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Department of **Health**

Cervical Cytology Registry (CCR) of Western Australia

2006 Statistical Report

WA Cervical Cancer Prevention Program

Delivering a **Healthy WA**

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THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL GUIDELINES FOR THE MANAGEMENT OF SCREEN DETECTED ABNORMALITIES: IMPLICATIONS FOR THIS REPORT

On 1st July 2006, the National Health and Medical Research Council (NHMRC) Guidelines for the Management of Asymptomatic Women with Screen Detected Abnormalities were adopted. *The main changes to the existing guidelines were:*

1. Change of terminology for cytology reports to reflect the Australian Modified Bethesda System of reporting. This report uses the new terminology.
2. Establishment of a national coding system for cytology results. During the change over to the new coding schedule, the previous codes were mapped across to the updated coding system. Data provided in this report uses the new coding schedule.
3. Repeat Pap smears instead of referral for colposcopy for most women with low-grade squamous abnormalities.
4. Referral of all women with atypical glandular cells for colposcopy.
5. Referral of all women with possible high-grade lesions for colposcopy.
6. Use of HPV tests and cytology as a test of cure for women treated for CIN (II/III).

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Acknowledgements

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Special thanks must also be reserved for the women of WA.

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Summary

This report is the eleventh annual statistical report of the Cervical Cytology Registry (CCR) of WA. The main features of the following statistical report are summarised below. Any 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. The report also reflects the terminology and coding changes in the revised NHMRC guidelines for the management of screen detected abnormalities, adopted from July 1st, 2006.

The target population for the WA Cervical Cancer Prevention Program (WACCPP) is women aged 20 to 69 years. All data in this report is based on this age range, unless specified otherwise. For the purposes of comparison in this report, the retrospective time period utilised is 1996-2006.

Incidence and mortality

- The number of new cases of cervical cancer in WA among women aged 20-69 years has decreased from 63 new cases in 2005 to 52 detected in 2006. The trend for 1996-2006 has been fluctuating, with the lowest point of 48 new cases in 1997 and the highest point of 80 cases in 1998. Since 2001 the general trend has shown a decreasing number of new cases detected.
- The number of deaths in WA women aged 20-69 years due to cervical cancer has also fluctuated for the years 1996 to 2006, from the highest point of 23 deaths in 1996 to the lowest point of 11 deaths in 2004. There were 15 deaths in 2006.
- Since 1996, age-standardised incidence and mortality rates have fluctuated in both metropolitan and country target populations of WA.
- For the years 1996-2006 the WA incidence rates of cervical cancer were 1.9 times higher and mortality rates 4.4 times higher for Indigenous women compared with non-Indigenous women aged 20-69 years.

Participation

- In 2006, 199,149 women in the target population of WA participated in cervical screening. This represented a decrease of 4,659 from 2005 (203,808). The trend for numbers of women screening in previous years has been fluctuating, from the highest point of 209,786 in 1998 to the lowest point of 192,739 in 1996.
- The percentage of women who had been screened in a two-year period increased from 60.4% in 2004-05 to 60.6% in 2005-06.
- In the 2005-06 period, women living in metropolitan areas of WA had a cervical screening participation rate 2.9% above that of their country counterparts. Women aged 20-24 years were the exception to this trend where women living in country areas of WA had a cervical screening participation rate 3.8% above women living in metropolitan areas of WA.
- There has been a general declining trend in cervical screening participation rates for women aged under 45, for the years 1996-2006.

Early re-screening

- *The National Policy on Screening to Prevent Cancer of the Cervix (1991)* states that the recommended cervical screening interval is **two** years following a normal Pap smear result. Of a cohort of women screened in February 2005 who had a normal Pap smear result, 17.6% had a subsequent smear within 21 months. The previous year's figure was 19.3%.

Abnormalities

- In 2006, 89.8% of smears were reported as normal, 6.6% indicated the presence of either possible or definite low-grade abnormality and 1.4% were reported as either possible or definite high-grade abnormalities. These figures are consistent with previous years.
- Both low and high-grade abnormality rates declined with age and high-grade abnormality rates were highest for women aged between 20-29 years than any other age group in 2006. This is consistent with figures from 2005.

Follow-up

- In 2006, 72,190 reminder letters were sent to women following a normal smear. Of these women 22.4% had a follow-up smear within three months of the reminder letter being sent.
- In 2006, 5,417 follow-up letters pertaining to unsatisfactory and abnormal Pap smears were sent to providers and 2,588 letters were sent to women.

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 (NCSP).

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 other cervical cancer screening test results, including cervical biopsy and HPV DNA test results, from women screened in WA. The CCR has been operational since late 1994.

Participation in the Register is voluntary and the confidentiality of data held is governed by legislation *Health (Cervical Cytology Register) Regulations 1991 (WA)*. Service providers are encouraged to inform women about the CCR and if the woman does not object, the pathology laboratory routinely forwards her cervical test results (together with basic identifying information) to the CCR. Provision is made for women to remove their name from the Register at any time by contacting the CCR. Thirty women were withdrawn from the Register at their request in 2006.

As of 31 December 2006, there were approximately three million records (accounting for smears, biopsies and HPV DNA test results) in the Register. The quality of information received by the CCR is dependent on all laboratories providing accurate data by electronic transmission.

The CCR has produced Statistical Reports since 1996. The data presented in this report refers to the 2006 calendar year unless otherwise specified. Ten two-year time periods are utilised for trend data (1996-97, 1997-98, 1998-99,1999-2000, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05, 2005-06).

2. Functions of the CCR

- To act as a 'safety net', providing reminder and follow-up letters to women and medical practitioners when Pap smears and other cervical investigations are overdue.
- To provide a linked record of women's previous cervical screening test results in order to assist pathologists and cytologists in the reporting of current test 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 NCSP.
- To assist with planning and evaluation of Health Promotion and Recruitment strategies for the WACCPP.

3. Cervical cancer in WA

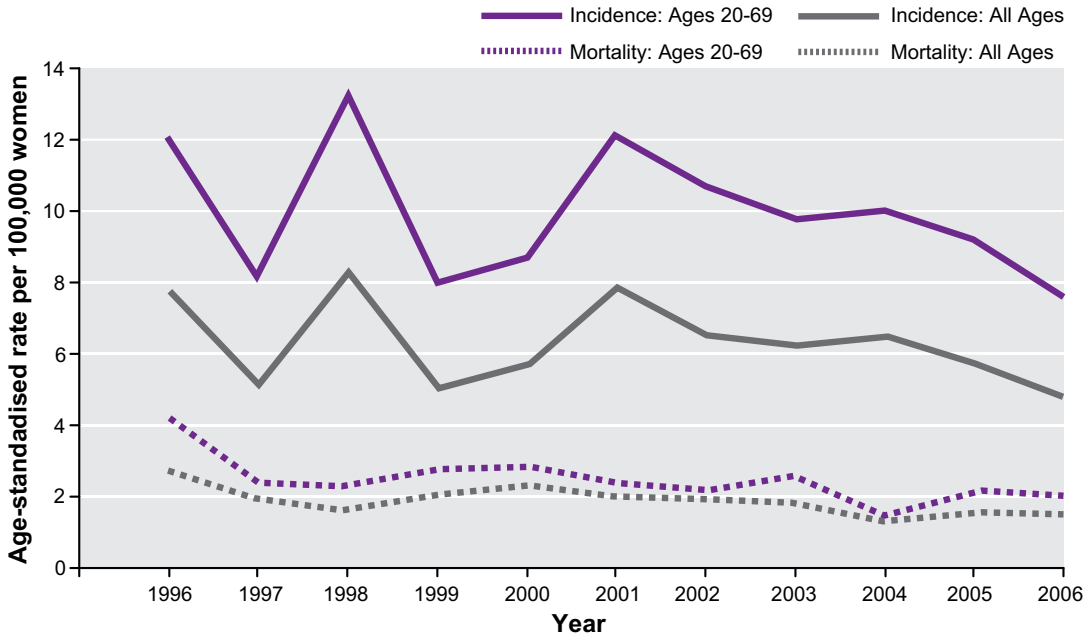
The aim of the WACCPP is to improve the health and well-being of Western Australian women by reducing incidence and mortality from cervical cancer through the implementation of population based cervical screening strategies.

Note: The number of cases of cervical cancer and the number of deaths from cervical cancer in WA are relatively small, especially in rural areas, and so even small changes in the numbers can lead to marked fluctuations in the rates.

As seen in Figure 3.1 there has been a general decline in the age-standardised incidence rate of cervical cancer over the past eleven years (1996-2006) with the lowest point of 4.8 per 100,000 women for all age groups achieved in 2006. The peak seen in 1998 coincided with a national media campaign, 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 women 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 age-standardised cervical cancer mortality rate has fluctuated, but the general trend has been downwards, with a highest point of 4.2 per 100,000 (23 deaths) for women in the target age group 20-69 years and 2.7 per 100,000 (30 deaths) for women of all ages in 1996, to the lowest point of 1.5 per 100,000 (11 deaths) for women in the target age group 20-69 years and 1.3 per 100,000 (22 deaths) for women of all ages in 2004.

