Cervical screening in Australia 2004–2005

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Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AHMAC	Australian Health Ministers' Advisory Council
AIHW	Australian Institute of Health and Welfare
AMBS 2004	Australian Modified Bethesda System 2004
ARIA	Accessibility/Remoteness Index for Australia
ASGC	Australian Standard Geographical Classification (the classification designed by the ABS to define the geography of Australia)
AS rate	Age-standardised rate
AS rate (A)	Age-standardised rate using the Australian Standard Population
AS rate (W)	Age-standardised rate using the (WHO) World Standard Population
CD	(Census) Collection District
CI	Confidence interval
CIN	Cervical intraepithelial neoplasia
ERP	Estimated resident population
HGA	High-grade abnormality
HPV	Human papillomavirus
ICD	International Classification of Diseases
LGA	Low-grade abnormality
NHMRC	National Health and Medical Research Council
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RRMA	Rural, Remote and Metropolitan Areas (classification)
SA	South Australia
Tas	Tasmania
Vic	Victoria
WA	Western Australia
WHO	World Health Organization

Summary

The National Cervical Screening Program commenced in 1991. The major goals of the Program in Australia are to reduce the incidence and mortality of cervical cancer in women. Cervical screening through Pap smears detects abnormalities of the cervix at an early stage and medical intervention can avert the possible progression to cervical cancer.

This is the ninth annual report on the performance of the Program. Data were provided by state and territory cervical cytology registries and are presented on six indicators which measure program activity, performance and outcome. The key outcome data indicate that the Program has been very successful in meeting the goals of reducing incidence and mortality through early detection and treatment. In the period from 1982–1991 prior to commencement of the National Program, age-standardised incidence of cervical cancer was declining at an average of 0.7% per annum, and mortality was declining at 2.7% per annum. From 1991 to 2003 the average decline in incidence was 5.2% per annum and for mortality was 5.0% per annum (AIHW National Cancer Statistics Clearing House). Furthermore the incidence of cervical cancer among women in the target age range of 20–69 years declined from 17.2 per 100,000 women in 1991 to 9.1 in 2003, and mortality fell from 4.0 per 100,000 women in 1991 to 1.8 per 100,000 in 2004.

The main features in this report are as follows.

Participation

- In the two-year period 2004–2005 there were 3,462,907 women who participated in the National Cervical Screening Program. Women aged 20–69 years accounted for 98.4% of the women screened.
- Between the periods 2002–2003 and 2004–2005 the proportion of women aged 20–69 years participating in cervical screening increased from 60.7% to 61.0%.
- There was a steady decline in participation among women aged less than 40 years from 1998–1999 to 2004–2005 but continued improvement in participation for older women in the 55–69 year age group. For example, participation fell from 68.7% in 1998–1999 to 62.9% in 2004–2005 for women aged 30–34 years but increased from 46.5% to 49.7% during the same period for women aged 65–69 years.

Early re-screening

The recommended screening interval is two years following a normal (negative) smear.

- Of a cohort of women screened in February and March 2004 who had a normal Pap smear result, 25.3% had a repeat Pap smear within 21 months. It is not known what proportion of this early re-screening was justified on clinical grounds.
- There was a decline in the proportion of women being re-screened early from 32.0% in 1999 to 25.3% in 2004.

Detection of abnormalities

A low-grade abnormality includes atypia, warty atypia, possible cervical intraepithelial neoplasia (CIN), equivocal CIN, and CIN 1. A high-grade abnormality is defined to include CIN 1/2, CIN 2 and CIN 3 and adenocarcinoma in situ.

- In 2005 the screening program detected 31,111 histologically verified abnormalities of which 16,274 were low-grade and 14,837 were high-grade.
- The number of high-grade abnormalities detected per 1,000 women screened aged 20–69 years increased significantly between 1997 and 2005, from 6.4 to 7.5.
- With the exception of a rise in 2000, there has been a decline in the ratio of low-grade to high-grade abnormalities in women aged 20–69 years from 1.35 in 1999 to 1.10 in 2005.
- The number of high-grade abnormalities detected per 1,000 women screened was highest in the younger age groups. For women aged 20–24, the rate of high-grade abnormalities was 19.2 per 1,000 women screened; in contrast the rate was 1.0 per 1,000 women screened aged 65–69 years.

