Cervical Cytology Registry (CCR) of Western Australia

2001 Statistical Report

WA Cervical Cancer Prevention Program

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1. Background

The Western Australian Cervical Cancer Prevention Program (WACCPP) was established in 1992 as part of the *Organised Approach to Prevention of Cancer of the Cervix,* now the National Cervical Screening Program.

The Cervical Cytology Registry (CCR) is an integral component of the Program. It compiles and maintains the Register - a central database of Pap smear and cervical biopsy test results from women resident in WA at the time of their Pap smear. The CCR has been operational since late 1994.

Participation in the Register is voluntary and the confidentiality of data held is governed by legislation. Service providers are encouraged to inform women about the CCR and if the woman does not object, the pathology laboratory routinely forwards her Pap smear results (together with basic identifying information) to the CCR. The quality of information received by the CCR is dependent on all laboratories providing accurate data by electronic transmission.

As of 31 December 2001, there were approximately 1.9 million records (including all smears and biopsies) in the Register. Provision is made for women to remove their name from the Register at any time by contacting the CCR. Seventeen women were withdrawn from the Register at their request in 2001.

The CCR has produced statistical reports since 1996. The data presented in this report refers to the 2001 calendar year unless otherwise specified.

2. Functions of the CCR

- To act as a 'safety net', providing a reminder to women and medical practitioners when Pap smears and other cervical investigations are overdue.
- To provide a linked record of women's previous smears in order to assist pathologists and cytologists in the reporting of current smear results, and to assist clinicians in the management of abnormalities detected in the screening process.
- To provide feedback to pathology laboratories about cytology and histopathology results to assist with quality control.
- To provide epidemiological data to enable monitoring of participation rates in cervical screening and trends in abnormalities.
- To provide data for use in approved research into cervical cancer, its alleviation and prevention.
- To contribute to the policy requirements of the National Pathology Accreditation Advisory Council (NPAAC) and the National Cervical Screening Program (NCSP).
- To assist with planning and evaluation of recruitment strategies for the WACCPP.

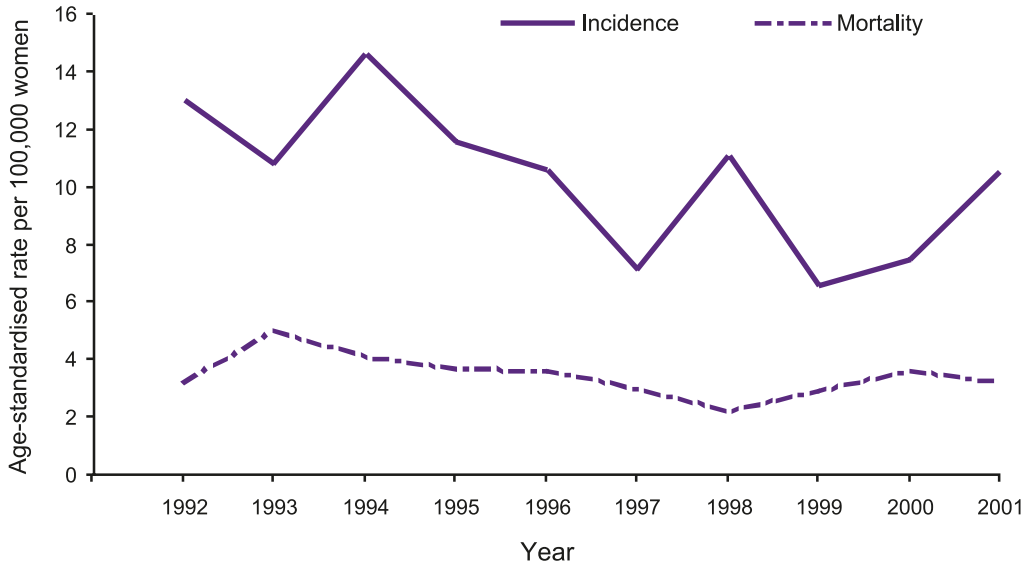
3. Cervical cancer in WA

The aim of the WACCPP is to improve the health and well-being of Western Australian women by reducing incidence and mortality from cervical cancer through the implementation of population based cervical screening strategies.

As seen in Figure 3.1 there has been a general decline in the incidence rate of cervical cancer over the past ten years (1992-2001). The peak seen in 1998 coincided with a national media campaign conducted in the same year, which effectively increased the number of women participating in cervical screening. The declining incidence rate apparent in 1999 corresponded with a decline in women screened in the same period. By contrast, the ascending rate of incidence in 2001 accompanied the lowest number of participants screened since 1996 (see Table 4.1). Caution should be exercised when interpreting these results as there are many factors contributing to the observed incidence rates of cervical cancer.

The cervical cancer mortality rate decreased from a high point of 5.0 per 100,000 women (37 deaths) in 1993 to a low point of 2.2 per 100,000 women (20 deaths) in 1998. In 2001, this rate was 3.2 per 100,000 women (30 deaths).

Figure 3.1 Age-standardised cervical cancer incidence and mortality rates WA 1992-2001

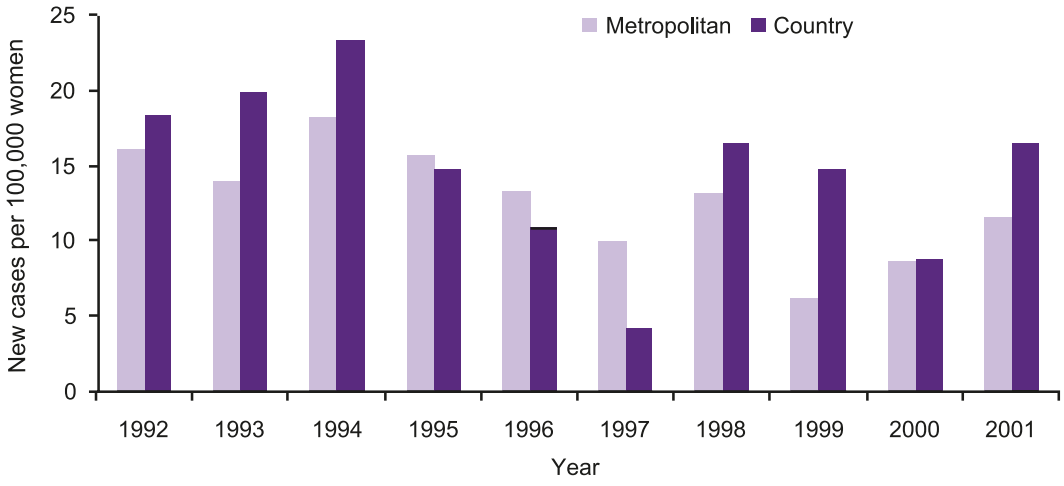


Note: Rates are expressed per 100,000 women and age-standardised to the Australian 2001 population.

Source: WA Cancer Registry, Department of Health WA (unpublished data current as at July 2003).

Figure 3.2 indicates women from country areas generally experienced higher incidence rates of cervical cancer than their metropolitan counterparts. The large fluctuations over the years may reflect small numbers of cases.

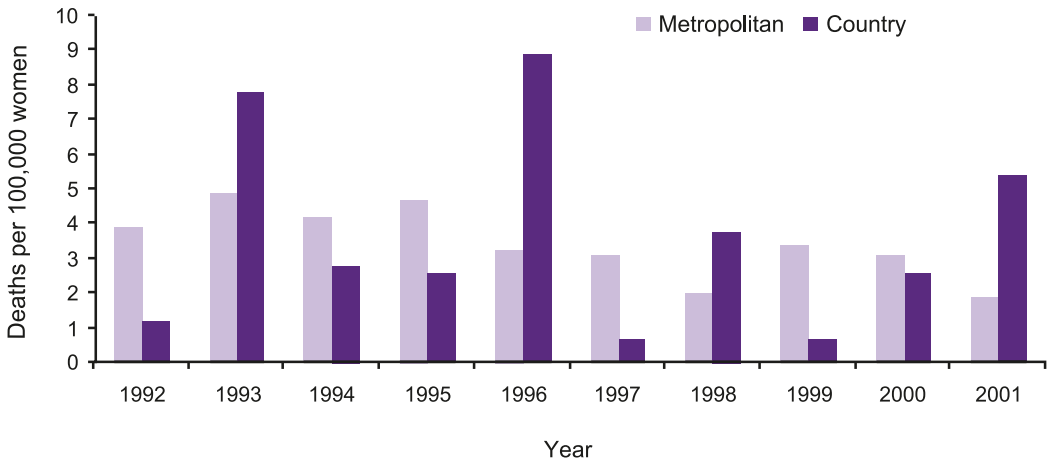
Figure 3.2 Age-standardised incidence rates of cervical cancer in women aged 20-69 years (metropolitan and country areas of WA) 1992-2001



Note: Rates are expressed per 100,000 women and age-standardised to the Australian 2001 population.
Source: WA Cancer Registry, Department of Health WA (unpublished data current as at July 2003).

Mortality rates from cervical cancer for both metropolitan and country target populations have generally declined over the past decade. The apparent marked fluctuations in mortality in country women probably reflect small numbers of cases.