Figure 3.1 Age-standardised cervical cancer incidence and mortality rates WA 1996-2006

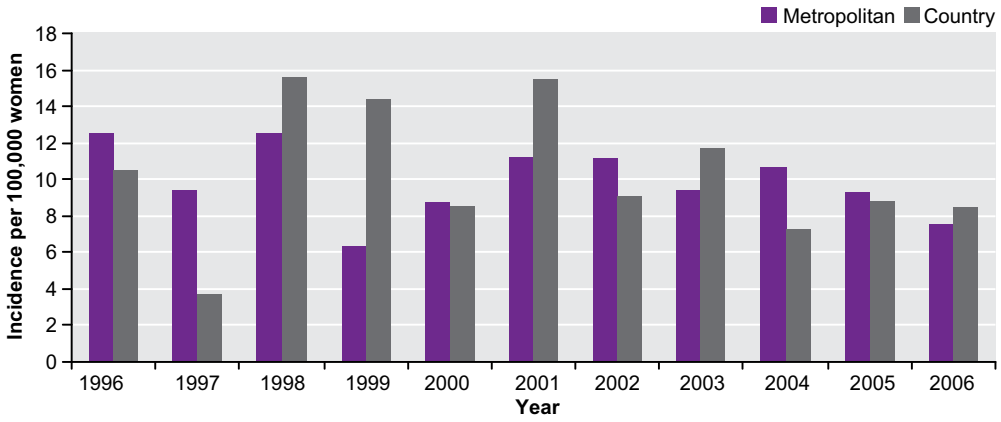


Note: Rates are expressed per 100,000 women and age-standardised to the World population (Segi 1960).

Source: WA Cancer Registry, Department of Health WA (unpublished data current as of January 2008).

Figure 3.2 indicates women from country areas experienced higher age-standardised incidence rates of cervical cancer than their metropolitan counterparts for the years 1998, 1999, 2001, 2003 and 2006. It should be noted again that the actual number of cases is small, and small changes in these numbers can lead to large fluctuations in age-standardised rates.

Figure 3.2 Age-standardised incidence rates of cervical cancer in women aged 20-69 years (metropolitan and country areas of WA) 1996-2006

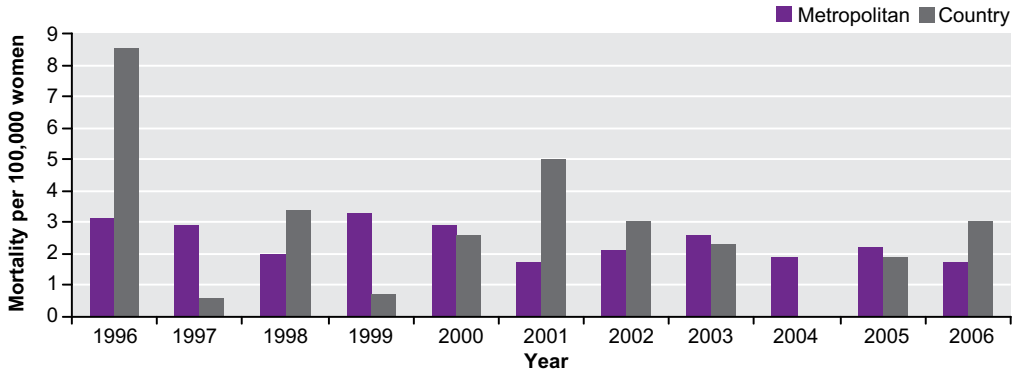


Note: Rates are expressed per 100,000 women and age-standardised to the World population (Segi 1960).

Source: WA Cancer Registry, Department of Health WA (unpublished data current as of January 2008).

Age-standardised mortality rates from cervical cancer for both metropolitan and country target populations have generally fluctuated over the past eleven years (Figure 3.3). These fluctuations were particularly apparent in country areas.

Figure 3.3 Age-standardised mortality rates from cervical cancer in women aged 20-69 years (metropolitan and country areas of WA) 1996-2006

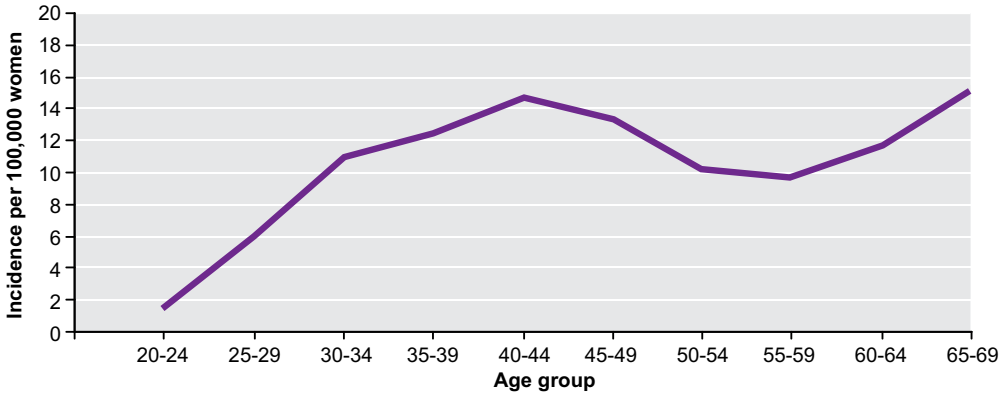


Note: Rates are expressed per 100,000 women and age-standardised to the World population (Segi 1960).

Source: WA Cancer Registry, Department of Health WA (unpublished data current as of January 2008).

Figures for the years 1996-2006 were pooled for examination of incidence (Figure 3.4) and mortality (Figure 3.5) rates by age. From Figure 3.4 it is evident that the age-specific incidence rate of cervical cancer was higher among women aged 40-44 years and those aged 65-69 years for the years 1996-2006.

Figure 3.4 Age-specific incidence rates of cervical cancer in women aged 20-69 years WA 1996-2006

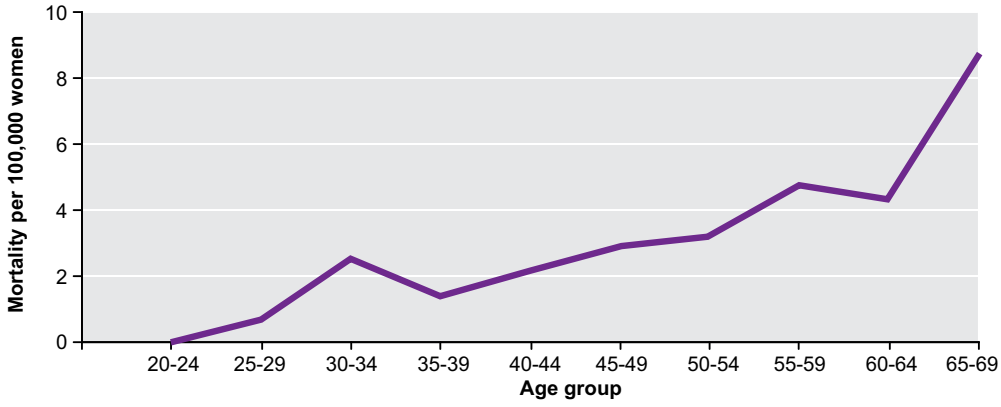


Note: Rates are expressed per 100,000 women.

Source: WA Cancer Registry, Department of Health WA (unpublished data current as of January 2008).

Figure 3.5 shows that amongst the target population of women (aged 20-69 years) the highest age-specific mortality rate was in women aged 65-69 years (8.7 per 100,000 women). This age group accounted for 31 deaths out of the total 171 deaths in the target population for WA for the years 1996-2006.

Figure 3.5 Age-specific mortality rates from cervical cancer in women aged 20-69 years WA 1996-2006



Note: Rates are expressed per 100,000 women.

Source: WA Cancer Registry, Department of Health WA (unpublished data current as of January 2008).

In WA, cervical cancer incidence rates were 1.9 times higher and mortality rates 4.4 times higher for Indigenous women aged 20-69 years compared with non-Indigenous women, for the years 1996-2006[1]. The WACCPP has a dedicated Indigenous Program Officer who implements culturally safe and effective strategies to improve cervical screening uptake amongst Indigenous women of WA.

[1] *WA Cancer Registry, Department of Health WA (unpublished data current as of January 2008).*

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.

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 Medical Research Council (NHMRC) guidelines[2], which were updated and adopted for use from July 1st, 2006, following extensive review of the previous guidelines (1994).

[2] *Screening to Prevent Cervical Cancer Guidelines for the Management of Women with Screen Detected Abnormalities (NHMRC) 2005.*

4.1 Number of tests and women screened per year

A total of 209,381 cytology tests (Pap smears) were performed in 2006 with 199,149 women screened during the year (Table 4.1).

Table 4.1 Number of tests performed and the number of individual women screened 1996-2006

Year	Number of tests performed	Number of women screened
1996	208,127	192,739
1997	209,314	194,979
1998	222,978	209,786
1999	208,211	196,311
2000	208,451	197,433
2001	204,459	193,871
2002	207,205	195,504
2003	209,784	197,649
2004	203,955	193,024
2005	214,390	203,808
2006	209,381	199,149

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.

Several factors influence the number of tests performed and recorded in the Register. Women who choose not to have their results available to the CCR (opt off) are omitted from these figures and it should be noted that in 2006, the proportion of women opting off is <0.1%. This data is 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 according to the CCR 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 proportion of the target population screened is measured by the number of women having a Pap smear in a two-year period.

