National cervical screening monitoring indicators

This report monitors the performance of the National Cervical Screening Program using 10 indicators which measure program activity, performance and outcome. They help measure changes in disease patterns and examine the contribution health interventions may have in preventing or reducing deaths. They can also be used to help evaluate screening or other health interventions.

Screening indicators for the National Cervical Screening Program cover the areas of participation, early re-screening, low- and high-grade abnormality detection, incidence and mortality. These have been endorsed by the National Advisory Committee and state and territory cervical screening programs. Indicators are reviewed annually and, in this report, definitions of Indicators 2 and 5 have been changed compared with the definitions used in previous reports.

A listing of the 10 indicators and their definitions follows. The target age group for the National Cervical Screening Program is 20 to 69 years.

Indicator 1: Participation rate for cervical screening

Percentage of women screened in a 24-month period by 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69), for all ages (20–80+) and the target age group (20–69 years).

Indicator 2: Early re-screening

Proportion of women re-screened by number of re-screens during a 21-month period following a negative smear.

Indicator 3: Low-grade abnormality detection

Number of women with a histologically verified low-grade intraepithelial abnormality detected in a 12-month period as a ratio of the number of women with a histologically verified high-grade intraepithelial abnormality detected in the same period.

Indicator 4: High-grade abnormality detection

Detection rate for histologically verified high-grade intraepithelial abnormalities per 1,000 women screened in a 12-month period by 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years, age-standardised).

Indicator 5: Incidence of micro-invasive squamous cell carcinoma

Incidence rate of micro-invasive squamous cell carcinoma per 100,000 estimated resident female population in a 12-month period by 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years, age-standardised).

Indicator 6: Incidence of squamous, adenocarcinoma, adeno-squamous and other cervical cancer

Incidence rate of squamous, adenocarcinoma, adeno-squamous and other cervical cancers per 100,000 estimated resident female population in a 12-month period by 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years, age-standardised).

Indicator 7: Mortality

Death rate from cervical cancer per 100,000 estimated resident female population in a 12-month period by 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years, age-standardised).

Periodic indicators

Periodic indicators have been developed to report on issues that are of importance in monitoring the outcomes of the cervical screening program over a longer period of time than 1 year. This longer period allows for a greater aggregation of information on issues that are subject to wide annual fluctuations and for a more confident and meaningful estimate of the outcomes. The periodic indicators presented in this report are based on a reporting period of 4 years.

Periodic incidence and mortality indicators by location

Indicator 8: Incidence by location

Incidence rate of cervical cancer per 100,000 estimated resident female population in a 4-year period by location and 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years, age-standardised).

Indicator 9: Mortality by location

Death rate from cervical cancer per 100,000 estimated resident female population in a 4-year period by location and 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years, age-standardised).

Postcode and statistical local area information for incidence and mortality are routinely collected at the point of diagnosis or death. These data have been classified using the Rural, Remote and Metropolitan Areas classification (RRMA). This classification was developed in 1994 by the then Department of Primary Industries and Energy and the then Department of Human Services and Health as a framework by which various data sources could be analysed for metropolitan, rural and remote zones. The RRMA groups are classified according to Statistical Local Area based on the Australian Standard Geographical Classification (ASGC) version 2.1 (DPIE & DHSH 1994). Concordance algorithms have been developed to convert statistical local area information coded according to earlier and later ASGC versions into rural, remote and metropolitan area groupings.

Table 1: Structure of the Rural, Remote and Metropolitan Areas classification

Zone	Category
Metropolitan zone	Capital cities
	Other metropolitan areas (urban centre population > 100,000)
Rural zone	Large rural centres (urban centre population 25,000–99,999)
	Small rural centres (urban centre population 10,000–24,999)
	Other rural areas (urban centre population < 10,000)
Remote zone	Remote centres (urban centre population > 5,000)
	Other remote area (urban centre population < 5,000)

Source: DPIE & DHSH 1994.

Indicator 10: Indigenous mortality

Death rate from cervical cancer per 100,000 estimated resident female population in a 4-year period by Indigenous status and 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years, age-standardised).