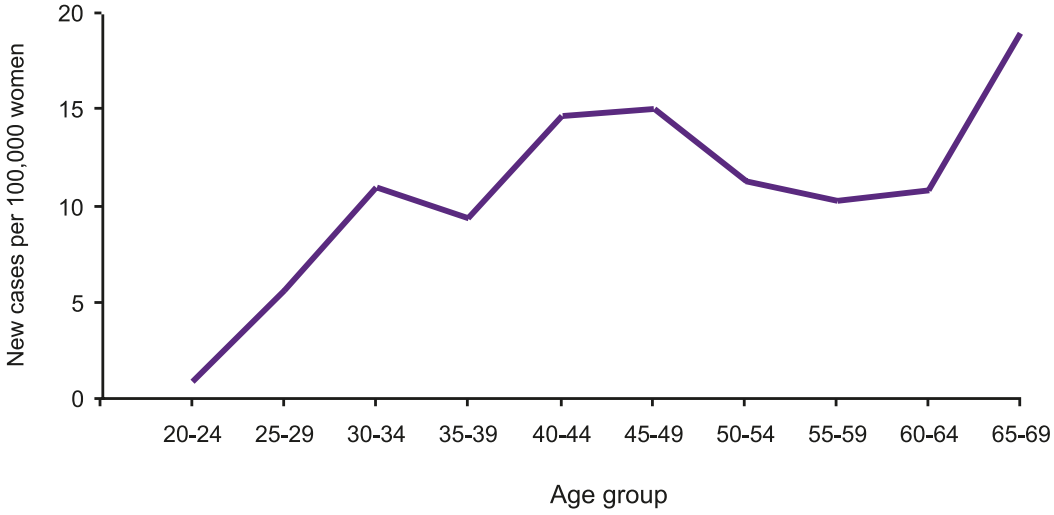
Figure 3.3 Age-standardised mortality rates from cervical cancer in women aged 20-69 years (metropolitan and country areas of WA) 1992-2001



Note: Rates are expressed per 100,000 women and age-standardised to the Australian 2001 population.
Source: WA Cancer Registry, Department of Health WA (unpublished data current as at July 2003).

From Figure 3.4 it is evident that the incidence rate of cervical cancer was higher among women aged 40-49 years and also women in the 65-69 years age group during 1997-2001.

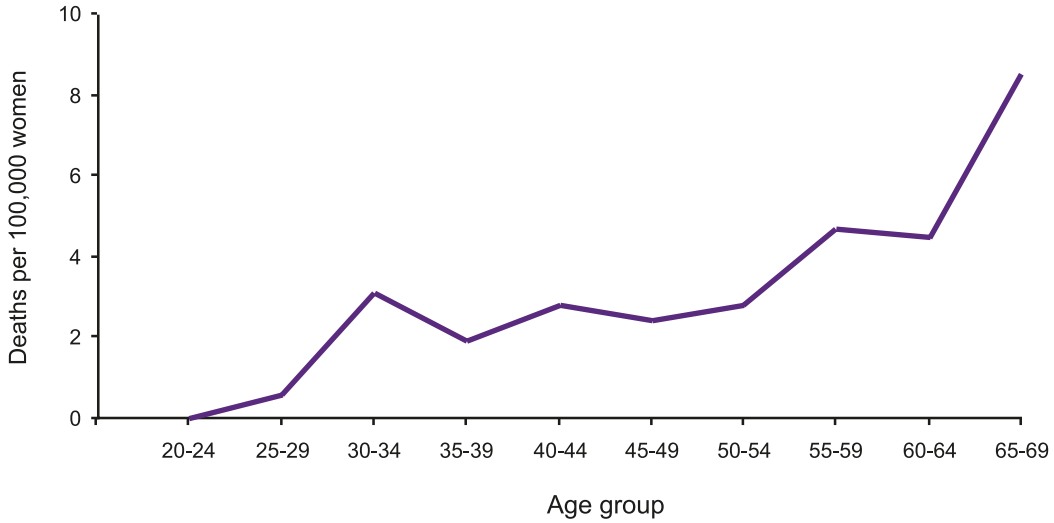
Figure 3.4 Age-specific incidence rates of cervical cancer in women aged 20-69 years WA 1997-2001



Note: Rates are expressed per 100,000 women.
Source: WA Cancer Registry, Department of Health WA (unpublished data current as at October 2003).

Figure 3.5 shows a high mortality rate for women aged 65-69 years. In a declining population of women over the age of 40 years, this age group accounts for 13 deaths (8.5 per 100,000 women).

Figure 3.5 Age-specific cervical cancer mortality rates in women aged 20-69 years WA 1997-2001



Note: Rates are expressed per 100,000 women.
Source: WA Cancer Registry, Department of Health WA (unpublished data current as at October 2003).

In WA, cervical cancer incidence rates were 1.5 times higher and mortality rates 3.5 times higher for Indigenous women compared with non-Indigenous women, for the years 1992-2001[1].

[1] WA Cancer Registry, Department of Health WA (unpublished data current as at July 2003).

4. Participation

The *National Policy on Screening to Prevent Cancer of the Cervix (1991)* provides consensus guidelines on women who require screening and how often Pap smears should be taken. It states:

*Routine screening with Pap smears should be carried out every **two** years for women who have no symptoms or history suggestive of cervical pathology.*

All women who have ever been sexually active should commence having Pap smears between the ages of 18 to 20 years, or one or two years after first sexual intercourse, whichever is later. In some cases, it may be appropriate to start screening before 18 years of age.

Pap smears may cease at the age of 70 years for women who have had two normal Pap smears within the last five years. Women over 70 years who have never had a Pap smear, or who request a Pap smear, should be screened.

This policy only applies to women without symptoms that could be due to cervical pathology. Women with a past history of high-grade cervical lesions, or who are being followed-up for a previous abnormal smear, should be managed in accordance with the National Health and Medical Research Council (NHMRC) guidelines[2].

4.1 Number of tests and women screened per year

A total of 204,387 cytology tests were performed in 2001 with 193,830 women screened during the year (Table 4.1).

Table 4.1 Number of tests performed and the number of individual women screened 1995-2001

Year	Number of tests performed	Number of women screened
1995	200,450	184,180
1996	208,138	192,792
1997	209,322	195,014
1998	222,990	209,802
1999	208,286	196,380
2000	208,526	197,501
2001	204,387	193,830

Note: Includes all women with an address in WA at the time of the Pap smear. Excludes women's records after the date of hysterectomy or from the initial vault smear, i.e. post-hysterectomy.

During the 1995-2001 period the number of Pap smears performed and the number of women screened saw a steady increase, peaking in 1998, followed by a general decline to 2001. The peak shown in 1998 may be attributed to the national media campaign conducted over that period. The ensuing annual numbers however, highlight difficulties around sustaining and increasing screening figures within a growing population.

2 *Guidelines for the Management of Women with Screen Detected Abnormalities,* National Health and Medical Research Council (NHMRC) 1994, reprinted 1995.

Several factors influence the number of tests performed. For example, the data should reflect the number of women who do not object to having their results forwarded to the CCR. Women who choose not to have their results available to the CCR (opt off) are omitted from these figures. These data are dependent on medical and laboratory data management and transmission to the CCR.

It must be acknowledged that there are likely to be minor inaccuracies in the number of women screened due to incomplete record linkage, as there is no unique identifier for each woman available to the CCR at this time.

4.2 Proportion of target population screened

The denominators for the following percentages are based on the Australian Bureau of Statistics (ABS) *Estimated Resident Population (ERP) - Female - by Statistical Local Areas (SLA) in WA by five-year age groups*. These are adjusted for hysterectomy using ABS *1995 National Health Survey* for 1996 ERP and ABS *2001 National Health Survey* for 1997-2001 ERP (1997-2000 ERP have been revised based on the 2001 census). The proportion of women screened in the two-year periods (1996-97, 1997-98, 1998-99, 1999-2000 and 2000-01) was calculated using an average of ERP data for each of the two years concerned.

Traditionally, WA rates have compared favourably with national cervical screening participation rates. During the 1996-97 period 62.4% of women aged 20-69 had been screened nationally compared with 63.0% of women in WA. In the 2000-01 period 60.7% of women were screened nationally compared with 61.7% of women in WA.

Figure 4.1 Estimated percentage of women with an intact uterus who had at least one Pap smear for the two-year periods 1996-97, 1997-98, 1998-99, 1999-2000 and 2000-01: comparison of WA with Australia

Note: Includes all women aged between 20 and 69 years with an address in WA at the time of the Pap smear.

Source: National figures - Australian Institute of Health and Welfare (AIHW) Cervical Screening in Australia 1997-98, 1998-99, 1999-2000 and unpublished data 2001-02.

In keeping with the results seen in the number of women screened (Table 4.1)[3], the 1997-98 period witnessed a peak in the rate of participation of WA women in the target age group (20-69 years) corresponding with the 1998 National Media Campaign (Table 4.2). This was followed by a steady decline to the 2000-01 period where the participation rate fell below the 1996-97 period (a decrease of 1.4% over the entire study period).