The denominators for the following percentages are based on the Australian Bureau of Statistics (ABS) *Estimated Resident Population (ERP) - Female - by Postal Areas in WA by five-year age groups*, adjusted for hysterectomy using ABS *2001 National Health Survey* for 1996-2006 ERP. The proportion of women screened in the two-year periods between 1996-97 and 2005-06 was calculated using an average of yearly ERP data.

WA screening participation rates are comparable with national rates. In the 2005-06 period the participation rate in WA was equal (60.6%) to the national cervical screening rate[3]. Attention to identified barriers and strengthening of regional collaborative working relationships is required to ensure continual improvement of the uptake of cervical screening in WA.

Table 4.2 Estimated percentage of women with an intact uterus who had at least one Pap smear for the two-year periods between 1996-1997 and 2005-2006: comparison of WA with Australia as a whole

Year	Percentage of women screened	
	WA	Australia
1996-1997	63.0	61.0
1997-1998	64.2	62.6
1998-1999	63.9	63.4
1999-2000	61.6	61.3
2000-2001	61.4	61.0
2001-2002	60.8	61.0
2002-2003	60.5	60.7
2003-2004	59.7	60.7
2004-2005	60.4	61.0
2005-2006	60.6	60.6

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 1996-97, 1997-98, 1998-99, 1999-2000, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05, 2005-06.

In keeping with the results seen in the number of women screened (Table 4.1), 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). Between the 1997-98 period and 2005-06 period cervical screening participation rates in WA have experienced a decline of 3.6%.

[3] *Caution should be used when interpreting WA participation rates against national rates. WA participation rates are based on all women with an address in WA at the time of the smear. However, the majority of states and territories (except Victoria and Australian Capital Territory) provide participation rates to the AIHW based on all women who were screened in the particular state or territory. Hence, it is acknowledged that this may lead to an over-estimation of numbers of women screened because of double counting of some women between states.*

The overall participation rates for cervical screening have marginally increased from the two-year period 2004-05 to the two-year period 2005-06 (Table 4.3). Participation rates for 2005-06 generally fluctuated in older women, with women aged 60-69 years having the lowest rate (52.1%) compared to the other age groups. Women aged 40-49 years had the highest rate (64.8%). The participation rates among women under the age of 45 years has generally declined from 1996-97 to 2005-06, while the rates among women over 54 years have increased over the same time period.

Some 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 a women's individual screening over time and may lead to an apparent decrease in recorded participation rates.

Table 4.3 Estimated percentage of women by age group with an intact uterus who had at least one Pap smear for the two-year periods between 1996-97 and 2005-06

Percentage of women screened by age											% change 1996 -97 to 2005-2006
Age group	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	
20-24	55.9	55.5	54.1	50.1	50.8	51.8	50.5	49.7	50.7	51.0	-4.9
25-29	67.0	67.8	66.6	62.1	61.8	61.4	59.9	58.6	58.1	58.1	-8.9
30-34	69.0	70.4	70.1	66.9	66.1	64.5	64.0	63.0	63.0	62.9	-6.1
35-39	68.2	69.8	69.2	66.6	66.2	64.6	64.5	63.4	64.4	64.4	-3.8
40-44	65.7	66.5	66.6	65.2	64.9	64.1	64.4	63.2	63.9	64.3	-1.4
45-49	64.3	65.6	65.6	64.4	64.4	63.9	64.8	64.3	65.3	65.4	1.1
50-54	62.6	62.4	62.8	62.8	62.1	61.4	61.5	61.0	62.2	62.6	0.0
55-59	59.4	63.0	63.3	62.6	62.8	62.7	63.0	62.8	64.5	65.2	5.8
60-64	51.5	54.7	55.9	55.5	55.4	54.1	54.0	53.6	54.0	54.4	2.9
65-69	40.5	44.8	46.5	45.9	46.6	46.6	47.5	47.4	48.4	49.1	8.6
20-69	**63.0**	**64.2**	**63.9**	**61.6**	**61.4**	**60.8**	**60.5**	**59.7**	**60.4**	**60.6**	**-2.4**

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

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 4.4 Estimated percentage of women by age group with an intact uterus who had at least one Pap smear for the two-year period 2005-06 and the three-year period 2004-06

Age group	Percentage of women screened	
	2005-2006	2004-2006
20-24	51.0	64.3
25-29	58.1	72.4
30-34	62.9	77.5
35-39	64.4	77.2
40-44	64.3	76.2
45-49	65.4	76.4
50-54	62.6	71.9
55-59	65.2	73.3
60-64	54.4	60.6
65-69	49.1	54.6
20-69	**60.6**	**72.2**

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, with many countries having a three-year screening interval. Australian policy advises a two-year screening cycle for women who have had a negative Pap smear[5]. While discussion continues around the optimal length of screening intervals, there is a recognised need for the development of health systems to identify and actively target two important groups. They consist of women who have never been screened and women who have not been screened for more than four years (underscreened).

It can be seen from Table 4.4 that a high proportion of women aged 25 to 59 years were screened at least once in the three-year period 2004-06. This is consistent with previous years. Women aged 20-24 and women over 59 years of age appear to have a low level of participation in both the two-year and three-year periods.

4.2.1 Practice Incentive Program (PIP)

Implementation of the 2001 Federal Cervical Screening Budget Initiative, which built on the existing Practice Incentives Program, attempted to contribute to addressing the issue of underscreened women through incentives for general practitioners (GPs) when screening women who have not had a Pap smear in the past four years.

[5] *National policy of the National Cervical Screening Program (NCSP).*

In November 2003, a system was introduced whereby a GP could submit a PIP Data Request Form and receive from the CCR a list of women for whom they were the last known care provider and who have not had a Pap smear in the past four years. Completed lists are provided to the GP directly or through the relevant GP Divisional Representative, according to their preference.

The main goals of this project are to improve participation rates in cervical screening of underscreened women; to raise the profile of the WACCPP and to provide much needed support to GPs in the community.

The number of women identified on PIP lists for GPs in 2003, 2004, 2005 and 2006 is shown in Table 4.5. Note that the first lists were sent in November 2003. Also shown is the number and percentage of women who were followed up within three months of their name being sent to a GP who was their last known care provider. The high number of women identified for PIP in 2004 can be attributed to increased awareness of this initiative at the outset of the incentive program. The decline over time in the requests from GPs may reflect increasing adoption by GPs of their own Pap smear reminder systems.

Table 4.5 Outcome of PIP lists sent by the CCR during 2003-2006

Year	Number of women	Follow-up within three months of letter	Percentage
2003	2,188	112	5.1
2004	13,869	604	4.4
2005	1,045	50	4.8
2006	604	29	4.8

4.3 Comparison of metropolitan and country participation

Table 4.6 and Figure 4.1 compare 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[6].

Table 4.6 demonstrates that for all ten two-year 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 difference between metropolitan and country areas has reached an all time high in the 2005-06 period, where a 2.9% difference in participation rates was reported.

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 for all ten two-year periods.

[6] *Postcode Allocation, Epidemiology, Health Information Centre, Department of Health WA.*

Table 4.6 Estimated percentage of women by age group with an intact uterus who had at least one Pap smear for the two-year periods between 1996-1997 and 2005-2006: comparison of the Perth metropolitan area with country WA

Age group		Percentage of women screened									
		1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
20 – 24	Metro	55.3	54.4	53.2	49.4	50.3	51.2	49.8	49.4	50.1	50.3
	Country	60.8	61.7	60.1	54.8	54.1	54.6	54.1	52.7	53.6	54.1
25 – 29	Metro	67.8	68.2	67.1	62.6	62.2	61.6	60.1	59.1	58.5	58.3
	Country	66.2	67.8	66.1	61.5	60.6	59.8	58.9	57.6	56.0	56.1
30 – 34	Metro	70.1	71.4	71.4	68.4	67.1	64.9	64.5	63.9	63.7	63.5
	Country	65.9	67.6	66.0	62.2	62.5	61.6	60.8	60.4	58.9	58.5
35 – 39	Metro	69.1	70.4	69.8	67.1	67.0	64.9	64.6	64.3	64.9	64.9
	Country	64.9	67.7	66.9	64.3	63.0	61.9	62.1	60.1	60.1	59.8
40 – 44	Metro	66.6	67.2	67.1	65.6	65.3	64.0	64.1	63.1	63.7	64.5
	Country	61.5	63.4	63.9	62.9	62.8	62.4	63.1	62.6	61.8	60.4
45 – 49	Metro	64.8	65.9	66.0	64.6	65.0	64.3	64.7	64.6	65.3	65.4
	Country	61.5	63.3	62.3	61.6	60.3	60.2	62.5	62.2	61.6	61.6
50 – 54	Metro	63.2	62.8	63.1	63.2	62.6	61.6	61.8	61.8	62.5	63.0
	Country	59.3	59.6	59.7	59.5	58.3	57.9	57.9	57.3	57.7	57.3
55 – 59	Metro	59.4	63.0	63.5	62.7	62.9	62.9	63.0	63.1	64.5	65.1
	Country	58.8	61.8	61.1	60.8	61.1	59.2	60.3	60.5	60.0	60.6
60 – 64	Metro	51.1	54.4	55.6	55.1	55.2	54.0	53.4	53.5	53.7	54.3
	Country	52.7	55.4	55.9	56.0	55.1	52.5	54.4	53.2	51.8	51.2
65 – 69	Metro	40.7	44.8	46.4	45.9	46.9	46.3	47.2	47.2	48.2	48.9
	Country	39.1	44.3	46.4	45.3	45.1	46.6	47.2	47.8	47.7	47.6
20 – 69	**Metro**	**63.4**	**64.4**	**64.1**	**61.8**	**61.7**	**60.8**	**60.4**	**59.9**	**60.3**	**60.6**
	Country	**61.9**	**63.8**	**63.0**	**60.4**	**59.8**	**59.2**	**59.4**	**58.6**	**58.0**	**57.7**