This indicator examines the patterns of mortality among Indigenous women.

Identification of Indigenous status is still very fragmented and generally of poor quality in health data collections, and cervical screening data are no exception. Of the seven cervical screening indicators, only one indicator can be stratified by Indigenous status: mortality. Even for this, coverage is not complete. Only Western Australia, South Australia, the Northern Territory and Queensland are currently considered to have adequate coverage of Indigenous deaths in the registration of deaths. Therefore, only mortality data from these jurisdictions are analysed in this report.

Confidence intervals

Where indicators include a comparison between states and territories, between time periods, between geographic locations or between Indigenous and non-Indigenous women, a 95% confidence interval is presented with the rates. This is because the observed value of a rate may vary due to chance even where there is no variation in the underlying value of the rate. The 95% confidence interval represents a range over which variation in the observed rate is consistent with this chance variation. These confidence intervals can be used as an approximate test of whether changes in a particular rate are consistent with chance variation. Where the confidence intervals do not overlap, the change in a rate is greater than that which could be explained by chance. Where the intervals do overlap, then changes in the rate may be taken as approximately consistent with variability due to chance.

For example, the participation rate for Victoria in 1999–2000 was 66.2% with a confidence interval of 66.1% to 66.3%. The corresponding rate for 2000–2001 was 65.3% with a confidence interval of 65.2% to 65.4%. These two intervals do not overlap, so the difference between the 1999–2000 and 2000–2001 rates is larger than we would expect due to chance alone.

Another example is the comparison between cervical cancer mortality rates for women living in rural and remote areas. In the period 1997–2000 there were 2.4 cervical cancer deaths per 100,000 women living in rural areas. This rate had a confidence interval of 2.1 to 2.8. The corresponding rate for women in remote areas was 3.7 per 100,000, with a confidence interval of 2.2 to 5.4. These confidence intervals overlap, so despite the relatively large difference

between the two observed rates they are still consistent with chance variation. This arises from the fact that remote areas of Australia have small populations, which leads to small numbers of deaths from any specific cause, and these death rates may fluctuate from year to year over time. This in turn leads to relatively wide confidence intervals for an observed death rate.

It is important to note that this result does not imply that the difference between the two rates is definitely due to chance. Instead, an overlapping confidence interval represents a difference in rates which is too small to differentiate between a real difference and one which is due to chance variation.

Participation

The major objective of the National Cervical Screening Program is to reduce morbidity and deaths from cervical cancer by detecting treatable pre-cancerous lesions before their progression to cancer. Through increased participation, more women with pre-cancerous abnormalities can be detected and treated before progression to cervical cancer, thus reducing morbidity. In addition, increased participation will lead to the detection of more women with early stages of cancer where treatment can reduce mortality.

The program, through a variety of recruitment initiatives, actively targets women in the age group 20–69 years. The recommended screening interval for women in this target age group who have been sexually active at any stage in their lives is 2 years. Pap smears may cease at the age of 70 years for women who have had two normal Pap smears within the previous 5 years. Women over 70 years who have never had a Pap smear, or who request a Pap smear, are screened.

Some women in the target population are unlikely to require screening. They include:

- those who have had a total hysterectomy with their cervix removed;
- those who have never been sexually active;
- women with a previously diagnosed gynaecological cancer.

Participation rate calculations should, in principle, exclude all three groups from the data. In practice, the data are adjusted to remove women who have had a hysterectomy but the latter two groups cannot be excluded due to the lack of reliable data.

State and territory programs have strategic plans in place to increase participation of women in cervical screening. Such strategies include targeting priority population groups including Indigenous women, rural and remote women, and women from culturally and linguistically diverse backgrounds.

The objectives and usefulness of participation as an indicator are outlined below:

- The participation indicator measures the proportion of the target population covered by the cervical screening program and the current screening policy of a 2-year interval.
- The indicator is important in assessing the contribution of the cervical screening program to changes in incidence and mortality.
- The indicator can be used as a means of evaluating recruitment practices, particularly if participation rates are analysed by demographic characteristics.
- When this indicator is used in conjunction with others, it can be used to support analysis relating to target groups and screening intervals.

