National cervical screening monitoring indicators

This report monitors the performance of the National Cervical Screening Program using 10 indicators. Indicators are used as summary measures of 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 assist in the evaluation of 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. The National Advisory Committee and state and territory cervical screening programs have endorsed these indicators. 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+) 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 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).

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 allows 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 geographic location[1] 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 geographic location[1] 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 is 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

[1] See Table A for location classified by RRMA.

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 A: Structure of the Rural, Remote and Metropolitan Areas classification

Zone	Category
Metropolitan zone	Capital cities
	Other metropolitan centres (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, mortality data from these jurisdictions only 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 (CI) is presented along 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 provides a probability that the difference is not due to chance. Where the confidence intervals do not overlap, there is at least 95% confidence that the change in a rate is greater than that which could be explained by chance. Where the intervals do overlap, then there is not a 95% confidence that changes in the rate are due to chance.

For example, the participation rate for New South Wales in 1998–1999 was 60.8% with a confidence interval of 60.7% to 60.9%. The corresponding rate for 1999–2000 was 60.2% with a confidence interval of 60.1% to 60.3%. These two intervals do not overlap, so there is at least 95% confidence that the difference between the 1998–1999 and 1999–2000 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 to 2000 there were 2.4 cervical cancer deaths per 100,000 women living in rural areas. This rate had a confidence interval of 2.2 to 2.6. The corresponding rate for women in remote areas was 3.7 per 100,000 women, 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 there is less than 95% probability that these differences are not caused by chance. 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 small numbers 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 to women. 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 the target age group 20–69 years who have ever 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 last 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; and
- women with a previously diagnosed gynaecological cancer (this last group is monitored under a clinical arrangement) (Snider & Beauvais 1998).

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 methodological difficulties.

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 objective, measurement and usefulness of participation as an indicator is 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-yearly interval.
- This 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.
- The data presented for this indicator refer to the 2-year period 1999–2000. Data for the period 1998–1999 are also included for comparison.

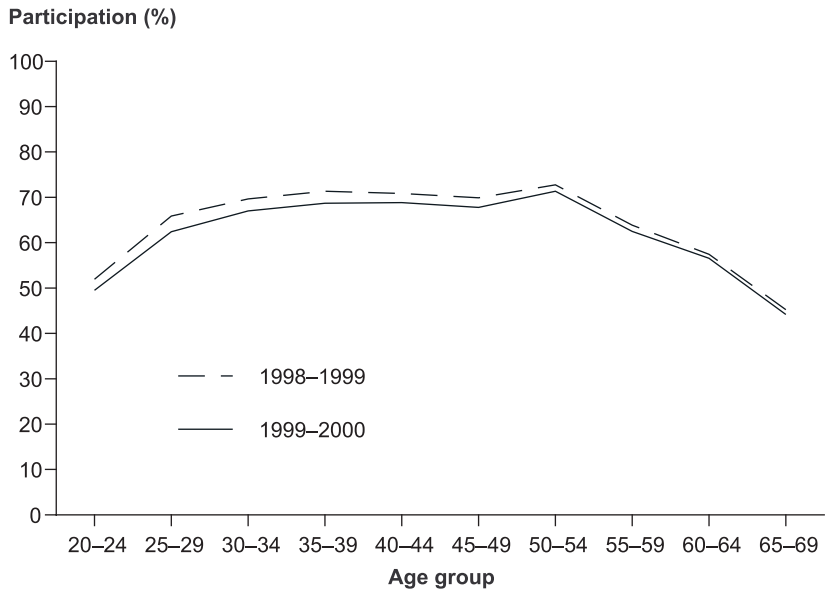
State- and territory-specific issues

- Except for Western Australia and the Australian Capital Territory, the participation rates are based on all women who were screened in that state or territory. This may lead to an over-estimation of numbers of women screened because of double counting of some women between states. This may be the result of difficulty in identifying state of residence for women in border areas and inclusion of women resident overseas.
- The reference period for this indicator is from 1 January 1999 to 31 December 2000. Queensland data, however, refer to the 2-year period from March 1999 to February 2001. This is because the Queensland Pap Smear Register began in February 1999 and therefore no data are available for the earlier period.

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 132 and 134).



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.

