Appendixes

Appendix A: Cervical cancer: symptoms, detection and treatment

Cervical cancer affects the cells lining the cervix, which is the lower part of the womb or uterus as it joins the inner end of the vagina. Like other cancers, cervical cancer is a disease where normal cells change, begin to multiply out of control, and form a growth or tumour. If not caught early enough, the tumour can invade local tissue and spread or metastasise to other parts of the body. The main symptoms of cervical cancer are unusual bleeding from the vagina, and sometimes an unusual vaginal discharge. However, these symptoms may not be due to cancer.

A cervical cancer may take 10 or more years to develop, but before this the cells may show pre-cancerous changes. These early changes can be detected by a Pap smear which is described in more detail below, and with early treatment there is an excellent chance of a full recovery. There are two levels of severity of these pre-cancerous lesions, low-grade abnormalities and high-grade abnormalities, with the higher grade lesions more likely to progress to a cancer. These are usually graded from warty atypia (HPV effect), atypia, equivocal CIN, possible CIN, endocervical dysplasia NOS, CIN1 to CIN3, and carcinoma *in situ*.

The Pap smear is the most common way to detect pre-cancerous changes, which rarely cause any symptoms. The test involves a doctor inserting a speculum into the vagina and gently scraping the surface of the cervix. This process collects cells that are transferred onto a slide or into a special liquid, which is then sent to a pathology laboratory for assessment. Pap smears are offered by general practitioners, gynaecologists, family planning clinics, hospital outpatient clinics and in some circumstances nurse practitioners.

If a pre-cancerous change is suggested by the Pap smear a doctor is able to look directly at the cervix by inserting an instrument called a colposcope into the vagina. Using a special stain the doctor can highlight any suspicious area, pre-cancerous or cancerous. The doctor will then take a tissue sample (a biopsy) of the suspicious area for further examination by the pathologist.

Pre-cancerous changes are relatively easily treated and are cured in nearly all cases. The type of treatment depends on whether the change observed is low or high grade, the woman's age and general health, whether she wants to have children, and her preferences.

There is a range of treatments for pre-cancerous changes, including cryosurgery (freezing), cauterisation (burning, also called diathermy), laser surgery, or loop or cone biopsies. In a small number of instances a hysterectomy may be necessary, especially if changed cells are found inside the opening of the uterus and the woman does not want to have children in the future.

For invasive cancer, a cone biopsy or hysterectomy is generally performed. If the cancer cells are only detected on the surface of the cervix, it may be treated by a cone biopsy. If it has invaded deeper into the cervix a hysterectomy is generally performed. In advanced cases, a radical hysterectomy is needed to remove the cervix and uterus along with a margin of tissue around the cervix and lymph nodes from the pelvis. Radiotherapy is sometimes used as well as surgery, and for more advanced cases it may be used on its own.

Appendix B: Data sources and limitations

All data used in this report are based on calendar years. Data are derived from multiple sources and are summarised below.

Table B1: Cervical cancer screening indicators data sources

Indicator	Description	Data source
1	Participation rate for cervical cancer screening	National Cervical Screening Program
2	Early rescreening	National Cervical Screening Program
3	Low-grade abnormality detection	National Cervical Screening Program
4	High-grade abnormality detection	National Cervical Screening Program
5	Incidence of micro-invasive cervical cancer (ICD 180)	National Cancer Statistics Clearing House
6	Incidence of squamous, adenocarcinoma, adeno-squamous and other cervical cancer (ICD 180)	National Cancer Statistics Clearing House
7	Mortality from cervical cancer (ICD 180)	AIHW Mortality Database

Population data

The Australian Bureau of Statistics estimated resident female population has been used to calculate incidence and mortality rates. Participation rates were calculated using the average of the 1996 and 1997 estimated resident female population (see Appendix D for tables). There may be some variation in published participation rates because national rates use estimated resident population data in the denominator whereas local data analysis may use census counts. The denominator population used to calculate cervical screening participation rates has been adjusted by the estimated proportion of women who have had a hysterectomy by age. These data were derived from the 1995 National Health Survey, and are tabled in Appendix D.