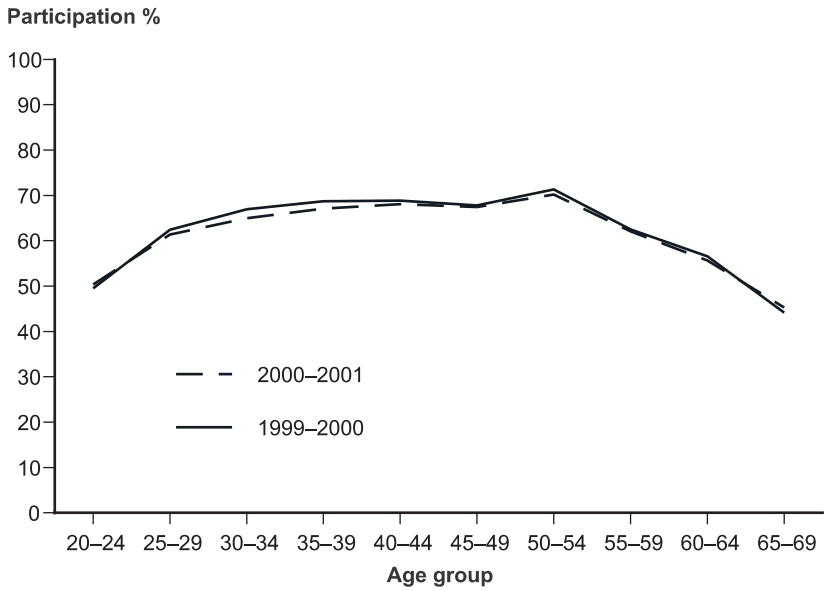
State and territory-specific issues

- Except for Victoria, Western Australia and the Australian Capital Territory, the participation rates are based on all women who were screened in a state or territory. This may lead to a small error in the estimation of numbers of women screened because of double counting of some women between states, difficulty in identifying state of residence for women in border areas, and inclusion of women resident overseas.
- Victorian rates for the two periods are not comparable because data provided for the 1999–2000 period include non-resident women; in the 2000–2001 period women were excluded if they were not Victorian residents.

Indicator 1: Participation rate for cervical screening

Percentage of women screened in a 24-month period by 5-year age groups (20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+) and for the target age group (20–69 years).

The graphs and tables below refer to the data for the target age group only. For detailed data refer to Tables 1b and 2b (pages 48 and 50).



Notes

1. Participation rates have been adjusted for the estimated proportion of women who have had a hysterectomy.
2. These data exclude women who have opted not to be on the register.

Source: AIHW analysis of state and territory Cervical Cytology Registry data.

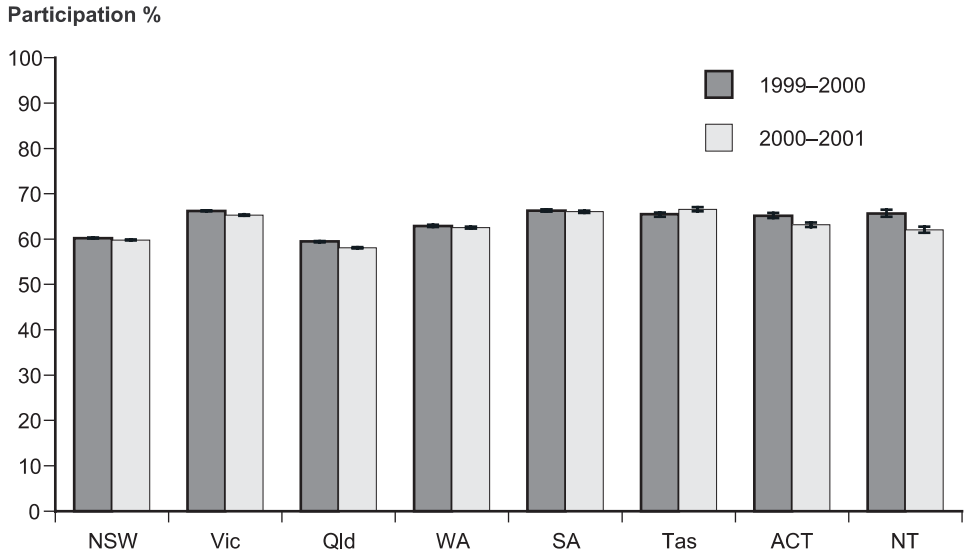
Figure 1: Participation rates in the National Cervical Screening Program by age group, Australia, 1999–2000 and 2000–2001

