100.0	82	83.7
Hutt Valley	10	90.9	2	100.0	1	100.0	28	75.7
Lakes	15	60.0	1	100.0	3	60.0	38	74.5
Mid Central	7	46.7	1	50.0	2	100.0	60	82.2
Nelson Marlborough	7	77.8	1	100.0	-	-	63	78.8
Northland	25	75.8	2	100.0	1	100.0	49	72.1
Otago	12	92.3	1	50.0	3	75.0	101	84.9
South Canterbury	-	-	-	-	-	-	27	81.8
Southland	9	100.0	-	-	3	75.0	63	92.6
Tairawhiti	14	77.8	-	-	-	-	9	64.3
Taranaki	10	76.9	-	-	1	33.3	36	75.0
Waikato	30	62.5	5	62.5	9	75.0	103	73.1
Wairarapa	3	60.0	-	-	-	-	10	58.8
Waitemata	14	66.7	10	83.3	19	79.2	148	85.1
West Coast	0	0.0	-	-	-	-	13	81.3
Whanganui	8	61.5	-	-	-	-	23	69.7
Unspecified	-	-	-	-	-	-	*1*	*100.0*
Total	**289**	**71.5**	**62**	**73.8**	**101**	**73.7**	**1,376**	**79.9**

' – ' 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	15	93.8	17	81.0	26	70.3	120	80.5
Bay of Plenty	29	93.5	1	50.0	0	0.0	82	92.1
Canterbury	23	88.5	3	100.0	16	100.0	215	89.2
Capital & Coast	10	76.9	4	100.0	3	60.0	72	87.8
Counties Manukau	29	67.4	18	78.3	20	100.0	71	78.0
Hawke's Bay	32	78.0	1	100.0	1	100.0	83	84.7
Hutt Valley	10	90.9	2	100.0	1	100.0	34	91.9
Lakes	20	80.0	1	100.0	4	80.0	41	80.4
Mid Central	9	60.0	1	50.0	2	100.0	67	91.8
Nelson Marlborough	8	88.9	1	100.0	-	-	68	85.0
Northland	25	75.8	2	100.0	1	100.0	54	79.4
Otago	12	92.3	1	50.0	4	100.0	108	90.8
South Canterbury	-	-	-	-	-	-	27	81.8
Southland	9	100.0	-	-	3	75.0	64	94.1
Tairawhiti	16	88.9	-	-	-	-	10	71.4
Taranaki	11	84.6	-	-	2	66.7	37	77.1
Waikato	33	68.8	5	62.5	10	83.3	118	83.7
Wairarapa	5	100.0	-	-	-	-	13	76.5
Waitemata	17	81.0	12	100.0	19	79.2	156	89.7
West Coast	1	100.0	-	-	-	-	14	87.5
Whanganui	9	69.2	-	-	-	-	23	69.7
Unspecified	-	-	-	-	-	-	*1*	*100.0*
Total	**323**	**80.0**	**69**	**82.1**	**112**	**81.8**	**1,478**	**85.8**

' – ' 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	23	76.7	43	70.5	32	84.2	20	76.9	18	69.2	11	78.6	6	60.0	4	80.0	6	60.0	2	66.7	165
Bay of Plenty	15	71.4	16	72.7	19	86.4	21	95.5	14	87.5	8	88.9	3	60.0	3	75.0	3	100.0	0	0.0	102
Canterbury	64	84.2	51	85.0	48	94.1	26	78.8	15	83.3	16	80.0	5	71.4	5	55.6	5	71.4	2	40.0	237
Capital & Coast	27	84.4	19	73.1	11	84.6	7	100.0	6	85.7	6	100.0	4	100.0	3	60.0	1	50.0	2	100.0	86
Counties Manukau	20	60.6	21	67.7	19	65.5	16	76.2	20	83.3	4	36.4	10	76.9	6	85.7	2	100.0	5	83.3	123
Hawke's Bay	17	65.4	24	85.7	23	76.7	13	92.9	17	94.4	12	80.0	5	100.0	1	50.0	2	66.7	0	0.0	114
Hutt Valley	7	87.5	7	77.8	9	81.8	8	80.0	6	75.0	0	0.0	3	100.0	-	-	1	100.0	-	-	41
Lakes	13	81.3	11	68.8	13	68.4	7	70.0	5	83.3	4	50.0	2	50.0	-	-	1	100.0	1	50.0	57
Mid Central	19	59.4	21	91.3	7	87.5	6	100.0	9	81.8	1	33.3	2	50.0	1	100.0	2	100.0	2	100.0	70
Nelson Marlborough	12	63.2	10	66.7	14	100.0	9	81.8	6	75.0	4	100.0	9	90.0	6	85.7	1	50.0	-	-	71
Northland	14	66.7	12	80.0	9	81.8	14	82.4	7	70.0	10	76.9	7	70.0	2	50.0	1	50.0	1	100.0	77
Otago	36	92.3	19	79.2	20	87.0	14	87.5	7	77.8	8	88.9	7	87.5	4	100.0	0	0.0	2	66.7	117
South Canterbury	7	70.0	5	100.0	3	100.0	3	100.0	1	50.0	3	100.0	2	66.7	2	100.0	-	-	1	50.0	27
Southland	18	94.7	24	100.0	15	88.2	3	75.0	4	66.7	5	100.0	2	100.0	2	100.0	1	100.0	1	100.0	75
Tairawhiti	9	100.0	3	42.9	2	40.0	6	100.0	0	0.0	2	66.7	1	100.0	-	-	-	-	-	-	23
Taranaki	10	66.7	13	76.5	7	77.8	7	70.0	2	100.0	4	80.0	1	100.0	2	100.0	1	50.0	0	0.0	47
Waikato	31	77.5	22	68.8	23	67.6	23	79.3	19	79.2	10	71.4	8	50.0	5	62.5	4	80.0	2	28.6	147
Wairarapa	2	50.0	2	66.7	0	0.0	2	66.7	2	100.0	1	50.0	3	75.0	0	0.0	1	100.0	-	-	13
Waitemata	35	89.7	43	86.0	31	88.6	34	87.2	12	54.5	11	68.8	10	76.9	8	88.9	4	80.0	3	100.0	191
West Coast	5	100.0	2	100.0	5	83.3	0	0.0	-	-	-	-	1	100.0	0	0.0	-	-	-	-	13
Whanganui	8	66.7	9	81.8	4	80.0	4	57.1	3	75.0	1	33.3	1	50.0	1	100.0	0	0.0	-	-	31
Unspecified	-	-	-	-	-	-	*1*	*100.0*	-	-	-	-	-	-	-	-	-	-	-	-	*1*
Total	**392**		**377**		**314**		**244**		**173**		**121**		**92**		**55**		**36**		**24**		**1,828**