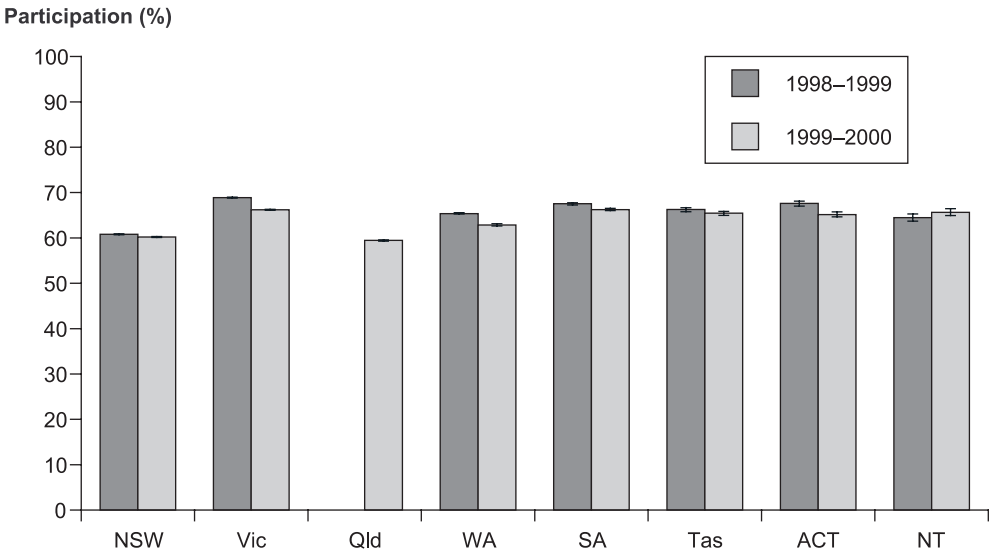
Figure 1: Participation rates in the National Cervical Screening Program, by age group, Australia, 1998–1999 and 1999–2000

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)										
1998–1999	52.0	66.0	69.7	71.4	70.9	69.9	72.8	63.9	57.4	45.2	**64.8**
1999–2000	49.5	62.4	67.0	68.7	68.8	67.8	71.3	62.5	56.5	44.2	**62.6**

Notes

1. The Queensland register began in February 1999; therefore no data were available for the 1998–1999 period.
2. Queensland data for the 1999–2000 period refer to the 2-year period from March 1999 to February 2001.

- In 1999–2000, 62.6% of women in the target age group 20–69 years participated in cervical screening. The proportion of women participating in screening has declined significantly between the two periods 1998–1999 and 1999–2000. Excluding Queensland data which were not included in 1998–1999 the proportion of women who participated in screening was 63.3% in 1999–2000, a statistically significant decline from 64.8% in 1998–1999.
- The total number of women screened in Australia in 1999–2000 was 3,314,787, of whom 3,244,329 (98%) were in the target age range of 20–69 years (Table 2a, page 133).
- Participation in screening is highest at the age groups 35–39 to 50–54 but declines sharply from the age group 55–59.
- Between the two reporting periods, the age-specific participation rates declined in all age groups. This decline was greatest at younger ages. Screening rates for women aged 25–29 years decreased from 66.0% to 62.4% and for women aged 20–24 years from 52.0% to 49.5%.



Notes

1. Rates are expressed as the percentage of the eligible female population and age-standardised to the Australian 1991 population.
2. No data were available for Queensland for the period 1998–1999 as the Queensland register began in February 1999.
3. Queensland data for the 1999–2000 period refer to the 2-year period from March 1999 to February 2001.
4. 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, 1998–1999 and 1999–2000

2-year period/ rate	NSW	Vic	Qld[a]	WA[b]	SA	Tas	ACT[b]	NT	Australia
1998–1999									
AS rate	60.8	68.9	n.a.	65.4	67.6	66.3	67.6	64.5	64.8
95% CI	60.7–60.9	68.8–69.0	n.a.	65.1–65.6	67.3–67.8	65.8–66.7	67.0–68.1	63.7–65.3	64.8–64.9
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

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

(b) The WA and ACT Registries only register women with a valid WA or ACT address respectively.

- In 1999–2000, the proportion of women screened in the target age group of 20–69 years in states and territories varied from a high of 66.2% in Victoria and South Australia to a low of 59.5% in Queensland.
- Compared to 1998–1999, all jurisdictions except the Northern Territory experienced a decreased rate of participation in 1999–2000. The rate of decline was statistically significant in New South Wales, Victoria, Western Australia, South Australia and the Australian Capital Territory. Queensland had no data for the period 1998–1999.
- The Northern Territory registered an increased participation rate in the target age group, but the increase is not statistically significant.
- All registers except those in Western Australia and the Australian Capital Territory keep records of Pap smears for women screened in their jurisdiction but who live outside that jurisdiction. The largest proportion of interstate women recorded for 1999–2000 was in New South Wales (0.9% of all women screened in the state).

Early re-screening

The National Cervical Screening Program seeks to maximise reductions in incidence of and mortality from cervical cancer. The design of the screening program defines two key parameters to achieve these objectives—target populations and screening intervals. Compliance with these parameters is crucial in maintaining the effectiveness of the program and in maintaining 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.