2-year period	Age group										
	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	20–69
	(Per cent)										
1999–2000	49.5	62.4	67.0	68.7	68.8	67.8	71.3	62.5	56.5	44.2	**62.6**
2000–2001	50.3	61.4	64.9	67.1	68.1	67.4	70.2	62.1	55.7	45.3	**61.8**

Note: Queensland data for the 1999–2000 period refer to the 2-year period from March 1999 to February 2001.

- The proportion of women in the target age group (20–69 years) participating in cervical screening fell from 62.6% in 1999–2000 to 61.8% in 2000–2001, a decline that is statistically significant (Table 2b, page 50).

- The total number of women screened by the National Cervical Screening Program in 2000–2001 was 3,331,408, an increase of 16,621 (0.5%) over the 1999–2000 reporting period for all ages. Of the total number screened in 2000–2001, 98% were from the target age group of 20–69 years (Table 2a, page 49).
- The age-specific participation rate was lower in 2000–2001 than in 1999–2000 in all age groups with the exception of the youngest and oldest age groups, 20–24 and 65–69 respectively (Tables 1b and 2b, pages 48 and 50).
- The age-specific participation rate was highest in the 50–54 age group with 70.2% of women screened compared with 45.3% in the 65–69 age group. As in the 1999–2000 reporting period, participation is highest in the age groups 35–39 to 50–54 but declines sharply thereafter as age increases (Tables 1b and 2b, pages 48 and 50).
- The age group with the largest difference in participation rates between the two periods was the 30–34 age group where the participation rate was 2.1 percentage points lower in 2000–2001 than in 1999–2000. Conversely, the age groups that experienced the least change in participation rates were the 45–49 and 55–59 age groups where there was only a difference of 0.4 percentage points in both groups (Tables 1a and 2a, pages 47 and 49).



Notes

1. Rates are expressed as the percentage of the eligible female population and age-standardised to the Australian 1991 population.
2. Queensland data for the 1999–2000 period refer to the 2-year period from March 1999 to February 2001.
3. Bars on graphs represent 95% confidence intervals.

Source: AIHW analysis of state and territory Cervical Cytology Registry data.

Figure 2: Participation (age-standardised) in the National Cervical Screening Program by women aged 20–69 years, states and territories, 1999–2000 and 2000–2001

2-year period/ rate	NSW	Vic[(b)]	Qld[(a)]	WA[(b)]	SA	Tas	ACT[(b)]	NT	Australia
1999–2000									
AS rate	60.2	66.2	59.5	62.8	66.2	65.5	65.1	65.6	62.6
95% CI	60.1–60.3	66.1–66.3	59.3–59.6	62.6–63.1	66.0–66.5	65.0–65.9	64.6–65.7	64.9–66.4	62.5–62.6
2000–2001									
AS rate	59.8	65.3	58.1	62.5	66.0	66.6	63.2	62.1	61.8
95% CI	59.7–59.9	65.2–65.4	57.9–58.2	62.3–62.7	65.8–66.3	66.1–67.0	62.6–63.7	61.4–62.7	61.8–61.9

(a) Queensland data for the 1999–2000 period refer to the 2-year period from March 1999 to February 2001.

(b) The Vic, WA and ACT registries register women with only a Vic, WA or ACT address respectively.