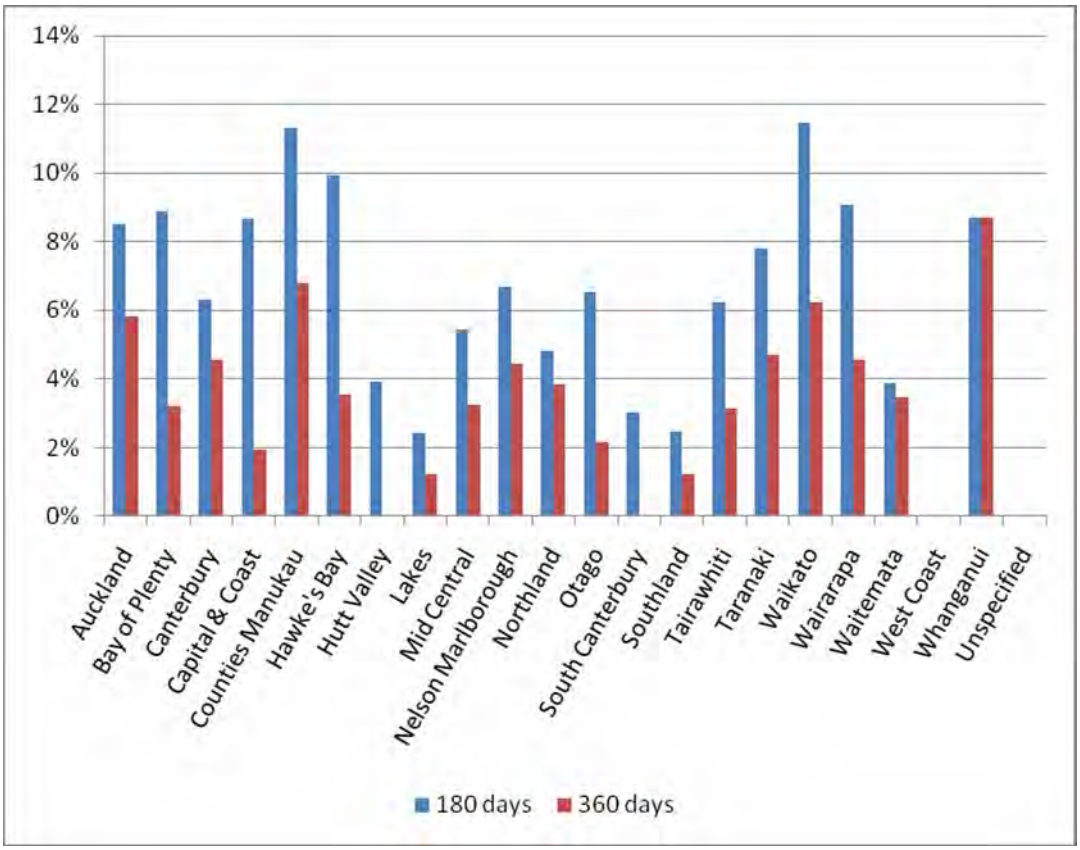
'– ' indicates there were no women in this sub-category with a high grade cytology report

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	24	80.0	48	78.7	34	89.5	23	88.5	19	73.1	11	78.6	7	70.0	4	80.0	6	60.0	2	66.7	178
Bay of Plenty	17	81.0	19	86.4	21	95.5	22	100.0	15	93.8	8	88.9	4	80.0	3	75.0	3	100.0	0	0.0	112
Canterbury	69	90.8	54	90.0	49	96.1	28	84.8	16	88.9	18	90.0	6	85.7	8	88.9	6	85.7	3	60.0	257
Capital & Coast	29	90.6	19	73.1	11	84.6	7	100.0	6	85.7	6	100.0	4	100.0	3	60.0	2	100.0	2	100.0	89
Counties Manukau	21	63.6	24	77.4	23	79.3	19	90.5	20	83.3	5	45.5	12	92.3	6	85.7	2	100.0	6	100.0	138
Hawke's Bay	18	69.2	24	85.7	24	80.0	13	92.9	17	94.4	12	80.0	5	100.0	1	50.0	3	100.0	0	0.0	117
Hutt Valley	7	87.5	8	88.9	11	100.0	10	100.0	7	87.5	0	0.0	3	100.0	-	-	1	100.0	-	-	47
Lakes	14	87.5	12	75.0	16	84.2	8	80.0	6	100.0	4	50.0	3	75.0	-	-	1	100.0	2	100.0	66
Mid Central	24	75.0	21	91.3	8	100.0	6	100.0	10	90.9	2	66.7	3	75.0	1	100.0	2	100.0	2	100.0	79
Nelson Marlborough	14	73.7	10	66.7	14	100.0	10	90.9	7	87.5	4	100.0	10	100.0	7	100.0	1	50.0	-	-	77
Northland	15	71.4	12	80.0	9	81.8	14	82.4	7	70.0	11	84.6	9	90.0	2	50.0	2	100.0	1	100.0	82
Otago	37	94.9	20	83.3	22	95.7	15	93.8	9	100.0	9	100.0	7	87.5	4	100.0	0	0.0	2	66.7	125
South Canterbury	7	70.0	5	100.0	3	100.0	3	100.0	1	50.0	3	100.0	2	66.7	2	100.0	-	-	1	50.0	27
Southland	18	94.7	24	100.0	15	88.2	4	100.0	4	66.7	5	100.0	2	100.0	2	100.0	1	100.0	1	100.0	76
Tairawhiti	9	100.0	6	85.7	2	40.0	6	100.0	0	0.0	2	66.7	1	100.0	-	-	-	-	-	-	26
Taranaki	11	73.3	14	82.4	7	77.8	8	80.0	2	100.0	4	80.0	1	100.0	2	100.0	1	50.0	0	0.0	50
Waikato	34	85.0	25	78.1	28	82.4	25	86.2	19	79.2	11	78.6	12	75.0	5	62.5	4	80.0	3	42.9	166
Wairarapa	4	100.0	3	100.0	0	0.0	3	100.0	2	100.0	1	50.0	4	100.0	0	0.0	1	100.0	-	-	18
Waitemata	38	97.4	47	94.0	33	94.3	36	92.3	14	63.6	11	68.8	10	76.9	8	88.9	4	80.0	3	100.0	204
West Coast	5	100.0	2	100.0	5	83.3	1	50.0	-	-	-	-	1	100.0	1	100.0	0	0.0	-	-	15
Whanganui	8	66.7	10	90.9	4	80.0	4	57.1	3	75.0	1	33.3	1	50.0	1	100.0	0	0.0	-	-	32
Unspecified	-	-	-	-	-	-	*1*	*100.0*	-	-	-	-	-	-	-	-	-	-	-	-	*1*
Total	**423**		**407**		**339**		**266**		**184**		**128**		**107**		**60**		**40**		**28**		**1,982**