The overall participation rates for cervical screening amongst women aged 20-69 have remained relatively stable over the 1999-2000 and 2000-01 periods, however there has been a generally declining trend in younger women and a generally increasing trend among older women across the entire study period (1996-97 to 2000-01). While participation rates among older women (50 years and over) show improvement, the participation rate of women aged 60-69 years has remained low (51.1%). This older group is a major focus of the Program's Primary Recruitment Strategy, which commenced in June 1999.

The decline in the rate of participation among women under the age of 30 years seen in the 1999-2000 period has continued in the 2000-01 period. This has led to the inclusion of this group as a high priority for the strategies developed by the Recruitment Program from 2003 onwards.

Fluctuations in participation rates over time may be influenced by the implementation of improvements in record linkage procedures in the CCR. These allow more accurate tracking of individual screening participants over time and may lead to an apparent decrease in recorded participation rates.

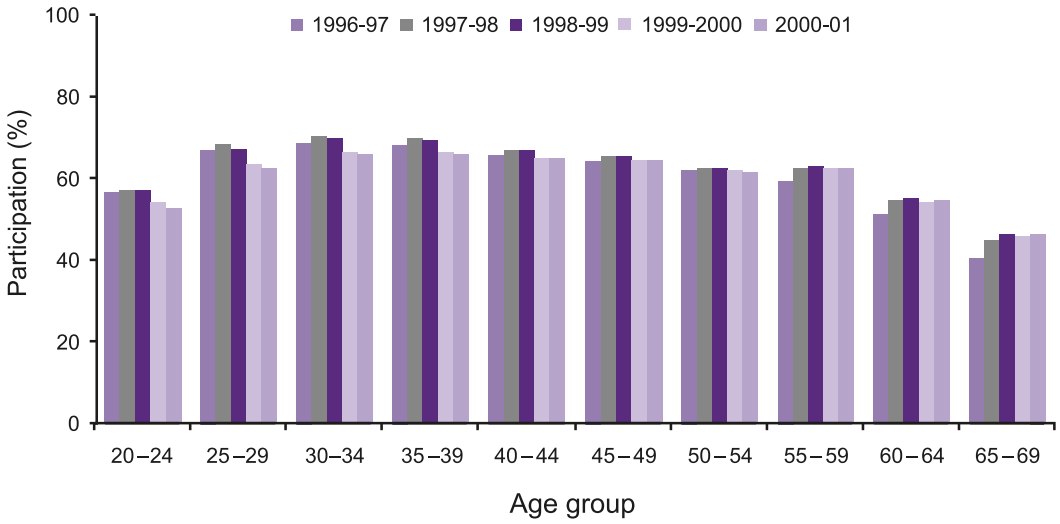
Table 4.2 Estimated percentage of women with an intact uterus who had at least one Pap smear for the two-year periods 1996-97, 1997-98, 1998-99, 1999-2000 and 2000-01

Age group	% women screened					% change from 1996-97 to 2000-01
	1996-97	1997-98	1998-99	1999-2000	2000-01	
20–24	56.4	57.0	57.2	54.0	52.9	-3.5
25–29	67.1	68.1	67.3	63.4	62.6	-4.6
30–34	69.0	70.4	69.9	66.5	65.8	-3.2
35–39	68.1	69.7	69.1	66.4	66.0	-2.1
40–44	65.8	66.7	66.7	64.9	64.8	-1.0
45–49	64.2	65.2	65.2	64.2	64.3	0.1
50–54	62.6	62.3	62.3	61.9	61.7	-1.0
55–59	59.3	62.7	62.9	62.2	62.6	3.3
60–64	51.4	54.4	55.1	54.4	54.8	3.5
65–69	40.5	44.7	46.4	45.8	46.5	6.0
20–69	**63.0**	**64.4**	**64.3**	**62.0**	**61.7**	**-1.4**

Note: Includes all women aged between 20 and 69 years, with an address in WA at the time of the Pap smear.

[3] Slight variation from previous Statistical Reports in the proportion of women screened is due to population adjustments, system enhancements and standardisation of reporting parameters, i.e. exclusion of women who appear to have had a hysterectomy.

Figure 4.2 Estimated percentage of women with an intact uterus who had at least one Pap smear for the two-year periods 1996-97, 1997-98, 1998-99, 1999-2000 and 2000-01



The following table shows the estimated percentage of eligible women who had at least one Pap smear during a two-year period compared with a three-year period.

Table 4.3 Estimated percentage of women with an intact uterus who had at least one Pap smear for the two-year period 2000-01 and the three-year period 1999-2001

Age group	% women screened	
	2000–01	1999–2001
20–24	52.9	68.8
25–29	62.6	79.0
30–34	65.8	80.5
35–39	66.0	79.7
40–44	64.8	77.0
45–49	64.3	75.3
50–54	61.7	71.1
55–59	62.6	71.0
60–64	54.8	62.4
65–69	46.5	53.2
20–69	**61.7**	**74.4**

Note: Includes all women aged between 20 and 69 years, with an address in WA at the time of the Pap smear.

Policies for screening intervals vary internationally. Australian policy advises a two-year screening interval for women who have had a negative Pap smear[4]. While discussion continues around the length of screening intervals required to maximise early detection, there is a recognised need for development of systems to identify and actively target two important groups. They consist of

4 *Guidelines for the Management of Women with Screen Detected Abnormalities,* National Health and Medical Research Council (NHMRC) 1994, reprinted 1995.

women who have never been screened and women who have not been screened for more than four years (underscreened). Implementation of the 2001 Federal Cervical Screening Budget Initiative, which builds on the existing Practice Incentives Program, has attempted to address this issue through Incentives for general practitioners who screen women in these groups.

It can be seen from Table 4.3 that a high proportion of women aged 25 to 60 years were screened at least once in the three-year period 1999-2001. This is consistent with previous years. Women over 60 years of age have a low level of participation over both the two-year and three-year periods.

4.3 Comparison of metropolitan and country participation

Table 4.4 compares the screening coverage for women living in the Perth metropolitan area with those living in country WA.

The denominators for these percentages are as previously described in Section 4.2. Classification as metropolitan or country was based on information provided by the Health Information Centre, Department of Health WA[5].

The table shows that for all five time-periods, the proportion of women aged 20-69 years living in country WA who had been screened within two years was lower than for women living in the Perth metropolitan area. This trend appears to be widening (with a 2.6% difference in the participation rate during 1997-98 and a 3.7% difference in the rate of participation during 2000-01).

The exception to this was women in the 20-24 years age group, who experienced a higher rate of cervical screening participation in country areas in all five periods of time.

[5] Postcode Allocation, Epidemiology, Health Information Centre, Department of Health WA

Table 4.4 **Estimated percentage of women with an intact uterus who had at least one Pap smear for the two-year periods 1996-97, 1997-98, 1998-99, 1999-2000 and 2000-01: comparison of the Perth metropolitan area with country WA**

Age group		% women screened				
		1996-97	1997-98	1998-99	1999-2000	2000-01
20–24	Metro	55.8	56.3	56.5	53.5	52.6
	Country	58.6	59.9	59.9	55.9	54.3
25–29	Metro	67.9	68.6	68.0	64.1	63.4
	Country	64.4	66.1	64.9	60.5	59.5
30–34	Metro	70.1	71.3	71.0	67.7	66.9
	Country	65.1	67.1	66.1	62.4	62.1
35–39	Metro	69.2	70.5	69.9	67.1	67.1
	Country	64.2	66.5	66.1	63.6	62.2
40–44	Metro	67.0	67.8	67.7	65.9	65.6
	Country	60.9	62.1	62.4	61.0	61.4
45–49	Metro	65.2	66.3	66.7	65.6	65.8
	Country	60.2	60.8	59.3	58.6	58.4
50–54	Metro	63.8	63.4	63.5	63.3	62.9
	Country	57.9	57.8	57.4	56.5	56.4
55–59	Metro	59.9	63.4	63.9	63.2	63.4
	Country	57.1	59.7	58.9	58.5	59.3
60–64	Metro	51.3	54.5	55.5	54.7	55.2
	Country	51.3	53.5	53.5	53.0	53.2
65–69	Metro	41.0	45.0	46.8	46.2	47.0
	Country	38.5	43.4	45.0	43.9	44.4
20–69	**Metro**	**63.6**	**64.9**	**64.9**	**62.7**	**62.4**
	Country	**60.6**	**62.3**	**61.7**	**59.2**	**58.7**

Note: Includes all women aged between 20 and 69 years, with an address in WA at the time of the Pap smear.