- The age-standardised participation rate for women screened in the target age group of 20–69 years in 2000–2001 ranged from 58.1% in Queensland to a high of 66.6% in Tasmania (Table 2b, page 50).
- When compared with the 1999–2000 rates, the rates are lower in all jurisdictions except Tasmania where there was a statistically significant increase from 65.5% to 66.6% in 2000–2001 (Tables 1b and 2b, pages 48 and 50). The rise in Tasmania was due, at least partially, to a television advertising campaign.

Early re-screening

The National Cervical Screening Program seeks to maximise reductions in incidence and mortality for cervical cancer. The design of the screening program defines two key parameters for achieving these objectives—target populations and screening intervals. Compliance with these parameters is crucial to maintaining the effectiveness of the program and cost efficiency in order that resources may be used to increase population coverage. For most women who have a negative smear, the recommended interval before their next screen is 2 years.

This indicator is defined as the repeating of a Pap smear within 21 months of a negative smear report. Reasons for the choice of 21 months as the time line for reporting are discussed under 'Data issues' below.

This indicator:

- tracks over a period of 21 months a cohort of women from all states and territories who had a negative smear result in February 2000 to determine the extent of early re-screening within the National Cervical Screening Program. The exception to this is Queensland where the index month is March. February was selected as the index month nationally because it has been shown to be a relatively stable month in terms of the number of women who are screened. This pattern has been consistent over a number of years, partly because fewer women take holidays at this time;
- measures the compliance with the recommended screening interval following a negative smear; and
- is important in assessing screening coverage around the recommended interval, as significant differences may reduce program effectiveness.

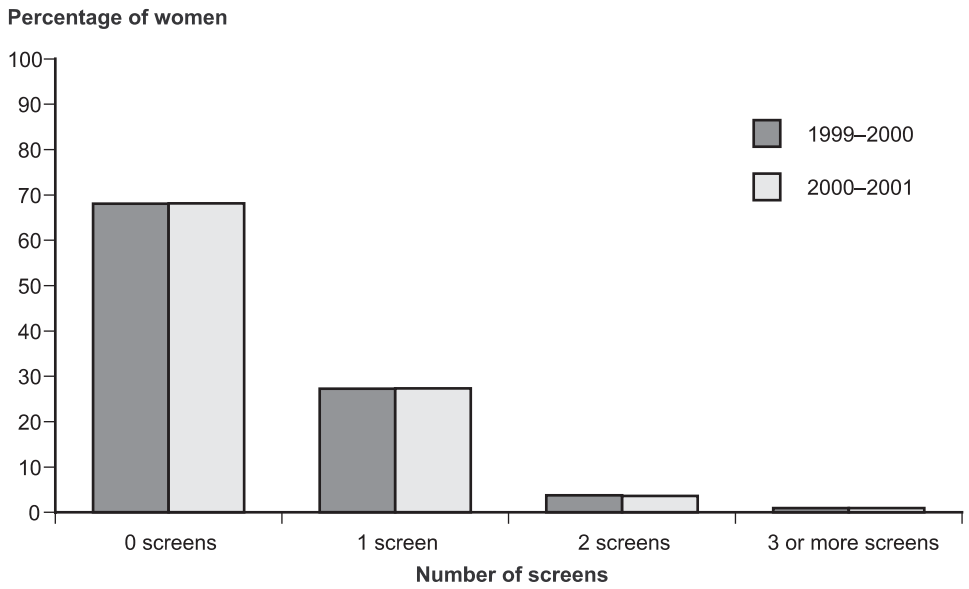
This indicator should be interpreted with caution as some early re-screening after a negative Pap smear report is appropriate and in accordance with the National Health and Medical Research Council (NHMRC) guidelines. Specifically, if a woman has a history of histologically proven high-grade abnormality, then annual screening is recommended. If a woman is being monitored after treatment or during the resolution phase of a low-grade abnormality, it is appropriate for her to be screened earlier than the 24 months interval.

Data issues

The data for Indicator 2 published in reports before the *Cervical Screening in Australia 1999–2000* report are not directly comparable with the data in this report as this indicator has been modified to change the follow-up period from 24 months to 21 months. This change has been made because women often have their Pap smear taken at a time convenient to them and are likely to have their biennial screening immediately before the 24-month anniversary. Also for some women, prescriptions for oral contraceptives lapse at 22 months and these women are then likely to combine their Pap smears with their visit to the GP for renewing their scripts for contraceptives.