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 1999, 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.

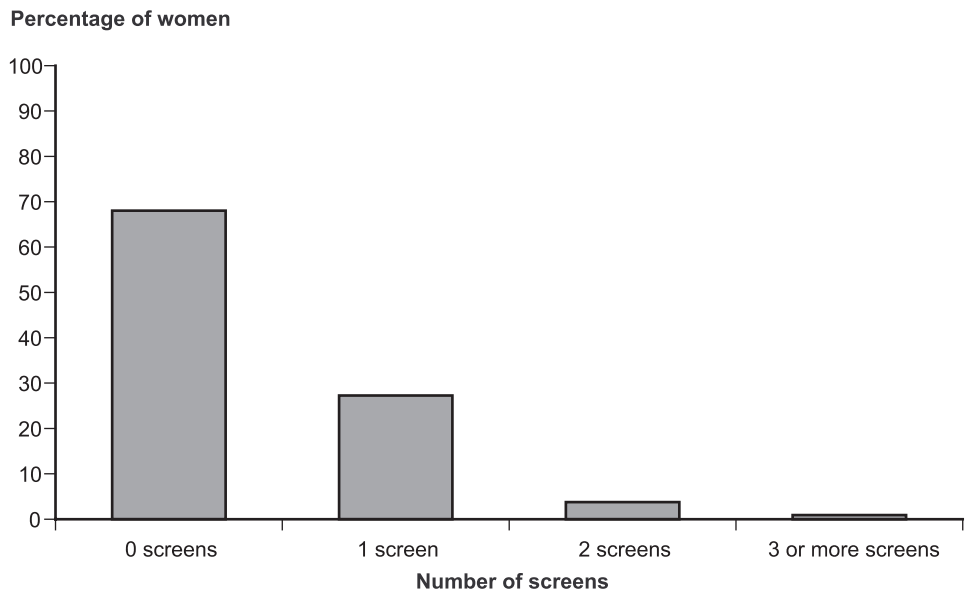
This indicator should be interpreted with caution as some early re-screening after a negative Pap smear report is appropriate and in accordance with the National Health and Medical Research Council (NHMRC) guidelines. Specifically, if a woman has a history of histologically proven high-grade abnormality, 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 published in previous reports for Indicator 2, early re-screening, 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 the women are then likely to combine their Pap smears at 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 smear.



Refer to Table 4 (p. 135).

Note: The reference period for this indicator was the 21 months following the index month February 1999. For Queensland the index month was March 1999.

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

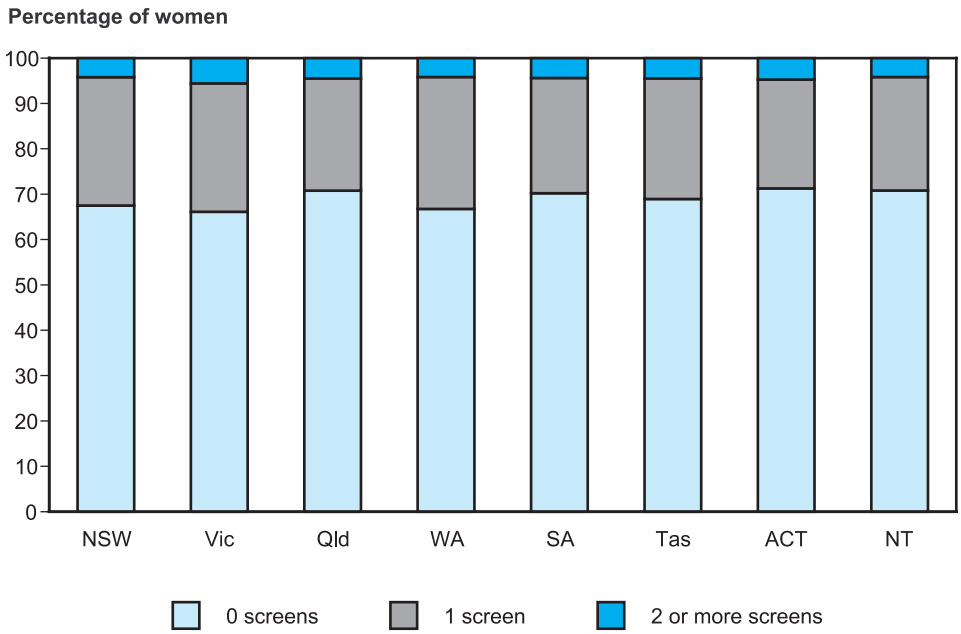
Figure 3: Proportion of women re-screened, by number of screens during the 21-month period following a negative smear in February 1999, Australia

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

Note: Previously published data for this indicator refer to a cohort of women followed up for a period of 24 months. Therefore, the data published in previous reports are not directly comparable to the data published here.