The age-standardised rates in this publication are calculated using the total estimated 1991 mid-year Australian resident population. Where appropriate, rates are also standardised to the World Standard Population for international comparison. Both the Australian and World Standard Populations are in Appendix D.

Cervical screening

Indicators 1–4 do not include data from Queensland because the cervical screening register in Queensland was not operational at the time of data processing. The incidence and mortality data used in Indicators 5 to 9 include Queensland.

The New South Wales Pap Test register began operations in July 1996 leaving it almost 7 months short of data compared with the other States and Territories. New South Wales advised us that the best way of overcoming this problem was to use a conversion factor of 1.27, which is based on their modelling of screening data and extrapolating back. The Northern Territory Pap smear register began operations in March 1996, and participation rates have been estimated for the period January to March 1996 using a factor of 1.08.

Due to the difficulties of Indigenous identification, mortality data used in Indicator 10 are based on deaths in Western Australia, South Australia and the Northern Territory only.

Other data limitations:

- All States and Territories were able to provide data for the target age group 20–69 years; however, not all programs were able to supply data for women beyond this age group.
- Hysterectomy fractions are calculated using national data derived from the National Health Survey using aggregate data that does not necessarily reflect variation at the State or Territory level.
- Participation rates will be underestimates to the extent that a small percentage of women choose to opt-off local registers.
- Participation rates published by State and Territory programs may differ from those in this publication because of variation in denominators used.

Appendix C: Methods

This section describes the methods employed to calculate the estimates presented in the tables in the body of this publication.

Age-specific rates

Age-specific rates are calculated by dividing the number of cases occurring in each specified age group by the corresponding population in the same age group expressed as a rate per l00,000 population. This rate may be calculated for particular age and sex groupings, e.g.

$$\text{Age-specific cervical cancer incidence rates in females aged 50–54} = \frac{\text{New cases 1995 aged 50–54 years}}{\text{1995 female population aged 50–54 years}} \times 100{,}000$$

$$= \frac{12}{475{,}987} \times 100{,}000$$

$$= 260.5 \text{ per } 100{,}000$$

Age-standardised rates (AS Rate)

Rates are adjusted for age to facilitate comparisons between populations that have different age structures, e.g. between youthful and ageing communities. There are two different methods commonly used to adjust for age. In this publication we use direct standardisation in which age-specific rates are multiplied against a constant population (the Australian 1991 Population Standard unless otherwise specified). This effectively removes the influence of age structure on the summary rate that is described as the age-standardised rate. The method may be used for both incidence and mortality calculations. The method used for this calculation comprises three steps.

1. Calculate the age-specific rate (as shown above) for each age group.
2. Calculate the expected number of cases in each 5-year age group by multiplying the age-specific rates by the corresponding standard population and dividing by 100,000, giving you the expected number of cases.
3. Sum the expected number of cases in each age group to give the age-standardised rate. Divide this sum by the total of the standard population and multiply by 100,000.

$$\text{CI approximation} = \text{AS Rate} \pm 1.96 \times \frac{\text{AS Rate}}{\sqrt{\text{Number of cases}}}$$

Appendix D: Population data

Table D1: Australian Standard Population[1] and World Standard Population[2]

Age group	World Standard Population (W)	Australian 1991 Population Standard (A)
0–4	12,000	1,271,703
5–9	10,000	1,272,208
10–14	9,000	1,241,619
15–19	9,000	1,364,074
20–24	8,000	1,396,764
25–29	8,000	1,399,663
30–34	6,000	1,425,735
35–39	6,000	1,328,387
40–44	6,000	1,294,271
45–49	6,000	1,029,145
50–54	5,000	846,934
55–59	4,000	725,950
60–64	4,000	736,868
65–69	3,000	671,390
70–74	2,000	510,755
75–79	1,000	384,495
80–84	500	229,828
85+	500	154,247
Total	100,000	17,284,036

Source: (1) Australian Bureau of Statistics (1993); (2) Doll and Smith (1982).

Table D2: Hysterectomy fractions for women aged 15–80+ years, Australia, 1995

Age group	% of women who have not had a hysterectomy
18–19	98.4
20–24	99.8
25–29	99.3
30–34	98.0
35–39	91.9
40–44	85.2
45–49	79.1
50–54	68.5
55–59	68.5
60–64	67.8
65–69	68.8
70–74	66.8
75–79	66.8
80+	61.5
Total	84.3

Source: Australian Bureau of Statistics 1995.