Figure 4.3 **Estimated percentage of women with an intact uterus who had at least one Pap smear for the two-year period 2000-01: comparison of the Perth metropolitan area with country WA**

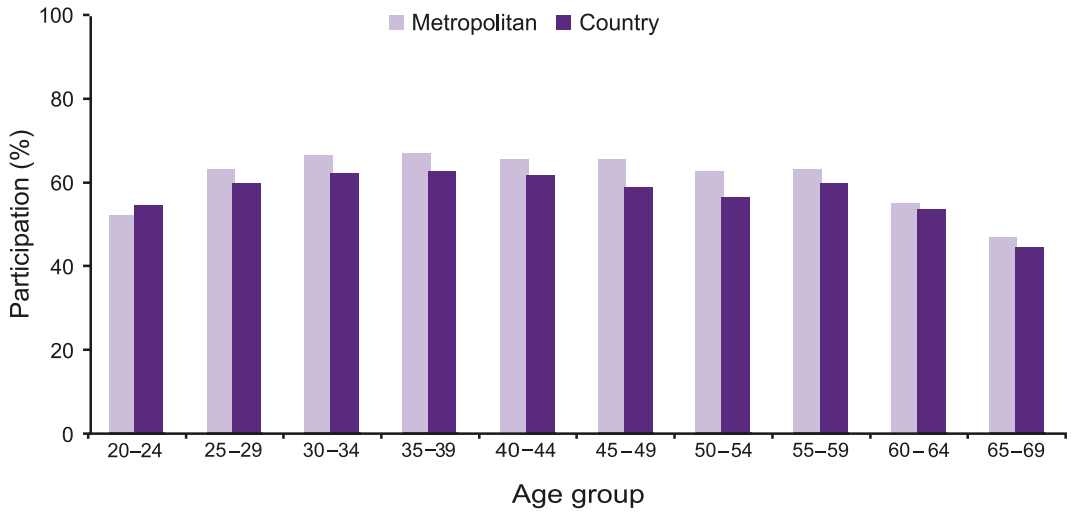
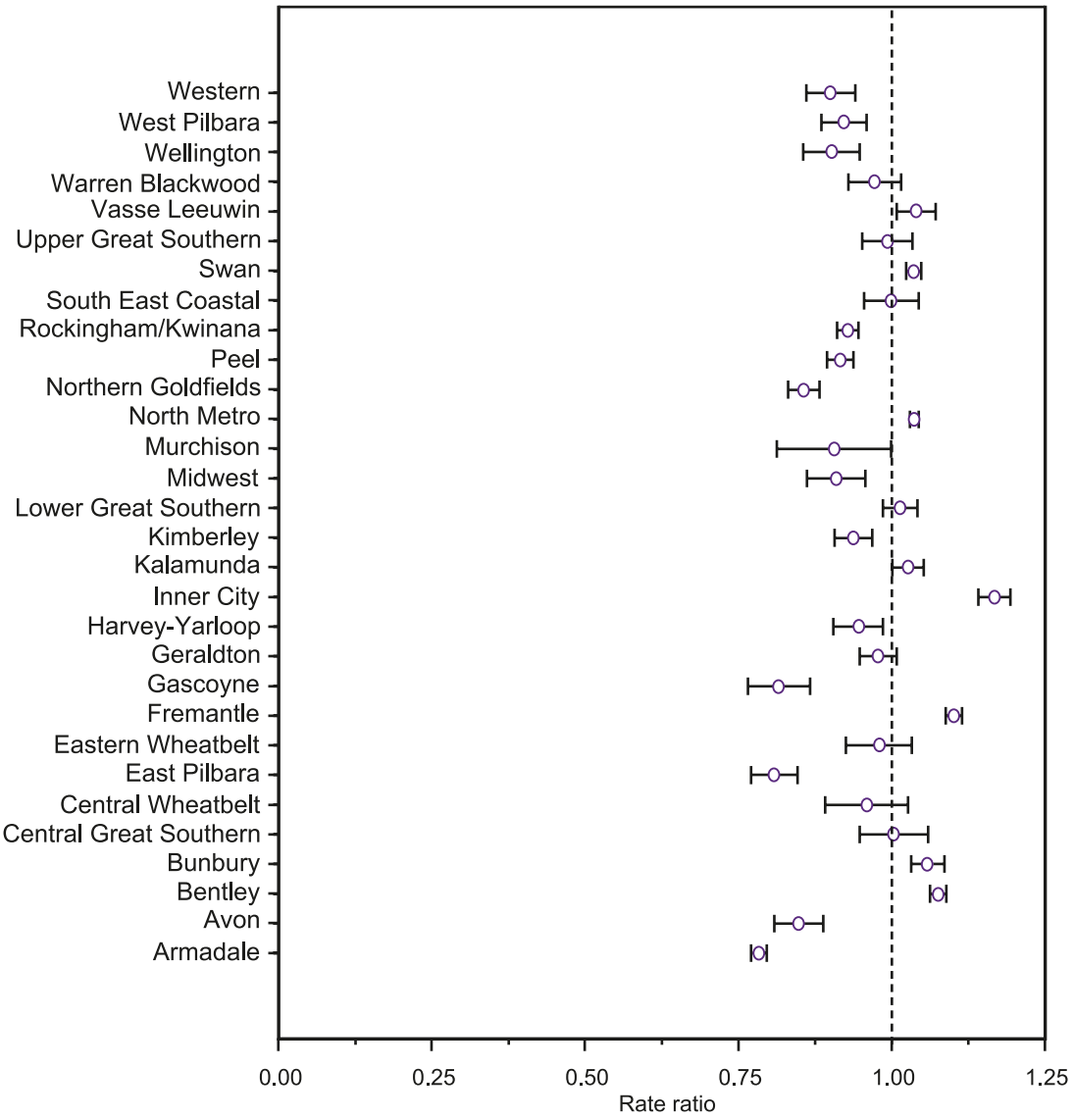


Figure 4.4 Rate ratios of cervical screening participation by Health District compared with WA 2000-01



Note: Bars on graph represent 95% confidence intervals. Those to the right of the dotted line are significantly higher than the State rate while those to the left of the dotted line are significantly lower than the State rate.

From Figures 4.4 and 4.5 it can be seen that Armadale, Avon, East Pilbara, Gascoyne, Harvey-Yarloop, Kimberley, Midwest, Northern Goldfields, Peel, Rockingham/ Kwinana, Wellington, West Pilbara and Western Health Districts all experienced cervical screening participation rates lower than the State rate, and that these differences were statistically significant.

It is also evident that Bentley, Bunbury, Fremantle, Inner City, Kalamunda, North Metropolitan, Swan and Vasse-Leeuwin Health Districts experienced rates that were higher than the State rate, and these rates were also statistically significant.

Figure 4.5 Geographical view of cervical screening participation by Health District compared with WA 2000-01