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

Figure 35 – 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 include measures such as: 1. Waiting time for colposcopic assessment of women with 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 are 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.

Appendix A – Additional data

Indicator 1 - Coverage

Table 22 - Coverage by age (women 20-69 years) screened in the three years prior to 31 December 2008, hysterectomy adjusted

Age group	Hysterectomy-adjusted population	Women screened in the last 3 years	
		N	%
20-24	138,856	80,492	58.0
25-29	126,643	94,216	74.4
30-34	143,204	100,838	70.4
35-39	156,288	120,243	76.9
40-44	154,324	117,809	76.3
45-49	137,222	116,257	84.7
50-54	109,471	92,823	84.8
55-59	94,032	73,648	78.3
60-64	70,367	58,818	83.6
65-69	60,445	41,040	67.9
TOTAL	**1,190,853**	**896,184**	**75.3**

Target: 75%

Table 23 - Coverage by DHB (women 25-69 years) screened in the three years prior to 31 December 2008, hysterectomy adjusted

DHB	Hysterectomy-adjusted population	Women screened in the last 3 years	
		N	%
Auckland	121,197	88,405	72.9
Bay of Plenty	49,456	40,081	81.0
Canterbury	119,230	95,729	80.3
Capital & Coast	74,302	60,514	81.4
Counties Manukau	111,484	79,706	71.5
Hawke's Bay	37,275	29,195	78.3
Hutt Valley	35,428	27,780	78.4
Lakes	25,793	19,429	75.3
Mid Central	39,320	29,351	74.6
Nelson Marlborough	34,930	27,734	79.4
Northland	37,252	28,193	75.7
Otago	43,342	35,911	82.9
South Canterbury	13,112	10,355	79.0
Southland	27,498	21,286	77.4
Tairawhiti	10,808	8,394	77.7
Taranaki	25,596	22,162	86.6
Waikato	82,602	65,894	79.8
Wairarapa	9,675	7,593	78.5
Waitemata	130,773	100,495	76.8
West Coast	7,628	5,767	75.6
Whanganui	15,218	11,003	72.3
Unspecified	*77*	*715*	-
Total	**1,051,997**	**815,692**	**77.5**

Target: 75%

Table 24 - Coverage by ethnicity (women 25-69 years) screened in the three years prior to 31 December 2008, hysterectomy adjusted

Ethnicity	Hysterectomy adjusted population	Women screened in the last 3 years (ages 25-69 years)	
	(ages 25-69 years)	N	%
Māori	138,653	76,882	55.4
Pacific	58,608	34,999	59.7
Asian	106,289	65,335	61.5
European/ Other	748,447	638,476	85.3
Total	**1,051,997**	**815,692**	**77.5**

Table 25 - Coverage by ethnicity (women 25-69 years) screened in the three years prior to 31 December 2008, hysterectomy adjusted – 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	138,653	91,873	66.3
Pacific	58,608	39,145	66.8
Asian	106,289	85,655	80.6
European/ Other	748,447	591,048	79.0

Table 26 - Coverage by ethnicity (women 20-69 years) screened in the three years prior to 31 December 2008, hysterectomy adjusted – 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	163,913	107,289	65.5
Pacific	68,598	44,389	64.7
Asian	129,626	91,339	70.5
European/ Other	828,716	641,459	77.4

Table 27 - Coverage by age (women 20-69 years) screened in the five years prior to 31 December 2008, hysterectomy adjusted

Age group	Number of women screened in last 5 years	Hysterectomy-adjusted population	% screened in the last 5 years
20-24	86,881	138,856	62.6
25-29	113,725	126,643	89.8
30-34	119,829	143,204	83.7
35-39	140,610	156,288	90.0
40-44	136,580	154,324	88.5
45-49	134,208	137,222	97.8
50-54	107,464	109,471	98.2
55-59	84,578	94,032	89.9
60-64	67,299	70,367	95.6
65-69	47,737	60,445	79.0
TOTAL	**1,038,911**	**1,190,853**	**87.2**

Table 28 - Coverage by DHB – women (aged 25-69 years) screened in the five years prior to 31 December 2008, hysterectomy adjusted