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

Figure 4.1 Estimated percentage of women by age group with an intact uterus who had at least one Pap smear for the two-year period 2005-2006: comparison of the Perth metropolitan area with country WA

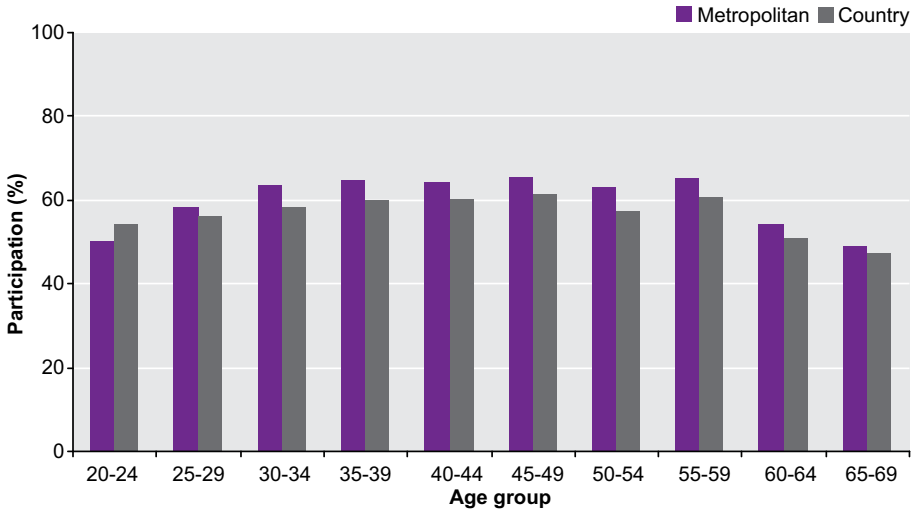
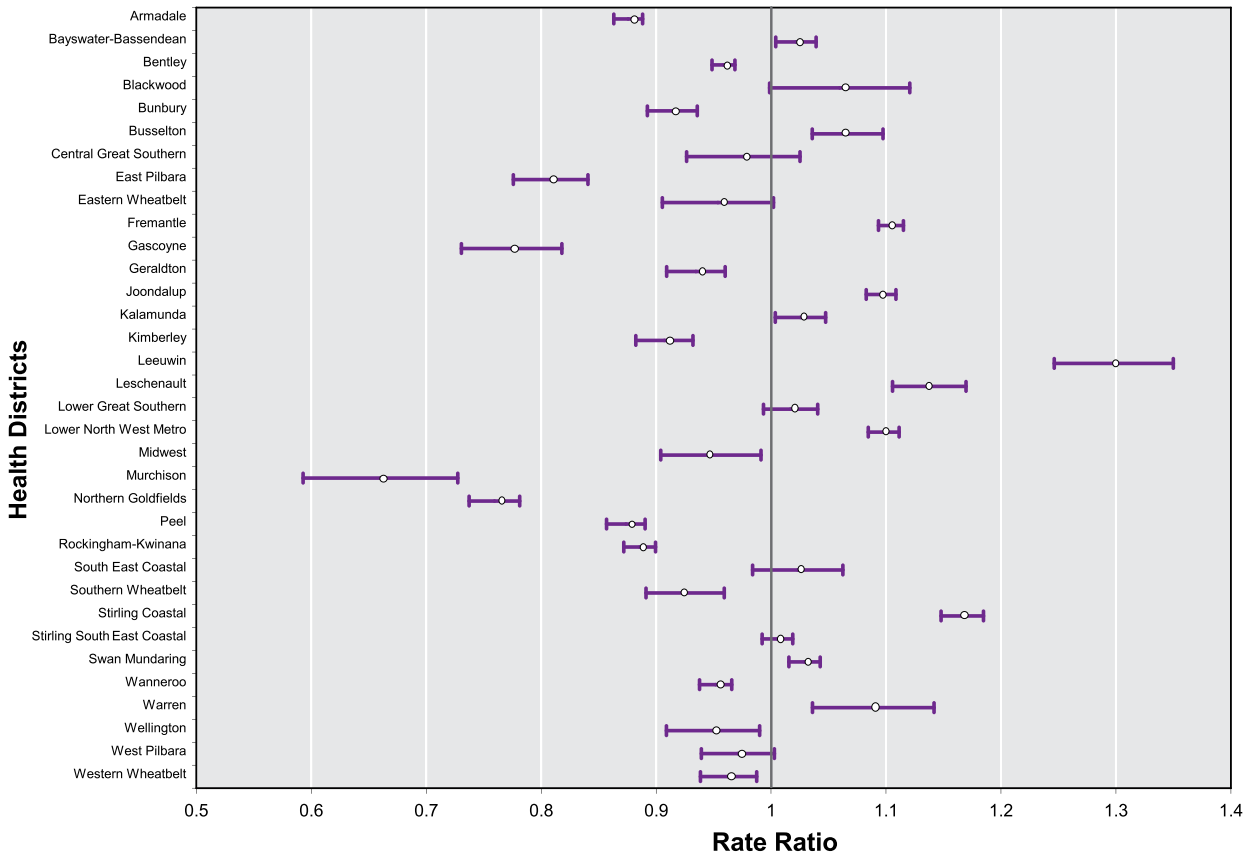


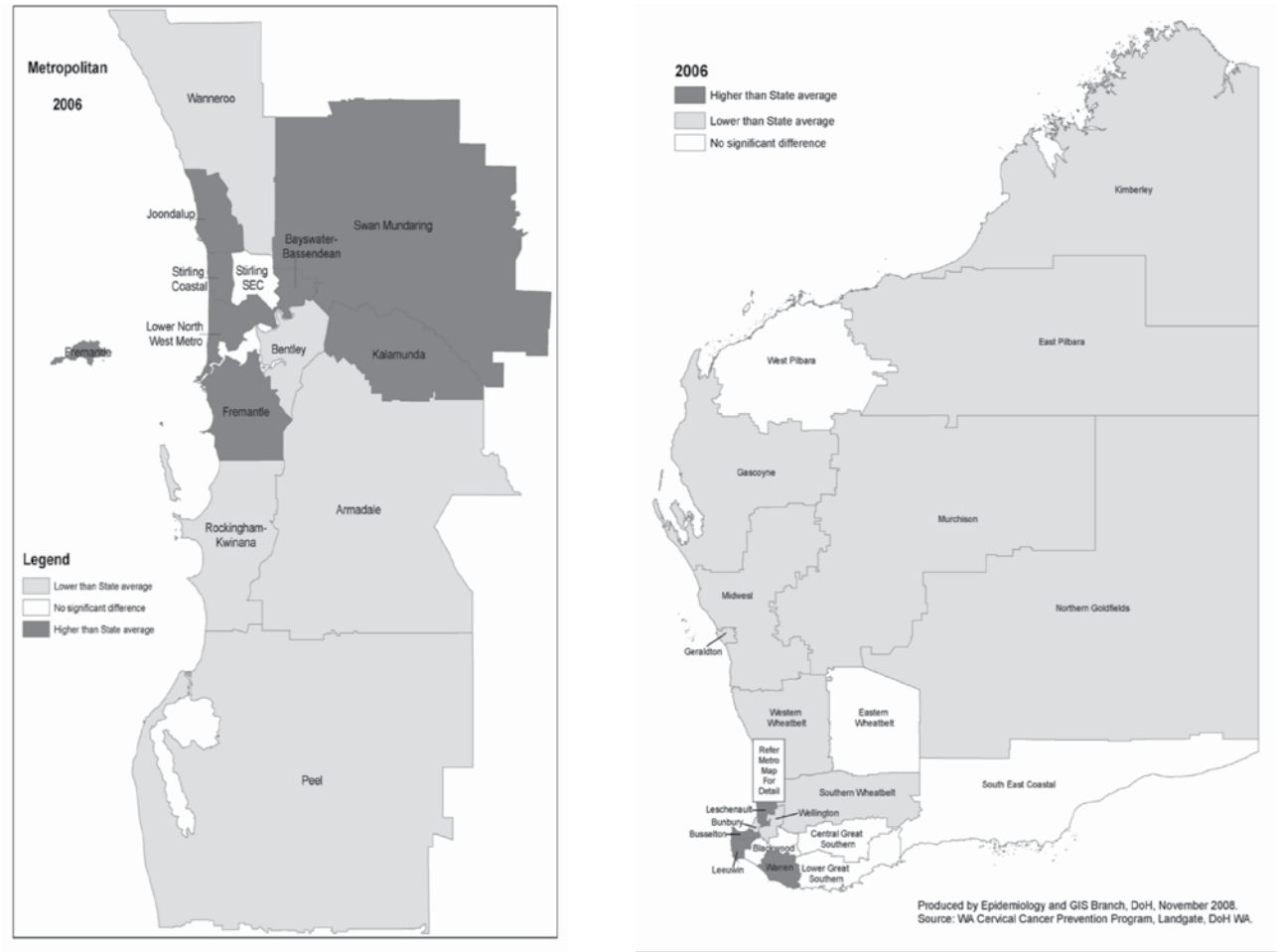
Figure 4.2 Rate ratios of cervical screening participation by Health District for WA 2005-06



Note: Bars on graph represent 95% confidence intervals.