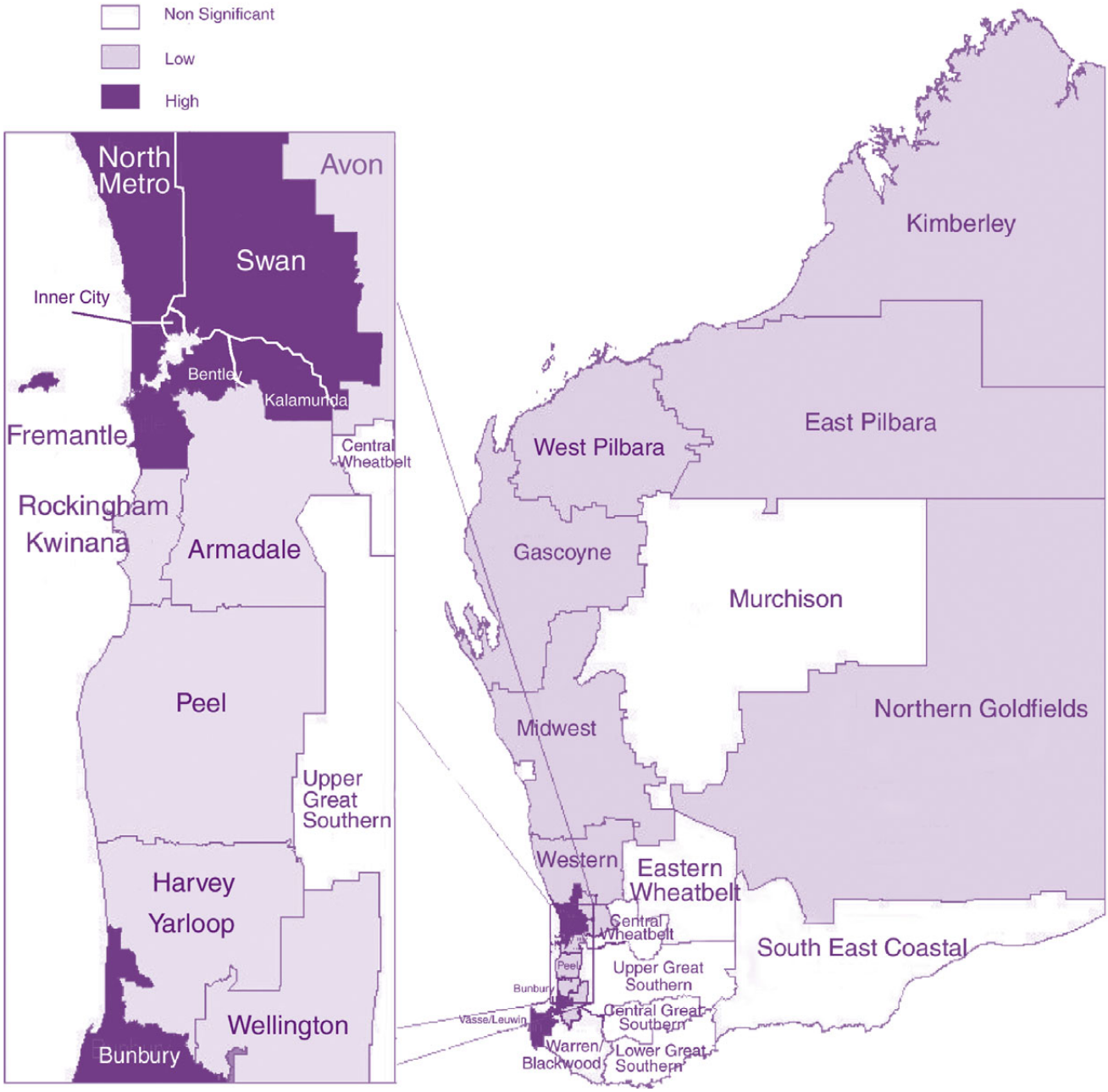


Figure 4.5 also indicates Health Districts with screening rates that were not significantly different to the State rate. These are Central Great Southern, Central Wheatbelt, Eastern Wheatbelt, Geraldton, Lower Great Southern, Murchison, South East Coastal, Upper Great Southern and Warren-Blackwood.

5. Early re-screening

To assess the level of adherence to the National Policy of two-yearly screening, figures were obtained for the proportion of women who were re-screened within a 21-month period, following a normal Pap smear result.

To comply with National standards, February was selected as the index month for all States and Territories, as it is a relatively stable month in terms of the number of women who present for screening. Table 5.1 displays the frequency of women who have had subsequent smears within 21 months (following a normal smear report taken in February 2000).

Table 5.1 Early re-screening: number and percentage of women having a repeat test within 21 months of a normal Pap smear

Number of repeat tests in a 21-month period after a normal Pap smear	Number of women	Percentage of women
0 (i.e. no repeat test)	10,827	74.2
1	3,568	24.5
2	177	1.2
3	11	0.1
4	0	0.0
5 or more	0	0.0
Total	**14,583**	**100**

Note: Includes all women with an address in WA at the time of the Pap smear. Excludes women's records after the date of hysterectomy or from the initial vault smear, i.e. post-hysterectomy.

Almost 26% of women screened had repeat smears within this 21-month period. Only 1.3% of these women exceeded one repeat smear. Approximately 74% of women did not have another smear over this time.

Previous report figures for this section are not directly comparable due to a change in definition of 'early re-screening' by the NCSP from 24 months to 21 months. This redefinition partly contributed to a decrease in numbers from 1998-99 (46%) to 1999-2000 (33%).

> *Early re-screening is the repeating of a Pap smear within 21 months of a negative report, except for women who are being followed-up in accordance with the NHMRC guidelines for the management of cervical abnormalities.*

It is anticipated that women with a history of abnormality may re-screen within 24 months. Recent improvements to the CCR Register have enabled the extraction of data that provides a more useful picture of women who are re-screening outside of NHMRC guidelines. Clinical reasons for subsequent Pap smears within two years are not recorded in the CCR Register.

6. Cytology reports

Pap smear results are coded according to standard CCR report categories (see Appendix A - Cytology Codes). This code consists of a combination of results observed for a range of cell types. Table 6.1 summarises the profile of cytology reports for all laboratories combined and the range among the various laboratories. In 2001, 90.2% of smears were reported as normal, 7.4% indicated the presence of a low-grade abnormality and 1.1% reported as either possible or definite high-grade abnormalities (Table 6.1). These figures are consistent with previous years.

The wide variation between laboratories in the proportion of normal smears is partly accounted for by the fact that some laboratories primarily serve doctors investigating women with abnormalities.

Table 6.1 Cytology report categories 2001

Cytology report category	Number	All laboratories (%)	Range (%)
Unsatisfactory	2,825	1.4	0.4 – 6.9
Normal	184,303	90.2	49.6 – 96.4
Low-grade epithelial abnormality	15,039	7.4	2.4 – 43.9
Inconclusive (possible high-grade lesion)	639	0.3	0.0 – 1.4
High-grade epithelial abnormality (CIN II or higher)	1,581	0.8	0.3 – 6.1
Total	**204,387**	**100**	

6.1 Analysis of individual components

Table 6.2 shows the distribution of results for the squamous cell component of the cytology reports. The percentage of Pap smears reported as having an unsatisfactory squamous cell component was 1.4%, which is in accordance with the Royal College of Pathologists of Australasia performance standards[6]. The percentage of abnormal squamous cell categories (includes all categories from mild cellular changes up to squamous cell carcinoma) reported was 8.3%. In 2000 this figure was 7.4%. The proportion of smears with mild cellular changes had been declining in previous years but showed a marginal increase from 5.7% in 2000 to 6.1% in 2001.

Table 6.2 Squamous cell categories 2001

Squamous cell category	Number	All laboratories (%)	Range (%)
Unsatisfactory	2,825	1.4	0.4 – 6.9
No abnormal squamous cells	184,686	90.4	50.5 – 96.4
Mild cellular changes	12,384	6.1	1.2 – 40.5
Mild dysplasia (CIN I)	2,427	1.2	0.0 – 5.4
Inconclusive (possible high-grade lesion)	539	0.3	0.0 – 1.0
Moderate dysplasia (CIN II)	827	0.4	0.1 – 2.4
Severe dysplasia/ carcinoma-in-situ (CIN III)	636	0.3	0.0 – 3.0
Suspicious of microinvasion or invasion	38	<0.1	0.0 – 0.2
Squamous cell carcinoma	25	<0.1	0.0 – 0.4
Total	**204,387**	**100**	

6 Royal College of Pathologists of Australasia (RCPA) Performance Standards for Gynaecological Cytology.

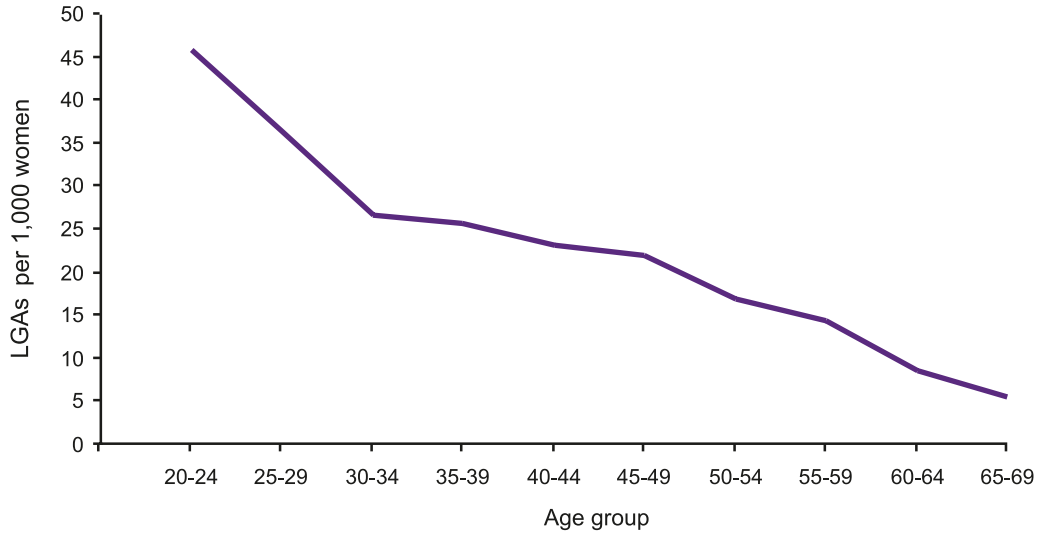
Table 6.3 Endocervical cell categories 2001

Endocervical cell category	Number	All laboratories (%)	Range (%)
Unsatisfactory	2,464	1.2	0.4 – 5.1
No endocervical cells	31,846	15.6	5.6 – 19.2
No abnormal endocervical cells	169,474	82.9	79.8 – 89.1
Atypical endocervical cells	364	0.2	0.0 – 2.0
Possible high-grade (including dysplasia)	190	0.1	0.0 – 0.7
Andenocarcinoma-in-situ	38	<0.1	0.0 – 0.1
Suspicious of adenocarcinoma of the cervix	4	<0.1	0.0 – <0.1
Adenocarcinoma of the cervix	7	<0.1	0.0 – <0.1
Total	**204,387**	**100**	

Table 6.3 shows the distribution of results for the endocervical cell component of cytology reports. Abnormalities of endocervical cells (which include all categories from atypical up to adenocarcinoma of the cervix) were reported in 0.3% of smears and possible or definite high-grade glandular abnormalities in 0.1%.

An endocervical component was absent in 15.6% of smears - this figure was 13.6% for the 2000 period, which represented 29,288 smears. The absence of endocervical cells on a Pap smear may be due to a number of reasons (including sampling).