DHB	Hysterectomy adjusted population	Women screened in the last 5 years	
		N	%
Auckland	121,197	104,874	86.5
Bay of Plenty	49,456	46,522	94.1
Canterbury	119,230	111,587	93.6
Capital & Coast	74,302	70,117	94.4
Counties Manukau	111,484	94,311	84.6
Hawke's Bay	37,275	33,810	90.7
Hutt Valley	35,428	32,369	91.4
Lakes	25,793	22,615	87.7
Mid Central	39,320	34,193	87.0
Nelson Marlborough	34,930	31,880	91.3
Northland	37,252	33,200	89.1
Otago	43,342	41,384	95.5
South Canterbury	13,112	12,015	91.6
Southland	27,498	24,626	89.6
Tairawhiti	10,808	10,008	92.6
Taranaki	25,596	25,368	99.1
Waikato	82,602	76,328	92.4
Wairarapa	9,675	8,721	90.1
Waitemata	130,773	116,641	89.2
West Coast	7,628	6,691	87.7
Whanganui	15,218	12,935	85.0
Unspecified	-	*888*	*n/a*
Total	**1,051,997**	**951,083**	**90.4**

Table 29 - Coverage by ethnicity – women (aged 25-69 years) screened in the five years prior to 31 December 2008, hysterectomy adjusted

Ethnicity	Hysterectomy adjusted population	Women screened in the last 5 years	
		N	%
Māori	138,653	93,654	67.5
Pacific	58,608	42,265	72.1
Asian	106,289	76,595	72.1
European/ Other	748,447	738,569	98.7
TOTAL	**1,051,997**	**951,083**	**90.4**

Table 30 - Women under 20 years of age, and aged 15-19 years, screened in the last three years, by DHB, 31 December 2008

DHB	Number of women screened in last 3 years		% of population aged 15-19 years screened
	aged < 20 years	aged 15-19 years	
Auckland	2,249	2,237	13.8
Bay of Plenty	788	783	10.3
Canterbury	3,475	3,456	19.0
Capital & Coast	1,235	1,229	10.7
Counties Manukau	3,021	2,980	14.5
Hawke's Bay	833	824	13.5
Hutt Valley	578	572	9.7
Lakes	470	467	10.8
Mid Central	621	615	8.2
Nelson Marlborough	572	568	12.3
Northland	625	618	9.9
Otago	1,115	1,107	12.6
South Canterbury	344	336	17.8
Southland	575	571	14.9
Tairawhiti	266	263	13.0
Taranaki	558	553	13.1
Waikato	1,202	1,197	7.9
Wairarapa	179	177	12.0
Waitemata	2,894	2,874	14.3
West Coast	149	149	14.0
Whanganui	219	217	8.1
Unspecified	*20*	*20*	-
Total	**21,990**	**21,813**	**12.8**

Table 31 – Women screened under 20 years of age, as a proportion of all women screened in the last three years, by DHB, 31 December 2008

DHB	Number of women screened in last 3 years		Proportion of women screened who were aged < 20 years (%)
	aged < 20 years	all ages	
Auckland	2,249	99,850	2.3
Bay of Plenty	788	45,116	1.7
Canterbury	3,475	109,578	3.2
Capital & Coast	1,235	69,060	1.8
Counties Manukau	3,021	90,797	3.3
Hawke's Bay	833	32,788	2.5
Hutt Valley	578	30,957	1.9
Lakes	470	21,792	2.2
Mid Central	621	33,594	1.8
Nelson Marlborough	572	30,685	1.9
Northland	625	31,505	2.0
Otago	1,115	41,878	2.7
South Canterbury	344	11,622	3.0
Southland	575	24,108	2.4
Tairawhiti	266	9,525	2.8
Taranaki	558	24,959	2.2
Waikato	1,202	74,839	1.6
Wairarapa	179	8,404	2.1
Waitemata	2,894	112,730	2.6
West Coast	149	6,418	2.3
Whanganui	219	12,419	1.8
Unspecified	*20*	*810*	*2.5*
Total	**21,990**	**923,434**	**2.4**

Indicator 2 – First screening events

Table 32 - Age distribution of first screening events for the period 1 July to 31 December 2008

Age group	Number of first screening events	% of first events which are in that age group
20-24	9,333	40.5
25-29	3,634	15.8
30-34	2,479	10.8
35-39	2,077	9.0
40-44	1,625	7.1
45-49	1,346	5.8
50-54	893	3.9
55-59	719	3.1
60-64	521	2.3
65-69	397	1.7
Total (20-69 years)	**23,024**	

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

Table 33 - Women with a first screening event as a proportion of all women with screening event (ages 20-69 years) by ethnicity, 1 July to 31 December 2008: counts weighted using ethnicity adjustors to correct for undercounting in NCSP Register

Ethnicity	Women with first events	As a proportion of women with a screening event[i]		As a proportion of eligible population[ii]	
		N	%	N	%
Māori	2,711	26,107	10.4	163,913	1.7
Pacific	2,168	11,383	19.0	68,598	3.2
Asian	5,695	23,878	23.9	129,626	4.4
European/ Other	12,828	150,769	8.5	828,716	1.5

Indicator 3 – Withdrawals

Table 34 - Withdrawal rates by DHB for the period 1 July to 31 December 2008

DHB	Enrolled at start	Women withdrawn	
		N	%
Auckland	165,699	18	0.011
Bay of Plenty	69,604	1	0.001
Canterbury	163,660	8	0.005
Capital	103,991	7	0.007
Counties Manukau	140,559	11	0.008
Hawke's Bay	50,635	7	0.014
Hutt Valley	50,245	2	0.004
Lakes	34,413	1	0.003
Mid Central	53,706	-	-
Nelson Marlborough	44,942	5	0.011
Northland	48,793	2	0.004
Otago	64,128	10	0.016
South Canterbury	17,956	2	0.011
Southland	37,165	-	-
Tairawhiti	15,297	1	0.007
Taranaki	36,729	6	0.016
Waikato	113,024	6	0.005
Wairarapa	11,675	-	-
Waitemata	167,373	17	0.010
West Coast	9,832	-	-
Whanganui	20,599	1	0.005
Unspecified	*14,060*	*6*	*0.043*
Total	**1,434,085**	**111**	**0.008**