Bars completely to the right of the vertical line represent Health District participation rates that are significantly higher than the State rate. Bars completely to the left of the vertical line represent Health District participation rates that are significantly lower than the State rate.

Figure 4.3 Geographical view of cervical screening participation by Health District for WA 2005-06



From Figure 4.2 and 4.3 it can be seen that Armadale, Bentley, Bunbury, East Pilbara, Gascoyne, Geraldton, Kimberley, Midwest, Murchison, Northern Goldfields, Peel, Rockingham-Kwinana, Southern Wheatbelt, Wanneroo, Wellington and Western Wheatbelt Health Districts all experienced cervical screening participation rates lower than the State rate, and that these rates were statistically significant. It should be noted that the areas with particularly low participation rates (Murchison, Gascoyne, Northern Goldfields and East Pilbara) are all areas with high proportions of Indigenous women.

It is also evident that Bayswater-Bassendean, Busselton, Fremantle, Joondalup, Kalamunda, Leeuwin, Leschenault, Lower North West Metro, Stirling Coastal, Swan Mundaring and Warren Health Districts experienced statistically significant higher rates than the State rate.

Figure 4.3 also highlights Health Districts with screening rates that were not significantly different to the State rate. In 2006 these were Blackwood, Central Great Southern, Eastern Wheatbelt, Lower Great Southern, South East Coastal (SEC), Stirling SEC and West Pilbara.

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 Pap smear result taken in February 2005).

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)	11,430	82.4
1	2,353	16.9
2	90	0.6
3	5	< 0.1
4	1	< 0.1
5 or more	0	0.0
Total	**13,879**	**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.

A total of 82.4% of women did not have subsequent smears performed over the selected 21-month period meaning 17.6% of women were re-screened early. The previous year's figures were 80.7% and 19.3% respectively. In both 2004 and 2005 less than 1% of the early re-screened women exceeded one repeat smear. In 2006 this figure was 0.7%.

Prior to 2001 these figures were not directly comparable due to a change in definition of 'early re-screening' by the NCSP. 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. Improvements to the Register have enabled the extraction of data that provides a clearer picture of women who are re-screening outside of NHMRC guidelines. Clinical reasons and/or symptoms for subsequent Pap smears within two years are not recorded in the Register.

6. Cytology (Pap smear) reports

Pap smear results are coded according to standard CCR report categories (see Appendix A – Cytology Codes). Report categories consist of a combination of results observed for a range of cell types. The coding for report categories reflects the changes in coding used in the revised NHMRC guidelines for the management of screen detected abnormalities, in use from July 1st, 2006.

Table 6.1 summarises the profile of cytology reports for women of all ages across all laboratories combined and the range among the various laboratories. In 2006, 89.8% of smears were reported as normal, 6.6% indicated as either possible or definite low-grade abnormality and 1.4% 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 clinicians investigating women with abnormalities.

Table 6.1 Cytology report categories 2006

Cytology report category	Number	All laboratories (%)	Range (%)
Unsatisfactory smear	4,714	2.2	0.5 - 4.4
Normal smear	188,041	89.8	36.9 - 93.5
Possible LGEA/LGEA *	13,825	6.6	4.9 - 51.1
Possible high-grade epithelial abnormality	1,151	0.6	0.3 - 1.1
High-grade epithelial abnormality	1,607	0.8	0.4 - 9.2
Malignant	43	<0.1	0.0 - 0.4
Total	**209,381**	**100**	

* Low-grade epithelial abnormality

Note: Includes reports for women with an address in WA at the time of the test. Excludes reports after the date of hysterectomy or from the initial vault smear i.e. post-hysterectomy.

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 2.2%, which is in accordance with the *Royal College of Pathologists of Australasia (RCPA)* performance standards[7]. The percentage of abnormal squamous cell categories (includes all categories from possible low-grade squamous intraepithelial lesion (LSIL) up to squamous carcinoma) reported was 7.8%. In 2005 this figure was 8.1%.

[7] *Royal College of Pathologists of Australasia (RCPA) Performance Standards for Gynaecological Cytology.*

Table 6.2 Squamous cell categories 2006

Squamous cell category	Number	All laboratories (%)	Range (%)
Unsatisfactory	4,714	2.2	0.5 - 4.4
No abnormality	188,320	89.9	37.2 - 93.6
Possible LSIL	9,552	4.6	3.4 - 32.7
LSIL (HPV and/or CIN I)	4,145	2.0	1.4 - 18.1
Possible HSIL*	1,053	0.5	0.3 - 1.1
HSIL (CIN II/CIN III)	1,554	0.7	0.4 - 8.5
HSIL with possible microinvasion/invasion	32	<0.1	0.0 - 0.7
Squamous carcinoma	11	<0.1	0.0 - 0.0
Total	**209,381**	**100**	

* High-grade squamous intraepithelial lesion.

Table 6.3 Endocervical cell categories 2006

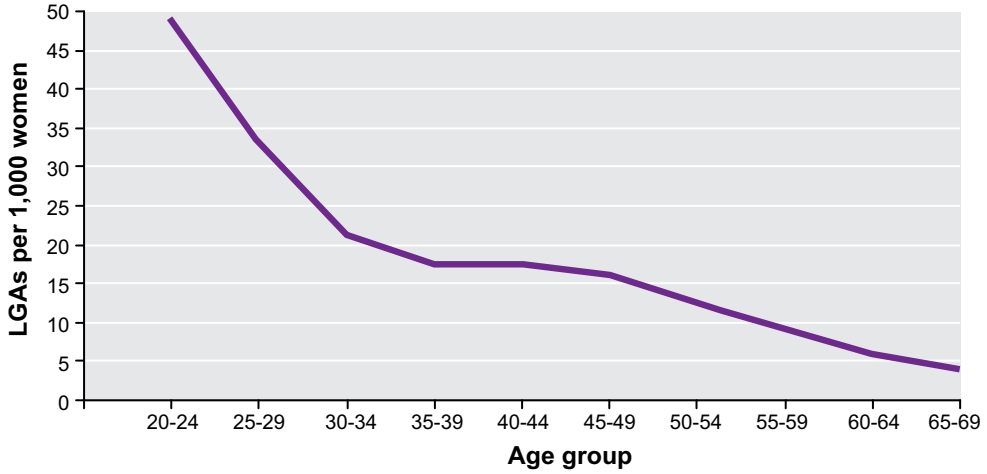
Endocervical cell category	Number	All laboratories (%)	Range (%)
Unsatisfactory	4,205	2.0	0.5 - 4.4
No endocervical cells	44,527	21.3	5.5 - 26.3
No abnormal endocervical cells	160,304	76.6	72.0 - 91.0
Atypical endocervical cells	181	<0.1	0.0 - 3.0
Possible adenocarcinoma-in-situ (AIS)	120	<0.1	0.0 - 0.2
AIS	29	<0.1	0.0 - 0.1
AIS with possible microinvasion/invasion	3	<0.1	0.0 - 0.0
Adenocarcinoma	12	<0.1	0.0 - 0.1
Total	**209,381**	**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) were reported in 0.2% of smears and possible or definite high-grade glandular abnormalities in less than 0.1%. These figures are consistent with 2005 results.

In 2006, an endocervical component was absent in 21.3% of smears compared with 21.5% in the 2005 calendar year. The absence of endocervical cells on a Pap smear may be due to a number of factors (including the adequacy of the sampling of the transformation zone).

The proportion of Pap smears with an endocervical component has decreased over the life of the Register by approximately 10 percentage points. Decreases have also been seen in other states and territories. The reason for the decreasing proportion of Pap smears with an endocervical component is unclear.

Figure 6.1 Age-specific low-grade abnormality rates in women aged 20-69 years WA 2006

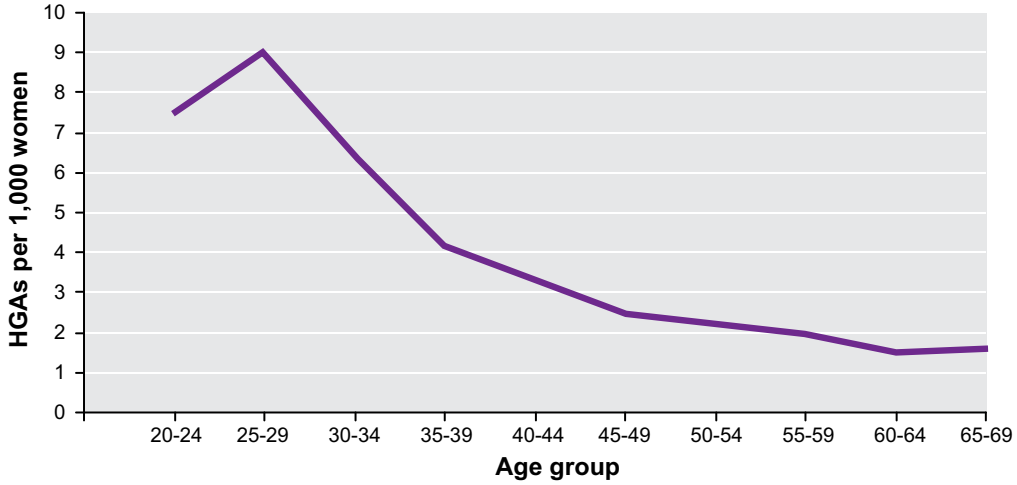


Note: A low-grade abnormality is defined as: Possible LGEA/LGEA (S2, S3 [CIN I], E2, O2 or O3). Includes Human Papilloma Virus (HPV) effect alone and atypia of uncertain significance. Rates are expressed per 1,000 women.