Incidence and mortality

- The number of new cases of cervical cancer has continued to decline. There were 725 new cases in Australia in 2003 compared with 1,091 in 1991 before the start of the organised screening program. The number of new cases of micro-invasive cervical cancers also fell from 166 to 85 over the same period.
- All histological types of cervical cancer have shown a statistically significant decrease in the age-standardised rates per 100,000 women aged 20–69 years with the exception of adenocarcinoma. The incidence of adenocarcinoma declined from 2.7 per 100,000 women in 1992 to 2.2 in 2003. It is possible that this is because these cells may be too deep in the endocervical canal to be easily detected with a Pap smear (Heley 2007).
- Cervical cancer was the 18th most common cause of cancer mortality in Australian women in 2004, accounting for 212 deaths in 2004 compared with 329 in 1991. Although there was some fluctuation from year to year, the age-standardised mortality rate from cervical cancer declined between 1991 and 2004. For all women there was a decline from 4.0 deaths per 100,000 women in 1991 to 1.9 in 2004; this represents a decline of almost 55%. During the same period, for women aged 20–69 years the rate fell from 4.0 to 1.9 per 100,000 women, a decline of 52.5%.
- Women aged 20–69 years from regional and remote locations experienced higher incidence and mortality rates for cervical cancer compared with women in major cities. In 2000–2003, age-standardised incidence was 8.9 per 100,000 females in major cities, 9.8 per 100,000 in regional areas and 12.3 per 100,000 in remote areas. Only the higher rate in remote areas was statistically significant. However, the age-standardised death rate in regional areas of 2.5 deaths per 100,000 females in 2001–2004 was significantly higher than the rate of 1.9 deaths per 100,000 in major cities. Because of small numbers, the death rate of 2.4 per 100,000 in remote areas was not significantly higher than the major cities rate.

Indigenous incidence and mortality

Data on Indigenous incidence rates are not available and only Queensland, Western Australia, South Australia and the Northern Territory have Indigenous mortality registration data of sufficient quality to be published.

- For these jurisdictions in the period 2001–2004, the age-standardised mortality rate for Indigenous women was 9.9 per 100,000 women, more than four times higher than the rate of 2.1 per 100,000 for non-Indigenous women in these states and the Northern Territory.

Summary trend comparison table for national data for all indicators for women in the target age group aged 20–69 years

	Current reporting period		Previous reporting period		Reporting commencement	
Indicator	**Year(s)**		**Year(s)**		**Year(s)**	
Participation in 24-month period	2004–2005	% 61.0	2002–2003	% 60.7	1996–1997	% 61.0
Early re-screening within 21 months of normal Pap smear[(a)]	2004	% 25.3	2003	% 26.2	1999[(a)]	% 32.0
Ratio of low- and high-grade abnormalities	2005	Ratio 1.10	2004	Ratio 1.15	1997	Ratio 1.47
High-grade abnormalities per 1,000 women screened (age-standardised rate)	2005	ASR 7.5	2004	ASR 7.4	1997	ASR 6.4
Incidence of cervical cancer per 100,000 women (age-standardised rate)	2003	ASR 9.1	2002	ASR 8.9	1997	ASR 11.4
Mortality from cervical cancer per 100,000 women (age-standardised rate)	2004	ASR 1.8	2003	ASR 2.2	1997	ASR 2.7

(a) From 1996 to 1998 the indicator reported on a 24-month period following a normal Pap smear; in 1999 the indicator was changed to a 21-month interval, hence 1999 is the earliest year for which data are available for comparison.

National cervical screening monitoring indicators

This report monitors the performance of the National Cervical Screening Program using indicators which measure program activity, performance and outcome. These indicators help measure changes in disease patterns and examine the contribution of cervical screening to preventing or reducing deaths from cancer of the cervix.

Performance indicators for the National Cervical Screening Program cover the areas of participation, early re-screening, low- and high-grade abnormality detection, incidence and mortality. These were developed and endorsed by the former National Advisory Committee and by state and territory cervical screening programs. A listing of the indicators and their definitions follows. The target age group for the National Cervical Screening Program is 20–69 years.

Indicator 1: Participation rate for cervical screening

The participation rate is the percentage of women screened in a 24-month period for women aged 20 years and over and for the target age group 20–69 years.

Indicator 2: Early re-screening

The proportion of women re-screened, by number of re-screens, during a 21-month period following a normal smear.

Indicator 3: Low-grade abnormality detection

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

Indicator 4: High-grade abnormality detection

Detection rate for histologically verified high-grade intraepithelial abnormalities per 1,000 women screened in a 12-month period for women aged 20 years and over and for the target age group 20–69 years.

Indicator 5.1: Incidence of micro-invasive squamous cell carcinoma

Incidence rate of micro-invasive squamous cell carcinoma per 100,000 estimated resident female population in a 12-month period for females of all ages and for the target age group 20–69 years.

Indicator 5.2: Incidence of squamous, adenocarcinoma, adenosquamous and other cervical cancer

Incidence rate of squamous, adenocarcinoma, adenosquamous and other cervical cancers (micro-invasive and invasive) per 100,000 estimated resident female population in a 12-month period for females of all ages and for the target age group 20–69 years.