Indicator 4 – Early re-screening

Table 35 - Early re-screening by five year age group, 1 July to 31 December 2008 (cohort method)

Age	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
20-24	1,144	414	36.2
25-29	3,720	1,135	30.5
30-34	4,341	1,327	30.6
35-39	5,642	1,741	30.9
40-44	5,896	1,829	31.0
45-49	5,984	1,789	29.9
50-54	4,917	1,520	30.9
55-59	3,862	1,045	27.1
60-64	3,338	827	24.8
65-69	2,288	444	19.4
TOTAL	**41,132**	**12,071**	**29.3**

Table 36 - Early re-screening by five year age group, 1 July to 31 December 2008 (previously used method) – 33 month definition

Age	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
20-24	33,249	4,433	13.3
25-29	53,523	6,848	12.8
30-34	61,098	7,712	12.6
35-39	77,394	9,578	12.4
40-44	79,541	10,148	12.8
45-49	80,737	10,427	12.9
50-54	66,700	8,508	12.8
55-59	54,681	6,364	11.6
60-64	44,644	4,385	9.8
65-69	31,653	2,647	8.4
TOTAL	**583,220**	**71,050**	**12.2**

Table 37 - Early re-screening by five year age group, 1 July to 31 December 2008 (previously used method) – 30 month definition

Age	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
20-24	31,655	3,629	11.5
25-29	49,838	5,411	10.9
30-34	56,906	5,960	10.5
35-39	71,867	7,471	10.4
40-44	73,826	7,986	10.8
45-49	74,840	8,289	11.1
50-54	61,875	6,833	11.0
55-59	50,603	5,057	10.0
60-64	41,090	3,463	8.4
65-69	28,933	2,070	7.2
Total	**541,433**	**56,169**	**10.4**

Table 38 - Early re-screening by DHB, 1 July to 31 December 2008 (cohort method)

DHB	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
Auckland	4,481	1,793	40.0
Bay of Plenty	2,023	728	36.0
Canterbury	4,945	1,380	27.9
Capital & Coast	3,253	961	29.5
Counties Manukau	3,876	1,212	31.3
Hawke's Bay	1,415	348	24.6
Hutt Valley	1,509	336	22.3
Lakes	996	390	39.2
Mid Central	1,473	279	18.9
Nelson Marlborough	1,426	261	18.3
Northland	1,452	427	29.4
Otago	1,772	303	17.1
South Canterbury	528	110	20.8
Southland	983	190	19.3
Tairawhiti	428	73	17.1
Taranaki	1,053	142	13.5
Waikato	3,058	595	19.5
Wairarapa	428	107	25.0
Waitemata	5,195	2,255	43.4
West Coast	266	45	16.9
Whanganui	543	125	23.0
Unspecified	*29*	*11*	*37.9*
Total	**41,132**	**12,071**	**29.3**

Table 39 - Early re-screening by ethnicity, 1 July to 31 December 2008 (cohort method)

Ethnicity	Women recommended to return in 3 yrs	Women with >= 1 subsequent test	
		N	%
Māori	3,289	887	27.0
Pacific	1,356	350	25.8
Asian	3,046	1,056	34.7
European/ Other	33,441	9,778	29.2
Total	**41,132**	**12,071**	**29.3**

Indicator 5 – Laboratory indicators

Indicator 5.2 – Accuracy of cytology predicting HSIL

Table 40 - Positive predictive value of a report of HSIL+SC cytology by laboratory, 1 July to 31 December 2008

Laboratory	Histology available		HSIL confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Aotea Pathology Ltd	66	86.8	46	69.7	10	13.2	76
Auckland LabPLUS	234	90.0	211	90.2	26	10.0	260
Canterbury Health Laboratories	178	91.8	154	86.5	16	8.2	194
Diagnostic Medlab Ltd	214	89.5	177	82.7	25	10.5	239
Medlab Central Ltd	124	87.3	108	87.1	18	12.7	142
Medlab South Christchurch	53	91.4	41	77.4	5	8.6	58
Pathlab	126	90.0	97	77.0	14	10.0	140
Southern Community Labs Ch-Ch	68	93.2	60	88.2	5	6.8	73
Southern Community Labs Dunedin	303	90.2	241	79.5	33	9.8	336
Total	**1,366**	**90.0**	**1,135**	**83.1**	**152**	**10.0**	**1,518**

Target: 65% - 85%

Table 41 - Positive predictive value of a report of ASC-H cytology by laboratory, 1 July to 31 December 2008

Laboratory	Histology available		ASC-H confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Aotea Pathology Ltd	78	81.3	28	35.9	18	18.8	96
Auckland LabPLUS	200	71.9	109	54.5	78	28.1	278
Canterbury Health Laboratories	151	77.8	77	51.0	43	22.2	194
Diagnostic Medlab Ltd	297	78.0	126	42.4	84	22.0	381
Medlab Central Ltd	91	70.5	45	49.5	38	29.5	129
Medlab South Christchurch	63	82.9	29	46.0	13	17.1	76
Pathlab	122	78.2	51	41.8	34	21.8	156
Southern Community Labs Ch-Ch	30	88.2	14	46.7	4	11.8	34
Southern Community Labs Dunedin	73	82.0	38	52.1	16	18.0	89
Total	**1,105**	**77.1**	**517**	**46.8**	**328**	**22.9**	**1,433**

Table 42 - Positive predictive value of a report of ASC-H + HSIL + SC cytology by laboratory, 1 July to 31 December 2008

Laboratory	Histology available		Abnormality confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Aotea Pathology Ltd	144	83.7	74	51.4	28	16.3	172
Auckland LabPLUS	434	80.7	320	73.7	104	19.3	538
Canterbury Health Laboratories	329	84.8	231	70.2	59	15.2	388
Diagnostic Medlab Ltd	511	82.4	303	59.3	109	17.6	620
Medlab Central Ltd	215	79.3	153	71.2	56	20.7	271
Medlab South Christchurch	116	86.6	70	60.3	18	13.4	134
Pathlab	248	83.8	148	59.7	48	16.2	296
Southern Community Labs Ch-Ch	98	91.6	74	75.5	9	8.4	107
Southern Community Labs Dunedin	376	88.5	279	74.2	49	11.5	425
Total	**2,471**	**83.7**	**1,652**	**66.9**	**480**	**16.3**	**2,951**