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 higher for females aged between 20-29 years than for any other age group.

Figure 6.2 Age-specific high-grade abnormality rates in women aged 20-69 years WA 2006



Note: A high-grade abnormality is defined as:
Possible HGEA (S4, E3, O4 or O5); HGEA (S5 [CIN II/CIN III], S6, E4 or E5); Malignant (S7, E6, O6, O7, O8 or O9).
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

7.1 Introductory letter

Beginning in August 2003, the CCR has sent an introductory letter to women whose details are received for the first time. This letter is designed to educate women in the community of the CCR's role and the services it provides, thereby raising awareness of the WACCPP within the State and raising awareness of the importance of regular cervical cancer screening. The letter also serves to ensure CCR records are up to date with regards to women's name and address details and to provide an opportunity for women to make an informed choice to not be included in the Register (opt off).

Since its introduction, 1,035 introductory letters have been sent to women in WA for the 2003 calendar year; 5,598 letters were sent out in 2004, 3,864 letters were sent out in 2005 and 13,910 letters were sent out in 2006. The large increase in 2006 was due to a data processing backlog, whereby some late 2005 results were not entered into the Register until early 2006, due to resourcing issues. Of the 30 women whose identifying information was withdrawn from the Register in 2006, at their request, 10 were in response to the receipt of an introductory letter. It should be noted that in 2006, the proportion of women opting off is <0.1%.

7.2 Protocol of Actions

An important function of the CCR is to provide a 'safety net' to help ensure that women with abnormal results are appropriately followed up. The CCR has a series of protocols for the generation of letters to practitioners and/or women depending on the most recent Pap smear or biopsy result. Table 7.1 outlines the CCR's *Protocol of Actions*. Letters to women with normal results are called reminder letters, reminding them when they are overdue for their next Pap smear; letters sent to providers and women in connection with abnormal Pap smears are called follow-up letters.

The *Protocol of Actions* for follow-up are reviewed and amended regularly as recommended by the WACCPP Advisory Group. As of January 2005 the timeframes for follow-up letters after a biopsy report were amended. For unsatisfactory, normal or low-grade histological abnormalities, the timing of the follow-up letter to the provider was reduced from 24 months to 18 months and that to the woman reduced from 30 months to 24 months. For high-grade histological abnormalities including invasive malignancy the timeframes for follow-up letters to providers were amended from 24 months to 12 months and to women from 30 months to 18 months.

The CCR is updated monthly with information from the WA Death Registry to minimise the risk of reminder and/or follow-up letters being sent to deceased women.

The CCR allows for withholding of follow-up letters on the advice of a woman's service provider. For example, when the CCR has been advised of a woman's pregnancy and her expected date of delivery a letter is normally sent six months after this date (if no further follow-up information is received).

Table 7.1 CCR Protocol of Actions

Cytology (Pap smear) report	Action
	If no follow-up information is received by the CCR:
Unsatisfactory	▪ Letter to the provider at 6 months; ▪ Letter to the woman at 12 months if no **further** follow-up information received.
Normal	▪ Reminder letter to the woman at 30 months unless hysterectomy is known.
Possible low-grade abnormality/low-grade abnormality	▪ Letter to the provider at 18 months; ▪ Letter to the woman at 24 months if no **further** follow-up information received.
Possible high-grade abnormality/high-grade abnormality	▪ Questionnaire letter to the provider at 9 months; ▪ Letter to the woman at 12 months if no **further** follow-up information received; ▪ If still no **further** follow-up information received, letter (registered post with delivery confirmation) to the woman at 15 months.
Histopathology (biopsy) report	**Action**
	If no follow-up information is received by the CCR:
Unsatisfactory, normal, low-grade abnormality	▪ Letter to the provider at 18 months; ▪ Letter to the woman at 24 months if no **further** follow-up information received.
High-grade abnormality	▪ Letter to the provider at 12 months; ▪ Letter to the woman at 18 months if no **further** follow-up information received.

7.3 Reminders to women with normal Pap smears

A reminder letter is sent to women whose last Pap smear result was normal and for whom no further smear has been recorded within a thirty-month period. In the 2006 calendar year, 72,190 reminder letters were sent to women following a normal smear. This figure was 89,303 in 2005. Of these women, 22.4% had a follow-up smear within three months of the reminder letter being sent (see Table 7.2). This level of response is similar to that seen in the previous year (21.9%).

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

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

In 2006, a total of 5,417 follow-up letters pertaining to unsatisfactory and abnormal Pap smears were sent to providers and 2,588 letters were sent to women.

Table 7.2 displays the outcome of the reminder and follow-up letters. Follow-up letters are sent directly to the woman only if the CCR has not received follow-up information. It is important to note that Table 7.2 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 74,778 letters sent to women in 2006, approximately 12% were returned to sender, indicating that the woman had changed address since the time of her most recent smear. This is an improvement on 2005, where 15% of the 91,576 letters sent to women were returned to sender.

Table 7.2 Outcome of reminder and follow-up Pap smear letters sent by the CCR in 2006

Letter type	Number of letters sent**	Follow-up within three months of letter	
		Number	Percentage
'Normal' to woman	72,190	16,188	22.4
'Unsatisfactory' to provider	2,330	705	30.3
'Unsatisfactory' to woman	905	211	23.3
'Low-grade abnormality' to provider	2,730	626	22.9
'Low-grade abnormality' to woman	1,433	284	19.8
'High-grade abnormality'* to provider	357	110	30.8
'High-grade abnormality'* to woman	174	45	25.9
2nd 'high-grade abnormality' to woman	76	20	26.3

* *'High-grade abnormality' includes results categorised as 'Possible High-grade Epithelial Abnormality and Malignant'.*

** *This refers only to reminder and follow-up letters generated in 2006. The number of letters shown as sent to women is less than the number of women who were, as letters continued to be sent into 2007.*

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. 175 women with a finding of possible high-grade or high-grade abnormality (including malignant) 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 56 women with possible or definite high-grade abnormalities (including malignant) during 2006. The *Protocol of Actions* and various other methods, including requesting information from Medicare Australia, were utilised in obtaining further follow-up information. According to information since received into the Register, 34 of these women have now been re-screened. Further attempts to locate the remaining 22 women who are lost to follow-up are carried out periodically.

7.5 Follow-up letters for biopsy results

According to the CCR's *Protocol of Actions* (Table 7.1) the follow-up of unsatisfactory, normal and low-grade abnormal cervical biopsies is to send a letter to the provider at 18 months. For high-grade abnormal cervical biopsies, a letter is sent to the provider at 12 months. If follow-up information is not received within a further 6 months, a subsequent follow-up letter is sent directly to the woman. Various databases are searched for a current address when locating women.

In 2006, a total of 1,178 follow-up letters pertaining to unsatisfactory, normal and low-grade abnormal cervical biopsies were sent to providers and 632 letters were sent to women. For biopsy reports of high-grade abnormalities (including invasive malignancies), 273 follow-up letters were sent to providers and 127 letters were sent to women.

Table 7.3 displays the outcome of these follow-up letters, once again demonstrating the 'safety net' function of the CCR. There were 440 women who had either a Pap smear or biopsy within three months of the letter to their provider or themselves. This represents 19.9% of women sent a letter and is consistent with figures from previous years.

Table 7.3 Outcome of follow-up biopsy letters sent by the CCR in 2006

Letter type	Number of letters sent**	Follow-up within three months of letter	
		Number	Percentage
'Unsatisfactory, normal, low-grade abnormality' to provider	1178	212	18.0
'Unsatisfactory, normal, low-grade abnormality' to woman	632	151	23.9
'High-grade abnormality'* to provider	273	55	20.1
'High-grade abnormality'* to woman	127	22	17.3

** *This refers only to follow-up letters generated in 2006. The number of letters shown as sent to women is less than the number of women who were overdue for follow-up, as letters continued to be sent into 2007.*

* *'High-grade abnormality' includes results categorised as 'Invasive Malignancy'.*

8. Histopathology (biopsy) reports

The CCR collects information relevant to cervical biopsies. In 2006, a total of 6,845 women had at least one cervical biopsy. Corresponding figures for 2003 were 9,576; for 2004 were 8,401; and for 2005 were 7,457, respectively. Table 8.1 shows biopsies by report category for women of all ages.