Figure 6.1 Age-specific low-grade abnormality rates by women aged 20-69 years WA 2001

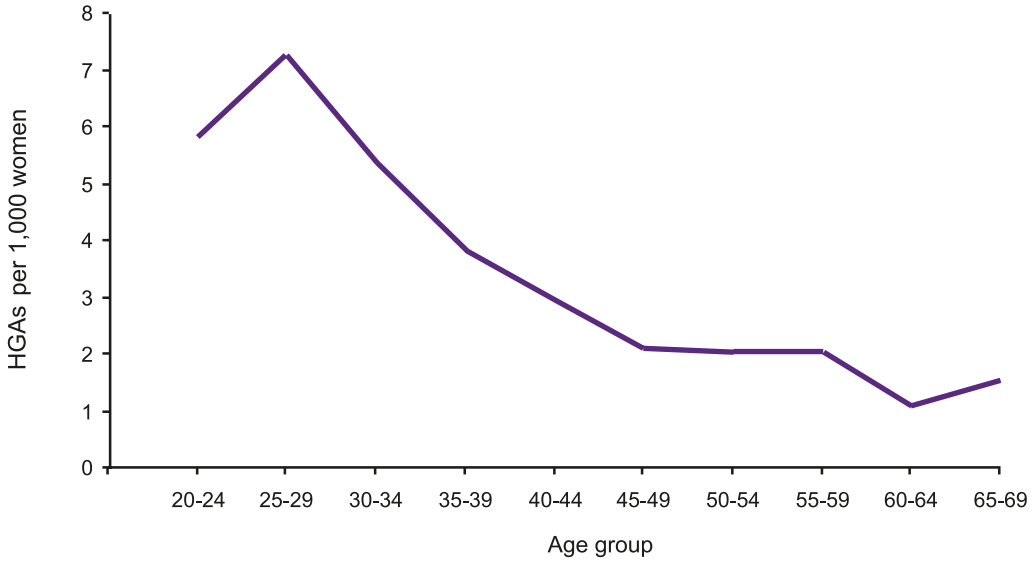


Note: A low-grade abnormality is defined as: Epithelial abnormality (E2, S2 or S3 (CIN I)). Includes HPV effect alone and atypia short of dysplasia. Rates are expressed per 1,000 women.

Source: Cytology Codes, WA Cervical Cancer Prevention Program (Appendix A).

Figures 6.1 and 6.2 suggest that both low and high-grade abnormality rates decline with age. These results indicate that low-grade and high-grade abnormalities on cytology were more prominent for females aged between 20-29 years than any other age group.

Figure 6.2 Age-specific high-grade abnormality rates by women aged 20-69 years WA 2001



Note: A high-grade abnormality is defined as: Intraepithelial abnormality (E4, S5 (CIN II), S6 (CIN III); Invasive/ Malignant (E5, E6, S7, S8); Inconclusive (E3, S4). Rates are expressed per 1,000 women.

Source: Cytology Codes, WA Cervical Cancer Prevention Program (Appendix A).

7. Follow-up and reminder letters to women and practitioners

An important function of the CCR is to provide a 'safety net' to help ensure that women with abnormal results are appropriately followed-up, and that women who have had normal smears are returning for smears close to the recommended time frame. The CCR has a series of protocols for the generation of letters to practitioners and/ or women depending on the most recent Pap smear result. Table 7.1 outlines the CCR's *Protocol of Actions*. The *Protocol of Actions* for follow-up of low-grade abnormalities was reviewed and amended in November 2000 to allow for appropriate clinical management of women, as recommended by the WACCPP Advisory Group. Previously, reminder letters were initiated at 15 months for providers and 21 months for women.

The CCR is updated monthly with information from the WA Death Registry to ensure that reminder letters are not sent to deceased women.

The CCR allows for withholding of follow-up letters in such cases as pregnancy. The service provider advises the expected date of delivery, and a letter is normally sent six months after this date.

Table 7.1 CCR Protocol of Actions

Cytology report	Action
	If no follow-up information is received by the CCR:
Unsatisfactory	– Reminder letter to provider at 6 months; – Reminder letter to woman at 12 months if still no follow-up information received.
Normal	– Reminder letter to woman at 3 years unless hysterectomy is known.
Low-grade abnormality	– Reminder letter to provider at 18 months; – Reminder letter to woman at 24 months if still no follow-up information received.
Inconclusive or high-grade abnormality	– Questionnaire letter to provider at 9 months; – Reminder letter to woman at 12 months if still no follow-up information received. – If **still** no follow-up information received, reminder letter (registered post with delivery confirmation) to the woman at 15 months.

7.1 Reminders to women with normal Pap smears

A reminder letter is sent to women whose last Pap smear result was normal and no further smear has been recorded within a three-year period. In the 2001 calendar year, 52,524 reminder letters were sent to women following a normal smear. This represented a 19% increase from the previous year. Of these women, 17% had a follow-up smear within three months of the reminder letter being sent (see Table 7.2). This level of response was similar to that seen in previous years.

7.2 Follow-up letters for unsatisfactory and abnormal Pap smear results

For follow-up of unsatisfactory and low-grade abnormal Pap smears, a letter is sent to the provider according to the CCR's *Protocol of Actions* (see Table 7.1). If follow-up information is not received within six months, a letter is sent directly to the woman. For high-grade abnormal Pap smears (including inconclusive findings), if no follow-up information is received within three months of sending a letter to the provider, a letter is sent directly to the woman. Various databases are searched for a current address when locating women with high-grade abnormalities. If no follow-up information is received within three months of that letter being sent, another reminder letter is sent registered post (with delivery confirmation) to the woman.

In 2001, a total of 3,844 follow-up letters pertaining to unsatisfactory and abnormal Pap smears were sent to providers and 2,211 letters were sent to women.

Table 7.2 displays the outcome of these reminder and follow-up letters. Apart from the reminders to women with normal smear results, letters are sent directly to the woman only if the CCR has not received follow-up information. It is important to note the table represents women who have not had a repeat smear or appropriate biopsy prior to activation of the *Protocol of Actions*. Also worth noting is that of the 54,735 letters sent to women in 2001, approximately 17% were returned to sender, indicating that the woman had changed address since the time of her most recent smear.

Table 7.2 Outcome of reminder and follow-up letters sent by the CCR in 2001

Letter type	Women who had follow-up within three months of letter		
	Number of letters sent**	Number	Percentage
'Normal' to woman	52,524	9,164	17.4
'Unsatisfactory' to provider	1,427	472	33.1
'Unsatisfactory' to woman	621	141	22.7
'Low-grade abnormality' to provider	2,217	512	23.1
'Low-grade abnormality' to woman	1,502	283	18.8
'High-grade abnormality'* to provider	200	63	31.5
'High-grade abnormality'* to woman	63	24	38.1
2nd 'high-grade abnormality' to woman	25	9	36.0

* High-grade abnormalities include results classified as 'Inconclusive - raising the possibility of a high-grade lesion'.

**This refers only to follow-up letters generated in 2001. The number of letters shown as sent to women is less than the number of women who were overdue for follow-up, as reminder letters continued to be sent into 2002.

Table 7.2 demonstrates one of the 'safety net' functions of the CCR, whereby follow-up letters are sent as a timely reminder to support both providers and women. Ninety-six women with an inconclusive/ high-grade abnormality and no initial follow-up information had either a Pap smear or biopsy within three months of the follow-up letter to their provider or themselves.

The CCR was initially unable to monitor follow-up for only 16 women with inconclusive/ high-grade abnormalities during 2001. The *Protocol of Actions* and various other methods, including requesting information from the Health Insurance Commission, were utilised in obtaining further follow-up information. According to information since received into the CCR Register, 10 of these women have now been re-screened. Further attempts to locate women who are lost to follow-up are carried out periodically.

8. Histopathology (biopsy) reports

The CCR collects information relevant to cervical biopsies. In 2001, a total of 7,923 women had at least one cervical biopsy. Corresponding figures for 1999 and 2000 were 6,923 and 5,490 respectively. Table 8.1 shows biopsies by report category for women of all ages.

Table 8.1 Biopsy report categories 2001

Biopsy report category	Number	Percentage
Unsatisfactory	97	1.0
Normal (no abnormality reported)	3,949	42.7
Low-grade intraepithelial abnormality	2,965	32.1
High-grade intraepithelial abnormality	2,034	22.0
Invasive malignancy	198	2.1
Total	**9,243**	**100**

Note: As some women had more than one biopsy in 2001, the number of biopsies recorded is higher than the number of women.
This table includes results for women who have had a hysterectomy.

A normal result was reported for 42.7% of biopsies, 32.1% showed the presence of a low-grade intraepithelial abnormality and 22.0% of biopsies revealed a high-grade intraepithelial abnormality. Invasive malignancy was shown in 2.1% of biopsies. These figures represent an increase in the proportion of normal biopsies compared with 2000, in which 32.1% were reported as normal, while there was a reduction in the proportion of both low-grade (40.0%) and high-grade (25.2%) abnormalities reported. In 2000, just 1.0% of biopsies were found to show invasive malignancy. Refer Appendix B - Histology Codes.