Table 43 - Positive predictive value of a report of glandular abnormalities (AG1-AG5, AC1-AC4) by laboratory, 1 July to 31 December 2008

Laboratory	Histology available		Abnormality confirmed by histology		No histology		Total reports
	N	%	N	%	N	%	N
Aotea Pathology Ltd.	7	63.6	5	71.4	4	36.4	11
Auckland LabPLUS	67	76.1	23	34.3	21	23.9	88
Canterbury Health Laboratories	21	67.7	8	38.1	10	32.3	31
Diagnostic Medlab Ltd	37	74.0	17	45.9	13	26.0	50
Medlab Central Ltd	18	64.3	10	55.6	10	35.7	28
Medlab South Christchurch	7	58.3	4	57.1	5	41.7	12
Pathlab	34	72.3	13	38.2	13	27.7	47
Southern Community Labs Ch-Ch	4	66.7	2	50.0	2	33.3	6
Southern Community Labs Dunedin	22	84.6	12	54.5	4	15.4	26
Total	**217**	**72.6**	**94**	**43.3**	**82**	**27.4**	**299**

Indicator 5.5 – Laboratory turnaround time

Table 44 - Timeliness of cytology reporting by laboratory, 1 July to 31 December 2008

	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.	20,769	93.5	1,431	6.4	22,200	100.0	8	0.04	**22,208**
Auckland LabPLUS	8,444	69.8	3,331	27.5	11,775	97.3	329	2.7	**12,104**
Canterbury Health Laboratories	5,742	28.5	7,901	39.2	13,643	67.6	6,525	32.4	**20,168**
Diagnostic Medlab Ltd	73,685	99.4	322	0.4	74,007	99.8	116	0.2	**74,123**
Medlab Central Ltd	21,363	98.3	357	1.6	21,720	100.0	2	0.01	**21,722**
Medlab South Christchurch	16,250	98.4	260	1.6	16,510	100.0	-	0.0	**16,510**
Pathlab	10,183	100.0	-	0.0	10,183	100.0	-	0.0	**10,183**
Southern Community Labs: Ch-Ch	4,254	38.3	6,785	61.1	11,039	99.3	73	0.7	**11,112**
Southern Community Labs: Dunedin	29,042	89.1	3,401	10.4	32,443	99.5	170	0.5	**32,613**
Total	**189,732**	**86.0**	**23,788**	**10.8**	**213,520**	**96.7**	**7,223**	**3.3**	**220,743**

Target: 90 % within seven working days and 100% within 15 working days.
Note: total samples reported on for this Indicator (220,743) is different from that reported in Indicator 5.1. 'Total samples' here refers to all cytology received by laboratories within the reporting period. Indicator 5.1 shows the total number of samples taken during the period.

Table 45 - Timeliness of histology reporting by laboratory, 1 July to 31 December 2008

Laboratory	Laboratory turnaround time - histology								
	Within 5 days		6-15 days		Total <= 15 days		> 15 days		Total
	N	%	N	%	N	%	N	%	N
Aotea Pathology Ltd	311	81.8	68	17.9	379	99.7	1	0.3	**380**
Auckland LabPLUS	562	58.3	365	37.9	927	96.2	37	3.8	**964**
Canterbury Health Laboratories	1,264	86.5	195	13.3	1,459	99.9	2	0.1	**1,461**
Diagnostic Medlab Ltd	2,142	96.1	81	3.6	2,223	99.8	5	0.2	**2,228**
Hutt Hospital Laboratory	170	75.2	52	23.0	222	98.2	4	1.8	**226**
Medlab Central Ltd	896	97.1	27	2.9	923	100.0	-	0.0	**923**
Medlab South Christchurch	96	100.0	-	0.0	96	100.0	-	0.0	**96**
Medlab Timaru	175	100.0	-	0.0	175	100.0	-	0.0	**175**
Memorial Hospital Hastings Lab	224	96.1	9	3.9	233	100.0	-	0.0	**233**
Middlemore Hospital Laboratory	736	91.8	66	8.2	802	100.0	-	0.0	**802**
Nelson Hospital Laboratory	362	89.8	36	8.9	398	98.8	5	1.2	**403**
North Shore Hospital Laboratory	1,002	95.4	43	4.1	1,045	99.5	5	0.5	**1,050**
Northland Pathology Laboratory	377	94.5	20	5.0	397	99.5	2	0.5	**399**
Pathlab	1,386	92.0	121	8.0	1,507	100.0	-	0.0	**1,507**
Rotorua Hospital Laboratory	45	90.0	4	8.0	49	98.0	1	2.0	**50**
Southern Community Labs Ch-Ch	467	80.7	22	3.8	489	84.5	90	15.5	**579**
Southern Community Labs Dunedin	1,259	92.8	86	6.3	1,345	99.1	12	0.9	**1,357**
Southland Hospital Laboratory	31	77.5	8	20.0	39	97.5	1	2.5	**40**
Taranaki Medlab	256	97.0	8	3.0	264	100.0	-	0.0	**264**
Waikato Hospital Laboratory	105	55.9	71	37.8	176	93.6	12	6.4	**188**
Wellington Hospital Laboratory	224	52.7	194	45.6	418	98.4	7	1.6	**425**
Total	**12,090**	**87.9**	**1,476**	**10.7**	**13,566**	**98.7**	**184**	**1.3**	**13,750**

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

Note: total histology samples reported on for this Indicator (13,518) is different from that reported in Indicator 5.4 (17,421), as Indicator 5.5 includes all histology received by laboratories *within the reporting period, while 5.4 includes all histology taken within the reporting period*