Indicator 2: Early re-screening

Proportion of women re-screened by number of re-screens during a 21-month period following a negative Pap smear.



Refer to Table 4 (page 51).

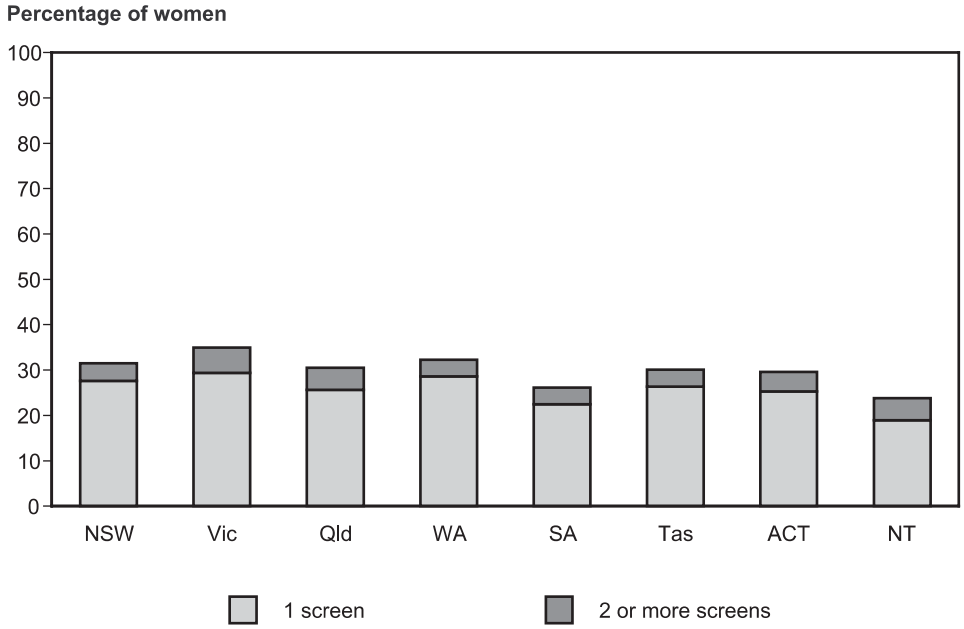
Note: The reference period for this indicator was the 21 months following the index month February 1999 and February 2000.

Source: AIHW analysis of state and territory Cervical Cytology Registry data.

Figure 3: Proportion of women re-screened by number of screens during the 21-month period following a negative Pap smear in February 2000, Australia

21-month period	0 screens	1 screen	2 screens	3+ screens
		(Per cent)		
Feb 1999–Nov 2000	68.0	27.3	3.8	0.9
Feb 2000–Nov 2001	68.1	27.3	3.6	0.9

- A cohort of 168,640 women screened in February 2000 whose smear results were negative were tracked over a 21-month period to measure the extent of early re-screening. When compared with the February 1999 cohort, very little difference was observed in the rate of re-screening women with a negative smear (Tables 3 and 4, page 51).
- Of this cohort, 32% were re-screened (4.5% of these were re-screened more than once) and 68% did not have any further screens in the 21-month period tracked (Table 4, page 51).



Refer to Table 4 (page 51).

Note: The reference period for this indicator was the 21 months following the index month February 2000.

Source: AIHW analysis of state and territory Cervical Cytology Registry data.

Figure 4: Proportion of women re-screened by number of screens during the 21-month period following a negative smear in February 2000, states and territories

No. of screens	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					(Per cent)				
0 screens	68.5	65.0	69.5	67.7	73.9	69.9	70.4	76.2	68.1
1 screen	27.6	29.4	25.6	28.6	22.4	26.4	25.3	18.9	27.3
2 or more	3.9	5.6	4.9	3.7	3.7	3.7	4.4	4.9	4.5

- Of the cohort of women screened in February 2000, over 70% of women whose smear results were negative in the Northern Territory, South Australia and the Australian Capital Territory did not have any further screens during the follow-up 21-month period (Table 4, page 51).
- The proportion of women having additional screens varied among the states and territories. For example, the Northern Territory experienced the lowest proportion of re-screens (23.8%) and the highest proportion was in Victoria (35.0%).