9. Cytology and histopathology correlation

The CCR provides information for the correlation of cytology and histopathology results to assist with quality control in pathology laboratories. In 2001, 1,581 Pap smears were reported as having a high-grade intraepithelial lesion (CIN II, CIN III, or adenocarcinoma-in-situ). Of these cases, 1,391 (88%) had a follow-up biopsy within six months.

Table 9.1 shows that in approximately 11% of cases the biopsies were negative or benign, while 17% showed a low-grade intraepithelial abnormality. RCPA Performance Standards require that not less than 65% of women with a cytological report of high-grade intraepithelial abnormality are confirmed on histology within six months as having a high-grade abnormality[7]. Almost 66% of histology reports in WA confirmed the cytology finding of a high-grade intraepithelial abnormality. Invasive malignancy was present in 5.6% of cases.

Table 9.1 Biopsy reports following high-grade intraepithelial abnormality on cytology 2001

Biopsy report	State number	State percentage	National (%)	National range (%)
Unsatisfactory	11	0.8	0.5	0 – 3.2
Negative/ benign	151	10.9	7.3	0 – 14.4
Low-grade intraepithelial abnormality	238	17.1	15.9	0 – 41.7
High-grade intraepithelial abnormality	913	65.6	73.9	0 – 100.0
Invasive malignancy	78	5.6	1.9	0 – 100.0
Total	**1,391**	**100**		

Note: Includes national aggregate percentages and range taken from RCPA Cytopathology Quality Assurance Program 2002 for Performance Measure 3; *Reliability of a cytological report of high-grade intraepithelial lesion (Data for January 1 to December 31, 2001).*

7 Suggested acceptable standard set by the Royal College of Pathologists of Australasia Cytopathology Quality Assurance Program 2001 for Performance Measure 3; *Reliability of a cytological report of high-grade intraepithelial lesion.*

9.1 Correlation between cytology and histopathology reports

The following data (Tables 9.2 and 9.3) refer to numbers of women rather than numbers of Pap smears or biopsies. Table 9.2 attempts to gauge the accuracy of cytological predictions of abnormality by correlating histology findings for the same woman within a six-month period. The figures in this table represent all women who had an abnormal Pap smear recorded at the CCR in 2001 with histological follow-up within six months. Proportions should be interpreted carefully, as some predictions represent small numbers. It should also be noted that Pap smears showing atypia and HPV effect are not normally followed-up by biopsy.

A hierarchical ranking was used to select the most severe Pap smear for individual women and the most severe biopsy. Where both squamous and glandular abnormalities were present and at a level of at least severe dysplasia, both components are presented e.g. CIN III and adenocarcinoma-in-situ. Table 9.2 expresses the results of histology within a six-month time frame. It is accepted that these findings may differ given another time frame, e.g. twelve months.

For high-grade squamous or combined squamous and glandular abnormalities on smears, the positive predictive value [(PPV) proportion of those with a predicted abnormality in whom the abnormality was confirmed on biopsy] was as follows:

- Inconclusive 41.8%
- CIN II 63.6%
- CIN III 87.5%
- CIN III + AIS 88.9%
- SCC 94.2%

The CCR does not collect information relating to colposcopy alone. Follow-up data that may have involved this investigation alone without biopsy is therefore not included in the following table. It is also recognised that some women who do not appear to have had histological follow-up for high-grade predictions, may have been followed-up outside of the six-month period.

Table 9.2 Correlation between cytology and histopathology reports for squamous or combined squamous and glandular abnormalities on Pap smears with histology findings within six months

HISTOLOGY FINDINGS	CYTOLOGY PREDICTIONS																	
	ATYPIA		HPV		CIN I		INCONCLUSIVE Poss HSIL[1], Poss AIS[2]		CIN II		CIN III		CIN III + AIS[3]		SCC[4]		SCC[4] + AdenoCa Cx[5]	
	Total = 9499 n = 1212[7]		Total = 1248 n = 220[7]		Total = 2158 n = 1310[7]		Total = 469 n = 350[7]		Total = 761 n = 650[7]		Total = 560 n = 506[7]		Total = 9 n = 9[7]		Total = 58 n = 52[7]		Total = 1 n = 1[7]	
UNSATISFACTORY	18	1.5%	3	1.4%	9	0.7%	4	1.1%	5	0.8%	1	0.2%						
NORMAL	453	37.4%	50	22.7%	237	18.1%	96	27.4%	71	10.9%	29	5.7%	1	11.1%	2	3.8%		
ATYPIA	229	18.9%	26	11.8%	152	11.6%	46	13.1%	43	6.6%	11	2.2%			1	1.9%		
HPV	196	16.2%	82	37.3%	194	14.8%	20	5.7%	25	3.8%	8	1.6%						
CIN I	171	14.1%	46	20.9%	409	31.2%	38	10.9%	92	14.2%	14	2.8%						
CIN II	95	7.8%	9	4.1%	221	16.9%	75	21.4%	227	34.9%	86	17.0%	1	11.1%				
CIN III	44	3.6%	3	1.4%	86	6.6%	59	16.9%	179	27.5%	324	64.0%			18	34.6%		
CIN III + AIS[3]							2	0.6%	3	0.5%	5	1.0%	5	55.6%				
AIS[3]	1	0.1%			1	0.1%	1	0.3%	4	0.6%	2	0.4%	2	22.2%				
SCC[4]					1	0.1%	3	0.9%	1	0.2%	23	4.5%			27	51.9%	1	100%
AdenoCa Cx[5]	3	0.2%					1	0.3%			1	0.2%						
SCC[4] + AdenoCa Cx[5]											1	0.2%			3	5.8%		
Other Carcinomas[6]	2	0.2%	1	0.4%			5	1.4%			1	0.2%			1	1.9%		
Total		100%		100%		100%		100%		100%		100%		100%		100%		100%
No biopsy follow-up recorded at CCR within six months of index smear	8287		1028		848		119		111		54		0		6		0	

[1] Possible high-grade intraepithelial lesion

[2] Possible adenocarcinoma-in-situ

[3] Adenocarcinoma-in-situ

[4] Squamous cell carcinoma

[5] Adenocarcinoma of cervix

[6] Endometrial, vaginal or ovarian cancer

[7] Number of cases with biopsy follow-up

Table 9.3 Correlation between cytology and histopathology reports for glandular abnormalities on Pap smears with histology findings within six months

HISTOLOGY FINDINGS	CYTOLOGY PREDICTIONS							
	ATYPIA Total = 231 n = 15[6]		INCONCLUSIVE Possible AIS[1] Total = 59 n = 44[6]		AIS[2] Total = 23 n = 20[6]		AdenoCa Cx[4] Total = 10 n = 8[6]	
UNSATISFACTORY	1	6.7%						
NORMAL	10	66.7%	15	34.1%	2	10.0%		
ATYPIA	1	6.7%	4	9.1%	4	20.0%		
HPV			3	6.8%				
CIN I	2	13.3%	4	9.1%				
CIN II					1	5.0%		
CIN III			2	4.5%			2	25.0%
CIN III + AIS[2]			1	2.3%	2	10.0%		
AIS[2]	1	6.7%	10	22.7%	7	35.0%		
SCC[3]								
AdenoCa Cx[4]			3	6.8%	3	15.0%	4	50.0%
SCC[3] + AdenoCa Cx[4]								
Other Carcinomas[5]			2	4.5%	1	5.0%	2	25.0%
Total		100%		100%		100%		100%
No biopsy follow-up recorded at CCR within six months of index smear	216		15		3		2	

[1] Possible adenocarcinoma-in-situ
[2] Adenocarcinoma-in-situ
[3] Squamous cell carcinoma
[4] Adenocarcinoma of cervix
[5] Endometrial, vaginal or ovarian cancer
[6] Number of cases with biopsy follow-up

Pap smears reporting glandular abnormalities are analysed in Table 9.3. As with Table 9.2, caution should be used when evaluating figures where small numbers are specified. Histological follow-up is not normally done for glandular atypia.

The positive predictive values (PPV) for diagnosis of high-grade glandular abnormalities were as follows:

- Inconclusive 40.8%
- AIS 70.0%
- AdenoCa Cx 100.0%

Glossary

Age-standardised rates: Calculated by the direct method and represent a summation of weighted age-specific rates (weighting being determined by the relative proportion of the population in each age group compared with the proportion in the Australian Standard Population).

Age-specific rates: Based on five-year age intervals and are calculated by dividing the number of cases by the population of the same sex and age group.

Atypia or minor atypia: Very slight changes in cells for which the cause is not obvious. Often these changes are due to inflammation and sometimes due to HPV effect.

CIN (Cervical intraepithelial neoplasia): Present when normal surface epithelium (tissue) is replaced by neoplastic (abnormal) cells.

CIN I (Mild dysplasia): Present when the lowest layer of tissue is replaced by abnormal cells.

CIN II (Moderate dysplasia): Present when the lowest and middle layers of tissue are replaced by abnormal cells.

CIN III (Severe dysplasia/carcinoma-in-situ): Present when the whole thickness of tissue is affected.

Country: Rural and remote regions of WA.