Indicator 6.1: Mortality by age

Death rate from cervical cancer per 100,000 estimated resident female population in a 12-month period for females of all ages and for the target age group 20–69 years.

Periodic indicators

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

Periodic incidence and mortality indicators by location

Geographic region

In reports before 2000–2001, analysis of incidence and mortality data by geographic region used the Rural, Remote and Metropolitan Areas (RRMA) classification. This classification was developed in 1994 by the then Department of Primary Industries and Energy and the then Department of Human Services and Health (DPIE & DHSH 1994). It allows geographic regions to be classified into seven zones—two metropolitan, three rural and two remote zones.

This report uses the Australian Standard Geographical Classification (ASGC) which groups geographic areas into five classes. These classes are based on Census Collection Districts (CDs) and defined using the Accessibility/Remoteness Index for Australia (ARIA). ARIA is a measure of the remoteness of a location from the services provided by large towns or cities. A higher ARIA score denotes a more remote location. The five classes of the ASGC, along with a sixth 'Migratory' class, are listed in the following table.

The remoteness areas for the ASGC

Region	Collection districts within region
Major cities of Australia	CDs with an average ARIA index value of 0 to 0.2
Inner regional Australia	CDs with an average ARIA index value greater than 0.2 and less than or equal to 2.4
Outer regional Australia	CDs with an average ARIA index value greater than 2.4 and less than or equal to 5.92
Remote Australia	CDs with an average ARIA index value greater than 5.92 and less than or equal to 10.53
Very remote Australia	CDs with an average ARIA index value greater than 10.53
Migratory	Areas composed of off-shore, shipping and migratory CDs

Source: ABS 2001.

The ASGC is not directly comparable to the RRMA classification. Accessibility is judged purely on distance to one of the metropolitan centres. For example, the ASGC allocates Hobart to its second group (Inner regional Australia) and Darwin to its third group (Outer regional Australia), whereas the RRMA classification grouped them together with the other capital cities.

Indicator 5.3: Incidence by location

Incidence rate of cervical cancer per 100,000 estimated resident female population in a four-year period by location for females of all ages and for the target age group 20–69 years.

Indicator 6.2: Mortality by location

Death rate from cervical cancer per 100,000 estimated resident female population in a four-year period by location for females of all ages and for the target age group 20–69 years.

Indicator 6.3: Indigenous mortality

Death rate from cervical cancer per 100,000 estimated resident female population in a four-year period by Indigenous status for females of all ages and for the target age group 20–69 years.

This indicator examines the patterns of mortality among Indigenous women.

Identification of Indigenous status is still very fragmented and generally of poor quality in health data collection. Of the three collections used to report the cervical screening indicators, only the mortality database currently collects Indigenous status. Only Queensland, Western Australia, South Australia and the Northern Territory are currently considered to have adequate coverage of Indigenous deaths in the registration of deaths. Therefore, only mortality data from these jurisdictions are analysed in this report.

Confidence intervals

Where indicators include a comparison between states and territories, between time periods, between geographic locations or between Indigenous and other Australian women, a 95% confidence interval (CI) is presented along with the rates. This is because the observed value of a rate may vary owing to chance even where there is no variation in the underlying value of the rate. The 95% confidence interval represents a range (interval) over which variation in the observed rate is consistent with this chance variation. In other words, there is 95% confidence that the true value of the rate is somewhere within this range.

These confidence intervals can be used as a guide to whether changes in a particular rate are consistent with chance variation. Where the confidence intervals do not overlap, the difference between the rates is greater than that which could be explained by chance and is regarded as statistically significant.

For example, the participation rate for women aged 20–69 years in Victoria in 2004–2005 was 65.4% with a confidence interval of 65.3% to 65.5%. The corresponding rate for 2002–2003 was 64.2% with a confidence interval of 64.1% to 64.4%. These two intervals do not overlap, so the difference between the 2002–2003 and 2004–2005 rates is larger than we would expect due to chance alone.

Another example is the comparison between cervical mortality rates for women in the target group in remote areas. In the period 1997–2000 there were 4.6 cervical cancer deaths per 100,000 women living in remote areas. This rate had a confidence interval of 2.9 to 6.9. The 2001–2004 rate for women living in remote areas was 2.4 deaths per 100,000, with a confidence interval of 1.2 to 4.0. These confidence intervals overlap, so despite the relatively large difference between the two observed rates they are still consistent with chance variation. This arises from the fact that remote areas of Australia have small populations,

resulting in small numbers of deaths from any specific cause, and these rates may fluctuate a great deal from year to year over time. This in turn leads to relatively wide confidence intervals for an observed death rate.

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