Table 8.1 Biopsy report categories 2006

Biopsy report category	Number	Percentage
Unsatisfactory biopsy	71	0.9
Normal biopsy (no abnormality reported)	3,698	46.0
Low-grade intraepithelial abnormality	1,844	22.9
High-grade intraepithelial abnormality	2,207	27.4
Invasive malignancy	223	2.8
Total	**8,043**	**100**

Note: As some women had more than one biopsy in 2006, 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 46.0% of biopsies (compared with 47.3% in 2005), 22.9% showed the presence of a low-grade intraepithelial abnormality (25.3% in 2005) and 27.4% of biopsies revealed a high-grade intraepithelial abnormality (23.6% in 2005). Invasive malignancy was shown in 2.8% of biopsies (2.9% in 2005). Overall, these figures represent a decrease in the number of biopsies performed (727 fewer biopsies than 2005: 8.29% decrease), but a higher proportion of abnormalities found (53.1% in 2006 compared with 51.8% in 2005). Refer to Appendix B – Histology Codes.

9. Cytology and histopathology correlation

The CCR provides information about the correlation of cytology and histopathology results to assist with quality control in pathology laboratories. In 2006, 1,607 Pap smears were reported as having a high-grade epithelial abnormality, whilst 1,151 Pap smears were reported as possible high-grade epithelial abnormality, in WA. Of the high-grade cases, 1,386 (86.2%) had a follow-up biopsy within six months. Of the possible high-grade reports, 827 (71.9%) had a follow-up biopsy within six months.

Table 9.1 shows that in 2006, in 10.8% of cases in WA the biopsies were negative or benign while 16.0% showed a low-grade intraepithelial abnormality. Histology reports confirmed the cytology finding of a high-grade intraepithelial abnormality in 71.2% of cases. Invasive malignancy was present in 1.3% of cases. In 2005, 68.4% of histology reports in WA confirmed the cytology finding of a high-grade intraepithelial abnormality and invasive malignancy was present in 2.0% of cases. A comparison of WA and national figures is given in Table 9.1.

Table 9.1 Biopsy reports within six months following high-grade abnormality on cytology 2006: comparison of WA and national figures

Biopsy report	State number	State percentage	National* (%)	National* range (%)
Unsatisfactory specimens	10	0.7	0.3	0.0 - 3.0
Negative/benign findings	150	10.8	8.7	0.0 - 33.3
Low-grade intraepithelial abnormality	222	16.0	15.7	0.0 - 33.3
High-grade intraepithelial abnormality	986	71.2	73.5	33.3 - 100.0
Invasive malignancy	18	1.3	1.8	0.0 - 17.8
Total	**1,386**	**100**		

* *Includes national aggregate percentages and range taken from RCPA Cytopathology Quality Assurance Program 2007 for Performance Measure 3a; Accuracy of reports predicting high-grade abnormality (Data for January 1 to December 31, 2006).*

Table 9.2 shows that in 2006, in 29.6% of cases in WA the biopsies were negative or benign while 28.4% showed a low-grade intraepithelial abnormality. Of the cytological findings of a possible high-grade intraepithelial abnormality, 39.7% of histology reports confirmed the suspected lesion as high-grade. Invasive malignancy was present in 1.5% of cases. In 2005, 38.7% of histology reports in WA confirmed the cytology finding of a possible high-grade intraepithelial abnormality as high-grade and invasive malignancy was present in 1.3% of cases. Table 9.2 provides an assessment of WA and national figures.

Table 9.2 Biopsy reports within six months following possible high-grade abnormality on cytology 2006: comparison of WA and national figures

Biopsy report	State number	State percentage	National* (%)	National* range (%)		
Unsatisfactory specimens	7	0.8	0.9	0.0	-	9.1
Negative/benign findings	245	29.6	25.4	0.0	-	57.1
Low-grade intraepithelial abnormality	235	28.4	26.1	0.0	-	100.0
High-grade intraepithelial abnormality	328	39.7	46.2	0.0	-	100.0
Invasive malignancy	12	1.5	1.4	0.0	-	12.5
Total	**827**	**100**				

* *Includes national aggregate percentages and range taken from RCPA Cytopathology Quality Assurance Program 2007 for Performance Measure 3b; Accuracy of reports of possible high-grade abnormality (Data for January 1 to December 31, 2006).*

9.1 Correlation between cytology and histopathology reports

The following tables (Tables 9.3 and 9.4) attempt 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 these tables represent for each eligible woman in 2006, the most severe cervical abnormality detected via a Pap smear and the most severe histological follow-up in the subsequent six months after that Pap smear. A hierarchical ranking was used to select the most severe Pap smear for individual women and the most severe biopsy. It should also be noted that Pap smears showing atypia and HPV effect are not normally followed up by biopsy. Proportions should be interpreted carefully, as some predictions involve small numbers.

Where a smear demonstrates both squamous and glandular abnormalities it is presented in the glandular table if the glandular abnormality is of an equivalent or higher severity than the squamous abnormality. If the squamous abnormality is of a higher severity than the glandular abnormality then it is included in the squamous table.

The CCR does not collect information relating to colposcopy. Follow-up that may have involved this investigation alone is therefore not included in the following tables. It is also recognised that 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. Histology findings with no preceding Pap smears have been excluded from the following data in Tables 9.3 and 9.4.

Positive Predictive Value For Table 9.3

For Table 9.3, high-grade squamous or combined squamous and glandular abnormalities where the squamous component is the most severe abnormality on smears, the positive predictive value ([PPV] proportion of those with a predicted abnormality in whom a high-grade abnormality was confirmed on biopsy) was as follows:

- Possible HSIL 40.8%
- HSIL 75.0%
- Possible SCC 93.3%
- SCC 100.0%

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

HISTOLOGY FINDINGS	CYTOLOGY PREDICTIONS											
	Squamous Atypia Total = 8,103[8]		HPV and/or CIN1 Total = 3,645[8]		Possible HSIL[1] Total = 864[8]		HSIL[2] Total = 1,386[8]		Possible SCC[4] Total = 31[8]		SCC[5] Total = 10[8]	
UNSATISFACTORY	10	1.3%	6	0.7%	5	0.8%	7	0.6%				
NORMAL	353	45.0%	217	26.0%	175	27.9%	102	8.6%				
ATYPIA	132	16.9%	107	12.8%	69	11.0%	49	4.2%				
HPV	91	11.6%	123	14.8%	45	7.2%	34	2.9%	1	3.3%		
CIN I	100	12.8%	246	29.5%	77	12.3%	103	8.7%	1	3.3%		
CIN II	62	7.9%	96	11.5%	133	21.2%	285	24.2%	1	3.3%		
CIN III	26	3.3%	32	3.8%	112	17.9%	562	47.7%	14	46.7%	1	11.1%
CIN III + AIS[3]	2	0.3%	2	0.2%	5	0.8%	17	1.4%				
AIS[3]	2	0.3%	3	0.4%	1	0.2%	6	0.5%				
SCC[5]	2	0.3%			2	0.3%	13	1.1%	11	36.7%	5	55.6%
AdenoCa Cx[6]					1	0.2%	1	0.1%	2	6.7%	2	22.2%
SCC[5] + AdenoCa Cx[6]											1	11.1%
Other Carcinomas[7]	4	0.5%	1	0.1%	2	0.3%	1	0.1%				
Total with biopsy follow-up	**784**	**100%**	**833**	**100%**	**627**	**100%**	**1,180**	**100%**	**30**	**100%**	**9**	**100%**
No biopsy follow-up recorded at CCR within six months of index smear	7,319		2,812		237		206		1		1	

* This table includes those combined squamous and glandular abnormalities where the squamous component is the most severe abnormality

Notes:
[1] Possible high-grade squamous intraepithelial lesion
[2] High-grade squamous intraepithelial lesion
[3] Adenocarcinoma-in-situ
[4] Possible squamous cell carcinoma
[5] Squamous cell carcinoma
[6] Adenocarcinoma of cervix
[7] Endometrial, vaginal or ovarian cancer
[8] Total number of cases with and without biopsy follow-up

Table 9.4 Correlation between cytology and histopathology reports for glandular and combined* glandular and squamous abnormalities on Pap smears with histology findings within six months

	CYTOLOGY PREDICTIONS									
HISTOLOGY FINDINGS	**Endocervical Atypia Total = 158[7]**		**Possible AIS[1] Total = 109[7]**		**AIS[2] Total = 23[7]**		**Possible AdenoCa Cx[3] Total = 3[7]**		**AdenoCa Cx[4] Total = 12[7]**	
UNSATISFACTORY			2	2.7%					1	12.5%
NORMAL	22	55.0%	28	38.4%						
ATYPIA	6	15.0%	6	8.2%						
HPV			4	5.5%						
CIN I	3	7.5%	3	4.1%						
CIN II	2	5.0%	3	4.1%						
CIN III	4	10.0%	10	13.7%	3	13.6%				
CIN III + AIS[2]	1	2.5%	2	2.7%	4	18.2%				
AIS[2]	1	2.5%	7	9.6%	13	59.1%	2	66.7%		
SCC[5]			1	1.4%						
AdenoCa Cx[4]			2	2.7%	2	9.1%	1	33.3%	5	62.5%
SCC[5] + AdenoCa Cx[4]										
Other Carcinomas[6]	1	2.5%	5	6.8%					2	25.0%
Total with biopsy follow-up	**40**	**100%**	**73**	**100%**	**22**	**100%**	**3**	**100%**	**8**	**100%**
No biopsy follow-up recorded at CCR within six months of index smear	118		36		1		0		4	

* This table includes those combined glandular and squamous abnormalities where the glandular component is the more severe abnormality or of equal severity

Notes:
[1] Possible adenocarcinoma-in-situ
[2] Adenocarcinoma-in-situ
[3] Possible adenocarcinoma of cervix
[4] Adenocarcinoma of cervix
[5] Squamous cell carcinoma
[6] Endometrial, vaginal or ovarian cancer
[7] Total number of cases with and without biopsy follow-up

Positive Predictive Value For Table 9.4

Pap smears reporting glandular abnormalities or where a glandular abnormality is of an equivalent or higher severity than the squamous abnormality are analysed in Table 9.4. As with Table 9.3, caution should be exercised when evaluating figures where small numbers are specified.