High-grade abnormality - Pap smear: CIN II; CIN III; suspicious of microinvasion or invasion; squamous carcinoma; adenocarcinoma-in-situ; suspicious of adenocarcinoma of the cervix; or adenocarcinoma.

HPV effect: Cellular changes due to Human Papilloma Virus.

Incidence rate: The number of new cases of disease during a given time period in a specified population, divided by the population at risk.

Inconclusive - Pap smear: Cytological findings raising the possibility of a high-grade lesion; accurate diagnosis is not possible.

Low-grade abnormality - Pap smear: Mild cellular changes including minor squamous atypia, HPV effect alone; CIN I; or atypical endocervical cells.

Mortality rate: The number of deaths during a given time period in a specified population, divided by the population at risk. The mortality rate in this report is a 'cause-specific mortality rate', showing deaths from cancer of the cervix.

Positive Predictive Value (PPV): Percentage of cytological predictions of a given cytological category in each category that are confirmed to be a high-grade lesion on histology. The denominator is the number of cases with biopsy follow-up.

Unsatisfactory - Pap smear: The cervical cells cannot be assessed sufficiently to give an accurate report.

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Appendix A - Cytology Codes

C Report Category[1]	S Squamous Cell	W Wart Virus Changes	E Endocervical	M Endometrial	O Other
CØ Unsatisfactory.	SØ Unsatisfactory for evaluation e.g. poor cellularity, poor preservation, cell detail obscured by inflammation/ blood staining, degenerate cells.	WU Due to the unsatisfactory nature of the smear, no assessment has been made[2].	EU Due to the unsatisfactory nature of the smear, no assessment has been made[2].	MU Due to the unsatisfactory nature of the smear, no assessment has been made.	OU Due to the unsatisfactory nature of the smear, no assessment has been made.
C1 Normal.	S1 Cell numbers and preservation satisfactory. No abnormality or only reactive changes.	W1 Absent.	E- Not applicable; vault smear; previous hysterectomy. EØ No endocervical cells. E1 Endocervical cells present. No abnormality or only reactive changes.	M1 No endometrial cells. M2 Endometrial cells present (cytologically benign).	O1 No other abnormal cells.
C2 Low-grade epithelial abnormality[3].	S2 Mild cellular changes including minor squamous atypia, HPV effect alone. S3 Mild dysplasia (CIN 1)	W2 Possibly present. W3 Present (Koilocytosis). See stringent criteria as outlined by NHMRC guidelines.	E2 Atypical endocervical cells.		
C3 Inconclusive[4].	S4 Cytological findings raising the possibility of a high-grade lesion: accurate diagnosis is not possible.		E3 Cytological findings raising the possibility of a high-grade lesion (including glandular dysplasia); accurate diagnosis not possible.	M4 Atypical endometrial cells of uncertain significance.	O2 Abnormal cells present: other.
C4 High-grade epithelial abnormality.	S5 Moderate dysplasia (CIN II). S6 Severe dysplasia (CIN III). S7 Suspicious of microinvasion or invasion. S8 Squamous carcinoma.		E4 Adenocarcinoma-in-situ. E5 Suspicious of adenocarcinoma of cervix. E6 Adenocarcinoma.	M6 Abnormal endometrial cells suggesting atypical hyperplasia or malignancy. M7 Adenocarcinoma.	O3 Malignant cells present: ovary. O4 Malignant cells present: vagina. O5 Malignant cells present: metastatic malignancy. O6 Malignant cells present: uncertain or unknown origin.

1 The Report Category (C code) is provided by laboratories. The CCR system also assigns a report category or state code based on an algorithm of S, W, E, M and Other cell codes. The state code determines the protocol of actions.

2 If the smear is unsatisfactory (i.e. CØ, SØ) but an assessment of warts and endocervical cells is possible, then they should be coded accordingly.

3 "Low-grade epithelial abnormality" includes CIN I, HPV effect alone, and atypia short of dysplasia.

4 "Inconclusive" refers to: (a) cytological findings which raise the possibility of a high-grade lesion, in squamous and endocervical cells, but where accurate diagnosis is not possible.
(b) atypical endometrial cells of uncertain significance.

Cytology Recommendation Codes

R	Recommendation Code
RØ	No recommendation.
R1	Repeat smear 2 years.
R2	Repeat smear 12 months.
R3	Repeat smear 6 months.
R4	Repeat smear 3 months.
R5	Repeat smear 4 weeks.
R6	Colposcopy/ biopsy recommended.
R7	Endometrial curettage recommended.
R8	Already under gynaecological management.
R9	Refer to specialist.

Cytology Infection Codes

I	Infection Code
IU	Due to the unsatisfactory nature of the smear, no assessment has been made.
I1	Normal flora/ doderleins.
I2	Coccoid flora.
I3	Mixed bacteria.
I4	Gardnerella/ clue cells.
I5	Monilia/ candida.
I6	Trichomonads.
I7	Herpes virus.
I8	Lepothrix.
I9	Actinomyces.
IA	Other e.g. chlamydia, adenovirus, cytomegalovirus, Donovan bodies.

Appendix B - Histology Codes

C Report Category[1]	S Squamous Cell	W Wart Virus Changes (HPV Effect)	E Endocervical	M Endometrial	O Other
CØ Unsatisfactory[1].	SØ Unsatisfactory for evaluation[1].	WU Due to the unsatisfactory nature of the biopsy, no assessment has been made[1].	EU Due to the unsatisfactory nature of the biopsy, no assessment has been made[1].	MU Because the endometrial specimen appears to be unsatisfactory, no CCR code has been assigned. See notes.	OU Because the vaginal specimen appears to be unsatisfactory, no CCR code has been assigned. See notes.
C1 Normal (no abnormality reported).	S- Not applicable (no squamous epithelium collected)[2].	W- Not applicable (no squamous epithelium collected)[2].	E- Not applicable[2].	M- Not applicable.	O- Not applicable.
	S1 Native squamous epithelium; squamous metaplasia; immature squamous metaplasia with or without inflammatory or reactive changes; atrophy.	W1 Absent.	E1 Normal; inflammatory or reactive changes; endocervical polyp.	M1 Normal; inflammatory; reactive; hormonal changes.	O1 Normal vaginal tissues; inflammatory; reactive; hormonal changes.
			E2 Mild nuclear changes (probably reactive).	M2 Endometrial hyperplasia.	
C2 Low-grade intraepithelial abnormality.	S2 Atypia; atypical immature squamous metaplasia.	W2 Suggestive/ possible.		M3 Endometrial atypical hyperplasia (mild).	O2 HPV effect in vaginal tissues.
	S3 HPV effect.	W3 Definite/ consistent.			O3 Vaginal intraepithelial dysplasia (VAIN I).
	S4 Mild dysplasia (CIN I).				
C3 High-grade intraepithelial abnormality.	S5 Moderate dysplasia (CIN II).		E3 Endocervical dysplasia.	M4 Endometrial atypical hyperplasia (moderate to severe).	O4 Vaginal intraepithelial neoplasia (VAIN II - VAIN III).
	S6 Severe dysplasia/ CIS (CIN III).		E4 Adenocarcinoma-in-situ.		
C4 Invasive malignancy.	S7 Microinvasive squamous cell carcinoma.		E5 Microinvasive adenocarcinoma.	M5 Endometrial carcinoma (all types).	O5 Vaginal squamous cell carcinoma.
	S8 Invasive squamous cell carcinoma.		E6 Invasive adenocarcinoma.	M6 Endometrial stromal tumour.	O6 Vaginal adenocarcinoma.
			E7 Adenosquamous carcinoma (cervix).	M7 Mixed mullerian tumour.	O7 Ovarian carcinoma (all types).
			E8 Carcinoma of cervix (other).		O8 Metastatic tumour
					O9 Other malignancy.

[1] Unsatisfactory cervical biopsies should be coded: CØ, SØ, WU, EU, M-, O-. If the biopsy is unsatisfactory (i.e. CØ, SØ) but an assessment of warts and endocervical cells is possible, then they can be coded accordingly.

[2] Use of S-, W-, E- codes applies to specimens other than cervical biopsies (e.g. endometrial curettage).

Endometrial codes: MU should only be used if the type of specimen was T5 (endometrial curettage), T6 (hysterectomy) or TS (subtotal hysterectomy) and it was not possible to assign a CCR endometrial code, because the specimen appeared to be unsatisfactory or the findings of the endometrial histology were not evident from the report.

Other codes: OU should only be used if the type of specimen was T7 (vaginal biopsy) and it was not possible to assign a CCR "other" code because the specimen appeared to be unsatisfactory.

Histology Specimen Types

T	Specimen Type
TA	Amputated cervix.
TP	Cervical polyp.
TS	Subtotal hysterectomy.
TØ	Not disclosed.
T1	Punch biopsy of cervix.
T2	Endocervical curettage.
T3	Large loop excision of TZ.
T4	Cone biopsy.
T5	Endometrial curettage.
T6	Hysterectomy.
T7	Vaginal biopsy.
T8	Other pelvic tissues.
T9	Metastatic sites.

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