Indicator 6 – Follow up of women with high grade cytology

Table 46 - 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 N	Follow-up histology within 90 days N	%	Follow-up histology within 180 days N	%
Auckland	223	165	74.0	178	79.8
Bay of Plenty	124	102	82.3	112	90.3
Canterbury	286	237	82.9	257	89.9
Capital & Coast	104	86	82.7	89	85.6
Counties Manukau	177	123	69.5	138	78.0
Hawke's Bay	141	114	80.9	117	83.0
Hutt Valley	51	41	80.4	47	92.2
Lakes	82	57	69.5	66	80.5
Mid Central	92	70	76.1	79	85.9
Nelson Marlborough	90	71	78.9	77	85.6
Northland	104	77	74.0	82	78.8
Otago	138	117	84.8	125	90.6
South Canterbury	33	27	81.8	27	81.8
Southland	81	75	92.6	76	93.8
Tairawhiti	32	23	71.9	26	81.3
Taranaki	64	47	73.4	50	78.1
Waikato	209	147	70.3	166	79.4
Wairarapa	22	13	59.1	18	81.8
Waitemata	231	191	82.7	204	88.3
West Coast	17	13	76.5	15	88.2
Whanganui	46	31	67.4	32	69.6
Unspecified	1	1	100.0	1	100.0
Total	**2,348**	**1,828**	**77.9**	**1,982**	**84.4**

Table 47 - Women (ages 20-69 years) with a histology report within 90 and 180 days of a high grade cytology report, by age

Age	Follow-up histology within 90 days		Follow-up histology within 180 days	
	N	%	N	%
20-24	392	77.5	423	83.6
25-29	377	78.4	407	84.6
30-34	314	81.6	339	88.1
35-39	244	82.2	266	89.6
40-44	173	77.2	184	82.1
45-49	121	73.8	128	78.0
50-54	92	73.0	107	84.9
55-59	55	74.3	60	81.1
60-64	36	67.9	40	75.5
65-69	24	63.2	28	73.7
Total	**1,828**	**77.9**	**1,982**	**84.4**

Table 48 - 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	223	19	8.5	13	5.8
Bay of Plenty	124	11	8.9	4	3.2
Canterbury	286	18	6.3	13	4.5
Capital & Coast	104	9	8.7	2	1.9
Counties Manukau	177	20	11.3	12	6.8
Hawke's Bay	141	14	9.9	5	3.5
Hutt Valley	51	2	3.9	-	0.0
Lakes	82	2	2.4	1	1.2
Mid Central	92	5	5.4	3	3.3
Nelson Marlborough	90	6	6.7	4	4.4
Northland	104	5	4.8	4	3.8
Otago	138	9	6.5	3	2.2
South Canterbury	33	1	3.0	-	0.0
Southland	81	2	2.5	1	1.2
Tairawhiti	32	2	6.3	1	3.1
Taranaki	64	5	7.8	3	4.7
Waikato	209	24	11.5	13	6.2
Wairarapa	22	2	9.1	1	4.5
Waitemata	231	9	3.9	8	3.5
West Coast	17	-	0.0	-	0.0
Whanganui	46	4	8.7	4	8.7
Unspecified	*1*	-	0.0	-	0.0
Total	**2,348**	**169**	**7.2**	**95**	**4.0**

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
SC	There are abnormal squamous cells showing changes consistent with squamous cell

TBS code	Descriptor
AG1	carcinoma 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 3 months
R3	Please repeat the smear within 3 months of the end of pregnancy
R4	Please repeat the smear in 3 months
R5	Please repeat the smear in 6 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

Appendix D – Indicator Definitions Targets and Reporting Details

Positive predictive value calculations

Table 49 – 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

Appendix F – Changes to method used for Indicator 4: Early Re-screening

Methods

Early re-screening has previously looked in a fixed 33-month time period (for this report, the period was 1 April 2006 – 31 December 2008) for any women who had >1 cytology sample in the time period, when the first of the cytology samples indicated that they did not need to be re-screened for three years. Here we consider an alternative, cohort-based approach, which follows up all women over the same period of time as each other. The cohort considered is women:

i) with an index cytology sample taken between 1 February 2006 – 31 March 2006 (inclusive), and
ii) who were aged 20 – 66 years at the time the cytology sample was taken (and hence remained within the screening target age throughout the period), and
iii) who were given a recommendation to return at the regular interval of three years as a result of their cytology sample in February/March 2006.

The proportion of these women who returned within 30 months (ie 2.5 years) of their index cytology sample is calculated. Note that women whose "early" cytology sample had an R14 code[6] attached are not regarded as having returned early, as clinical symptoms may have caused them to present early.

Rationale

Results from the previous approach probably underestimate early re-screening, as the exposure time varies for each woman. For example a woman whose first cytology sample was on 1 December 2008 is only counted as being re-screened early if she has a subsequent cytology sample within 30 days. If she returned six months after her initial cytology sample for another cytology sample, she would not be counted towards the total number of women re-screened early via the previous method, as her second cytology sample would be outside the fixed time window of 1 April 2006 – 31 December 2008. Her "exposure time" for the method is just one month, as that is the length of time over which she is followed. By contrast, a woman who screened at the beginning of the 33-month window will be counted as being re-screened early if she has a cytology sample up to 33 months later (her "exposure time" is 33 months). Therefore exposure time varies widely across women, and the definition of how soon after a cytology sample with a routine recall recommendation is regarded as early re-screening is not consistent for all women. We considered an approach where a period of time was defined, before which a woman would be regarded as returning early for a cytology sample, and applied this period to all women.