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

- Possible AIS 41.1%
- AIS 100.0%
- Possible AdenoCa Cx 100.0%
- AdenoCa Cx 87.5%

List of Abbreviations

ABS	Australian Bureau of Statistics
AdenoCa	Adenocarcinoma
AIHW	Australian Institute of Health and Welfare
AIS	Adenocarcinoma-In-Situ
CIN	Cervical Intraepithelial Neoplasia
CIS	Carcinoma In-Situ
CCR	Cervical Cytology Registry
Cx	Cervix
DoH	Department of Health (WA)
ERP	Estimated Resident Population
GIS	Geographical Information Systems
GP	General Practitioner
HGA	High-grade Abnormality
HGEA	High-grade Epithelial Abnormality
HPV	Human Papilloma Virus
HSIL	High-grade Squamous Intraepithelial Lesion
LGA	Low-grade Abnormality
LGEA	Low-grade Epithelial Abnormality
LSIL	Low-grade Squamous Intraepithelial Lesion
NCSP	National Cervical Screening Program
NHMRC	National Health and Medical Research Council
NPAAC	National Pathology Accreditation Advisory Council
PIP	Practice Incentive Program
Poss HSIL	Possible High-grade Squamous Intraepithelial Lesion
Poss AIS	Possible Adenocarcinoma-In-Situ
RCPA	Royal College of Pathologists of Australasia
SCC	Squamous Cell Carcinoma
WA	Western Australia
WACCPP	Western Australian Cervical Cancer Prevention Program

Glossary

Adenocarcinoma-in-situ: A localised growth of abnormal glandular tissue that may become malignant.

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 World Standard Population[1]).

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.

Asymptomatic: A term used to describe an individual who does not currently show symptoms of the disease.

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.

Cervical biopsy: The removal of cervical tissue for microscopic examination.

Cervical cancer: Cancer of the entrance to the womb (uterus).

Cervix: The opening of the uterus, at the top of the vagina.

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

CIN I (Mild dysplasia): Dysplastic cells occupy the lower third of the epithelium.

CIN II (Moderate dysplasia): Dysplastic cells occupy up to the middle third of the epithelium.

CIN III (Severe dysplasia): Dysplastic cells occupy the full thickness of the epithelium.

Colposcopy: A medical diagnostic procedure to examine an illuminated, magnified view of the cervix and the tissues of the vagina and vulva.

Country: Rural and remote regions of WA.

Cytology: The study of cells, including their formation, origin, structure, function, biochemical activities, and pathologic characteristics.

Ectocervix: The portion of the cervix extending into the the vagina.

Endocervix: The portion of the cervix extending into the uterine cavity.

Epidemiology: The study of the distribution and pattern of diseases in a population to determine or trace the circumstances or events causing them.

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

[1] Segi M (1960) Cancer mortality for selected sites in 24 countries (1950-1957). Sendai, Japan, Tohoku University Press.

HPV effect: Cellular changes due to Human Papilloma Virus.

Hysterectomy: An operation to remove the uterus.

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

Low-grade abnormality - Pap smear: HPV effect alone; CIN I; or atypical endocervical cells.

Malignant/invasive: Carcinoma; squamous carcinoma; or adenocarcinoma.

Metropolitan: The city of Perth and its surrounding suburbs.

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.

Normal smear: A Pap smear with no abnormalities.

Pathology: The scientific study of the nature, origin, progress and cause of disease.

Pap smear: Primarily a test to help prevent cervical cancer. A small spatula or a cytobrush (a soft nylon brush) is used to take a small sample of cells from the cervix. These cells are then sent to a laboratory where they are examined under a microscope.

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

Possible low-grade - Pap smear: Mild cellular changes, including minor squamous atypia - raising the possibility of low-grade lesion.

Positive Predictive Value (PPV): Proportion of those with a predicted cytological abnormality in whom a high-grade abnormality was confirmed on biopsy.

Squamous carcinoma: Cancer found in the squamous cells, e.g. the lining of the ectocervix.

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

Uterus: Also known as the womb. A hollow, muscular organ of females in which the ovum is deposited and the embryo and fetus are developed.

Appendix A – Cytology Codes

C Category	S	Squamous Cell	E	Endocervical	O	Other/ Non-cervical
CU Unsatisfactory	SU	Unsatisfactory for evaluation e.g. poor cellularity, poor preservation, cell detail obscured by inflammation/blood/degenerate cells	EU	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	E-	Not applicable: vault smear/previous hysterectomy	O1	No other abnormal cells
			EØ	No endocervical component		
			E1	Endocervical component present. No abnormality or only reactive changes		
C2 Possible LGEA/ LGEA	S2	Possible low-grade squamous intraepithelial lesion (LSIL)	E2	Atypical endocervical cells of uncertain significance	O2	Atypical endometrial cells of uncertain significance
	S3	LSIL (HPV and/or CIN I)			O3	Atypical glandular cells of uncertain significance - site unknown
C3 Possible HGEA	S4	Possible high-grade squamous intraepithelial lesion (HSIL)	E3	Possible high-grade endocervical glandular lesion	O4	Possible endometrial adenocarcinoma
					O5	Possible high-grade lesion – non-cervical
C4 HGEA	S5	High-grade squamous intraepithelial lesion (HSIL) (CIN II/CIN III)	E4	Adenocarcinoma-in-situ		
	S6	High-grade squamous intraepithelial lesion (HSIL) with possible microinvasion/invasion	E5	Adenocarcinoma-in-situ with possible microinvasion/invasion		
C5 Malignant	S7	Squamous carcinoma	E6	Adenocarcinoma	O6	Malignant cells - uterine body
					O7	Malignant cells - vagina
					O8	Malignant cells – ovary
					O9	Malignant cells – other

Cytology Specimen Types

Type	Specimen
AØ	Not stated
A1	Conventional smear
A2	Liquid based specimen
A3	Conventional and liquid based specimen

Cytology Specimen Sites

Site	Specimen
BØ	Not stated
B1	Cervical
B2	Vaginal
B3	Other gynaecological site

Recommendation Codes

Code	Recommendation
RØ	No recommendation
R1	Repeat smear 3 years
R2	Repeat smear 2 years
R3	Repeat smear 12 months
R4	Repeat smear 6 months
R5	Repeat smear 6 – 12 weeks
R6	Colposcopy/biopsy recommended
R7	Already under gynaecological management
R8	Referral to specialist
R9	Other management recommended
RS	Symptomatic - clinical management required

Appendix B – Histology Codes

C Report Category[1]	S Squamous Cell	W Wart Virus (HPV Effect)	E Endocervical	M Endometrial	O Other
C0 Unsatisfactory[1].	S0 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 assesment 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]. S1 Native squamous epithelium; squamous metaplasia; immature squamous metaplasia with or without inflammatory or reactive changes; atrophy.	W- Not applicable (no squamous epithelium collected)[2]. W1 Absent.	E- Not applicable[2]. E1 Normal; inflammatory; reactive changes; endocervical polyp. E2 Mild nuclear changes (probably reactive).	M- Not applicable. M1 Normal; inflammatory; reactive; hormonal changes. M2 Endometrial hyperplasia.	O- Not applicable. O1 Normal vaginal tissues; inflammatory; reactive; hormonal changes.
C2 Low-grade intraepithelial abnormality.	S2 Atypia; atypical immature squamous metaplasia. S3 HPV effect. S4 Mild dysplasia (CIN I).	W2 Suggestive/possible. W3 Definite/consistent.		M3 Endometrial atypical hyperplasia (mild).	O2 HPV effect in vaginal tissues. O3 Vaginal intraepithelial dysplasia (VAIN I).
C3 High-grade intraepithelial abnormality.	S5 Moderate dysplasia (CIN II) S6 Severe dysplasia (CIN III).		E3 Endocervical dysplasia. E4 Adenocarcinoma-in-situ.	M4 Endometrial atypical hyperplasia (moderate to severe).	O4 Vaginal intraepithelial neoplasia (VAIN II - VAIN III).
C4 Invasive malignancy.	S7 Microinvasive squamous cell carcinoma. S8 Invasive squamous cell carcinoma.		E5 Microinvasive adenocarcinoma. E6 Invasive adenocarcinoma. E7 Adenosquamous carcinoma (cervix). E8 Carcinoma of cervix (other).	M5 Endometrial carcinoma (all types). M6 Endometrial stromal tumour. M7 Mixed mullerian tumour.	O5 Vaginal squamous cell carcinoma. O6 Vaginal edenocarcinoma. O7 Ovarian carcinoma (all types). 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
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

Notes:

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