Low-grade abnormalities

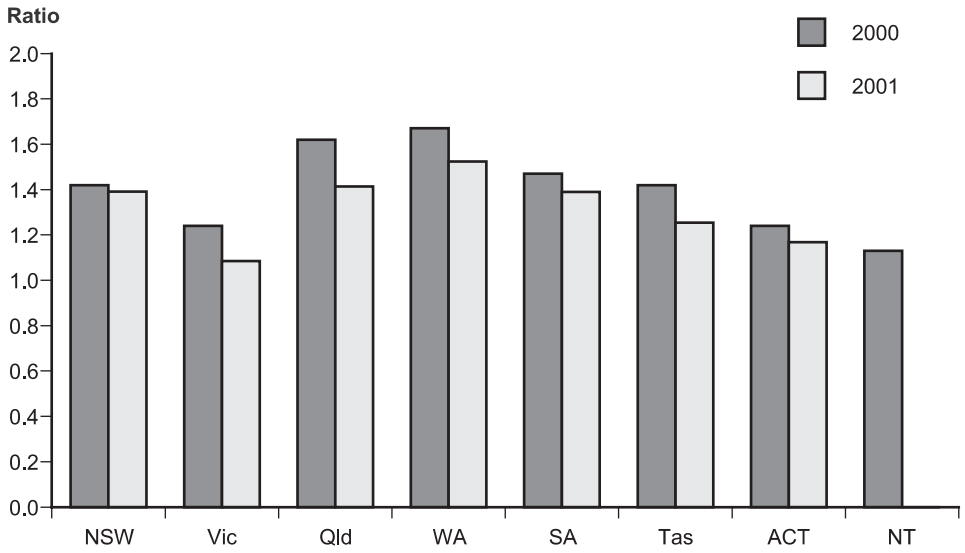
The Pap smear test is able to identify a range of abnormalities in cervical cells. Some of these abnormalities have a greater chance of becoming malignant (the so-called high-grade abnormalities), and are therefore treated aggressively. The chance of low-grade abnormalities progressing to malignant change is very much less.
In this report a low-grade intraepithelial abnormality includes:

- atypia;
- warty atypia (human papilloma virus (HPV) effect);
- possible cervical intraepithelial neoplasia (CIN) (see glossary);
- equivocal CIN;
- CIN 1; and
- endocervical dysplasia not otherwise specified (NOS).

The indicator is measured as the ratio of low-grade to high-grade intraepithelial abnormalities, all histologically verified.

Indicator 3: Low-grade abnormality detection

Ratio of number of women with a histologically verified low-grade intraepithelial abnormality detected in a 12-month period to the number of women with a histologically verified high-grade intraepithelial abnormality detected in the same period.



Refer to Tables 5a and 5b (page 52).

Note: Northern Territory data are not available for 2000–2001.

Source: AIHW analysis of state and territory Cervical Cytology Registry data.

Figure 5: Ratio of low- to high-grade abnormalities by women aged 20–69 years, states and territories, 2000 and 2001

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					(Ratio)				
2000	1.4	1.2	1.6	1.7	1.5	1.4	1.2	1.1	1.4
2001	1.4	1.1	1.4	1.5	1.4	1.3	1.2	..	1.3

.. not available.

- In 2001, the ratio of histologically confirmed low-grade intraepithelial abnormalities to high-grade intraepithelial abnormalities was lower in all states and territories than in 2000. A comparison cannot be made for the Northern Territory because data for 2001 are unavailable. (When the Northern Territory data were excluded from the all-Australia 2000 data for comparison purposes, the 2000 national ratio increased from 1.4 to 1.5) (Tables 5a and 5b, page 52).
- The ratio of low-grade to high-grade abnormalities in 2001 ranged from 1.1 in Victoria to 1.5 in Western Australia.