This indicator, early re-screening, tracked over a period of 21 months a cohort of 175,723 Australian women who had a negative smear result in the index month to ascertain how many of them had early repeat screens.

- Of these women 68% were not re-screened in the follow-up period, 27% had one additional screening, 3.9% two additional screenings and less than 1% had 3 or more additional screenings.



Refer to Table 4 (p. 135).

Note: The reference period for this indicator was the 21 months following the index month February 1999. For Queensland the index month was March 1999.

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 1999, states and territories

No. of screens	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					(Per cent)				
0 screens	67.5	66.1	70.8	66.8	70.2	68.9	71.3	70.8	68.0
1 screen	28.3	28.3	24.7	29.1	25.4	26.6	24.0	25.0	27.3
2 or more	4.2	5.6	4.5	4.2	4.5	4.4	4.7	4.2	4.7

- Over 70% of the women in Queensland, South Australia, the Australian Capital Territory and the Northern Territory who had a negative Pap smear result in the index month had no additional screenings during the follow-up period of 21 months.
- The lowest proportion of women who had additional smears was in the Australian Capital Territory (28.7%) and the highest was in Victoria (33.9%).

Low-grade abnormalities

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

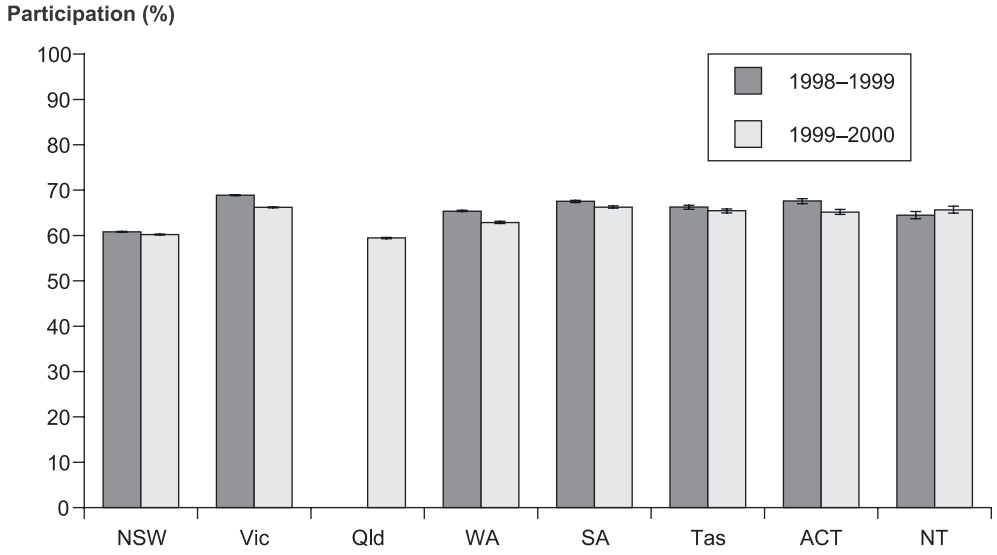
In this report a low-grade intraepithelial abnormality includes:

- 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 histologically verified low-grade intraepithelial abnormalities detected to histologically verified high-grade intraepithelial abnormalities.

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.



Refer to Tables 5a and 5b (p. 136).

Note: Data for Queensland were incomplete for 1999 as the Queensland register began in February 1999.

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, 1999 and 2000

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
					(Ratio)				
1999	1.4	1.2	n.a.	1.7	1.4	1.4	1.2	0.9	1.4
2000	1.4	1.2	1.6	1.7	1.5	1.4	1.2	1.1	1.4

- The ratio of histologically confirmed low-grade intraepithelial abnormalities to high-grade intraepithelial abnormalities in Australia in 2000 was 1.4, which was the same as for 1999 (1.4). Excluding Queensland from the 2000 data for a valid comparison, the ratio still remains at 1.4.
- The ratio of low-grade to high-grade abnormalities in 2000 varied from 1.1 in the Northern Territory to 1.7 in Western Australia. The younger age structure of the female population in the Northern Territory is partly responsible for this result as the rate of high-grade abnormalities found is much higher in women less than 35 years of age (see Indicator 4).

- Between the two periods 1999 and 2000, the ratios of low-grade to high-grade abnormalities increased in South Australia, and in the Northern Territory. In the Northern Territory, in 1999, there were more cases of high-grade than low-grade abnormalities detected but the reverse was true in 2000.