Table D3: Estimated resident female populations, by State and Territory, June 1997

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
0–4	213,602	153,004	117,741	61,641	47,117	16,167	10,805	8,754	628,975
5–9	215,452	155,910	120,659	64,705	48,050	17,118	10,981	8,052	641,103
10–14	212,957	153,621	122,265	65,724	49,787	17,717	11,007	7,267	640,506
15–19	208,613	154,677	120,201	63,526	48,055	16,633	12,200	6,573	630,537
20–24	222,995	168,887	128,552	66,530	50,239	15,359	14,108	8,402	675,157
25–29	243,236	185,747	133,382	70,032	53,699	16,493	13,501	9,460	725,686
30–34	241,527	180,658	129,315	69,898	54,861	17,239	12,652	8,419	714,742
35–39	250,552	183,985	135,043	73,076	58,587	19,143	13,021	7,723	741,273
40–44	231,972	172,446	125,622	69,750	55,418	17,846	12,457	6,796	692,443
45–49	213,725	159,502	117,362	62,781	52,430	16,375	12,263	5,713	640,228
50–54	182,009	133,847	98,769	49,912	44,573	13,841	9,382	4,135	536,531
55–59	144,389	106,269	75,098	39,083	34,991	11,294	6,170	2,497	419,831
60–64	127,041	93,703	62,228	32,483	31,324	9,820	4,551	1,611	362,779
65–69	125,247	90,505	59,640	30,029	31,355	9,473	3,923	1,111	351,299
70–74	117,239	85,779	54,277	26,452	31,035	8,838	3,599	774	327,997
75–79	91,554	65,723	43,003	20,398	24,558	7,169	2,596	494	255,497
80–84	63,698	46,473	29,632	14,781	17,125	5,130	1,682	297	178,825
85+	53,221	40,121	24,362	12,919	14,683	4,041	1,235	238	150,822
Total	3,159,029	2,330,857	1,697,151	893,720	747,887	239,696	156,133	88,316	9,314,231

Source: Australian Bureau of Statistics 1997.

Table D4: Estimated resident female populations, by State and Territory, June 1998

Age group	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
0–4	211,964	151,230	118,238	61,590	46,451	15,566	10,462	8,599	624,234
5–9	216,598	156,623	122,769	64,891	48,262	16,882	10,785	8,227	645,215
10–14	212,926	154,468	121,554	66,277	49,492	17,415	10,863	7,568	640,736
15–19	211,691	156,110	122,923	64,859	48,307	16,804	11,724	6,801	639,297
20–24	219,602	167,409	126,100	67,118	49,190	15,037	13,223	7,940	665,691
25–29	246,280	186,409	136,225	71,206	53,605	16,466	13,292	9,531	733,145
30–34	237,843	180,162	128,250	69,463	53,750	16,601	12,265	8,436	706,925
35–39	253,091	185,703	137,485	73,996	58,855	18,924	12,781	7,923	748,913
40–44	235,756	174,788	128,226	70,927	55,553	17,901	12,324	7,007	702,629
45–49	216,581	161,284	119,578	64,508	53,063	16,475	12,174	5,783	649,539
50–54	192,250	142,523	105,601	53,595	47,242	14,574	9,998	4,445	570,287
55–59	147,772	108,537	78,235	40,092	35,929	11,424	6,505	2,646	431,183
60–64	129,092	95,392	63,813	33,488	31,816	9,980	4,771	1,754	370,123
65–69	123,457	90,160	59,496	30,121	30,876	9,500	3,946	1,136	348,707
70–74	117,664	86,057	55,247	26,908	30,802	8,806	3,614	806	329,909
75–79	95,504	69,353	44,979	21,587	25,717	7,403	2,866	513	267,923
80–84	64,393	46,276	30,230	14,665	17,197	5,165	1,752	316	180,000
85+	54,706	41,424	25,580	13,305	15,255	4,173	1,310	249	156,006
Total	3,187,170	2,353,908	1,724,529	908,596	751,362	239,096	154,655	89,680	9,410,462

Source: Australian Bureau of Statistics 1998