Discussion

As expected, the new definition results in a higher value, because all women are followed for the same length of time, and this period (30 months) is almost certainly longer than the average

[6] Interpretation of recommendation code R14 under NZ modified Bethesda 2001 is: "In view of the abnormal clinical history provided, urgent referral for assessment is recommended regardless of cytological findings"

period which applied under the old measure (presumably around the middle of the fixed time window, ie 16-17 months). However, the estimate is not inconsistent with data from Australia, where a similar method is used. Australia looks at women who return more than three months before the recommended interval, following a normal cytology sample (ie within 21 months, as the interval is two years). Early re-screening in Australia was 21% in a 2007 cohort, however this has been decreasing over the last decade – it was 32% in a 1999 cohort (earliest year for which comparable data are available). These figures should also be considered in the context of high screening participation in New Zealand (74.3% within three years; compared to 60.8% within two years and 73.7% within three years in Australia).[7]

[7] In both cases, these are crude rates among women aged 20-69 years, in the relevant time periods ending 31 December 2008

Appendix G – Analysis of the accuracy of use of R1 recommendation code

Methods

Accuracy of the R1 code, which was used to select the cohort that was followed up for 30 months was analysed. As previously, the cohort considered is women:

i) with an index cytology sample taken between 1 February 2006 – 31 March 2006 (inclusive), and
ii) who were aged 20 – 66 years at the time the cytology sample was taken (and hence remained within the screening target age throughout the period), and
iii) who were given a recommendation to return at the regular interval of three years as a result of their cytology sample in February/March 2006 (recommendation code R1).

Screening histories for all women in this cohort (N=41,132) were retrieved. Results relating to samples taken after the index cytology sample are excluded.

Women were then classified as having had the R1 recommendation code correctly or incorrectly assigned, as shown in Table 50.

Results

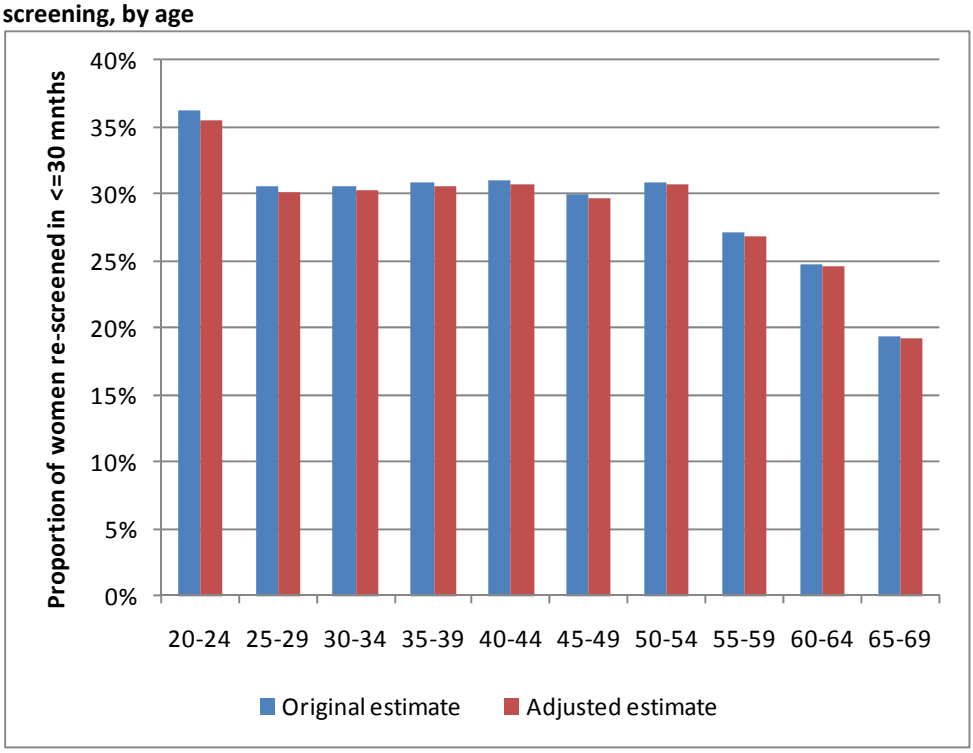
40,238 women (97.8%) were classified as having the R1 code correctly applied. 894 women (2.2%) with R1 codes appear to satisfy criteria which would prompt an earlier recall for screening than three years. The number of women who fell into each category is shown in Table 50.

Table 50 – Criteria for assessment of R1 code accuracy

R1 code classified as correct		R1 code classified as incorrect	
Criteria	**N (women)**	**Criteria**	**N (women)**
Women for whom this was their second consecutive negative smear within five years, **and**:		i) Women with no previous satisfactory cytology	450
i) History of only negative smears	34,604	ii) Women with no satisfactory cytology in the previous five years	326
ii) History of no worse than low grade cytology (and at least two consecutive negative results since the most recent low grade cytology, including current negative result)	5,601	iii) Women with previous high grade cytology and histology	7
		iv) Women with high grade cytology, and no subsequent histology	7
iii) History includes high grade cytology which histology confirmed as negative or low grade (and at least two consecutive negative results since then, including current negative result)	33	v) Abnormal history and not second consecutive negative smear since then	104
Total classified as correct:	**40,238**	**Total classified as incorrect:**	**894**

Estimates for early re-screening were then recalculated, completely excluding these 894 women. The overall proportion of the remaining 40,238 women who were re-screened within 30 months (adjusted estimate) was very similar to the original estimate (29.0% compared to 29.3%). The pattern of early re-screening by age remained very similar for the adjusted estimate, compared to the original estimate (Figure 36). For all age groups, the adjusted estimate for the proportion re-screened within 30 months was within one percentage point of the original estimate.

Figure 36 – Impact of excluding women where shorter recall was indicated from the estimate of early re-screening, by age



Discussion

In the period considered (early 2006), the R1 recommendation code was only rarely applied in cases where a shorter re-screen interval may have been recommended. The estimate for early re-screening may be overestimated by including women for whom a shorter interval may have been recommended. The effect seems to be very small, however, due to the very high proportion of cases where a recommendation code of R1 appears consistent with the woman's screening history.

The very large majority of cases where R1 may have been misapplied related to women without a recent negative result, or to women for whom it was their first result recorded on the register (in both cases NCSP policy is to recommend a one year follow-up). These two categories combined accounted for 87% of potentially misclassified results. While re-screening within 30 months was more common among these women than amongst the overall cohort (approximately 40% were re-screened within 30 months), it was not universal.

It should be noted that these findings relate to a specific group of women and period of time. It is possible that the accuracy of the R1 code may change over time.