Australian Government
Australian Institute of Health and Welfare

Cervical screening in Australia

2019

AIHW

Australian Government
Australian Institute of Health and Welfare

Cancer Series
Number 123

Cervical screening in Australia 2019

Australian Institute of Health and Welfare
Canberra
Cat. no. CAN 124

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This publication is part of the Australian Institute of Health and Welfare's cancer series. A complete list of the Institute's publications is available from the Institute's website www.aihw.gov.au.

ISSN 2205-4855 (PDF)
ISSN 1039-3307 (Print)
ISBN 978-1-76054-525-3 (PDF)
ISBN 978-1-76054-526-0 (Print)

Suggested citation

Australian Institute of Health and Welfare 2019. Cervical screening in Australia 2019. Cancer series no. 123. Cat. no. CAN 124. Canberra: AIHW.

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Published by the Australian Institute of Health and Welfare

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Contents

Summary

The National Cervical Screening Program (NCSP) aims to reduce cervical cancer cases, illness and death in Australia. *Cervical screening in Australia 2019* is the last monitoring report for the previous NCSP, presenting key data for women screened using Pap tests between January 2016 and June 2017 (prior to the renewed NCSP from 1 December 2017).

The following data are for women aged 20–69, screened under the previous NCSP.

Cervical cancer cases and deaths were low by international standards

In 2015, 727 women aged 20–69 were diagnosed with cervical cancer, and 140 died from the disease in 2017. This is equivalent to 9 new cases of cervical cancer diagnosed, and 2 deaths, per 100,000 women. These rates are similar to those for previous years.

Both incidence and mortality halved between the introduction of the NCSP in 1991 and the year 2002 and have since remained at 9–10 new cases, and 2 deaths, per 100,000 women.

More than 5 in 10 women participated in cervical screening

Between 1 January 2016 and 30 June 2017, 2,973,370 women participated in cervical screening. This was estimated to be around 54%–56% of women aged 20–69. (This estimate does not include the final 4 months of the previous NCSP and should not be extrapolated for the period 1 January 2016 to 30 November 2017.)

Participation varied across remoteness areas—it was highest in *Inner regional* areas at 57% and lowest in *Very remote* areas at 46%. There was a clear association between participation and socioeconomic group—at 50% for women living in the lowest socioeconomic areas and 62% for women living in the highest socioeconomic areas.

Relatively few women rescreened early, and a third responded to a reminder

Only 10% of women with a negative screen (that is, no abnormalities were detected) in 2015 rescreened earlier than the recommended 2 years, continuing a favourable downward trend. Of the more than 1 million women sent a 27-month reminder letter by a cervical screening register in 2016, 31% rescreened within 3 months, similar to the figure for previous years.

High-grade abnormality detection rate continued to decline in young women

Between January 2017 and June 2017, for every 1,000 women screened, 7 had a high-grade abnormality detected by histology, providing an opportunity for treatment before possible progression to cancer.

The rate of detection of high-grade abnormalities for women aged under 30 has declined. This effect is most likely a result of girls who were vaccinated against human papillomavirus (HPV) under the National HPV Vaccination Program moving into the screening cohort, leading to declines in the occurrence (and hence detection) of high-grade abnormalities.

Indigenous women had lower screening rates and poorer outcomes

Incidence of cervical cancer in Aboriginal and Torres Strait Islander women is more than 2 times that of non-Indigenous women, and mortality more than 3 times the non-Indigenous rate. National cervical screening rates for Indigenous women are not available, as Indigenous status information is not collected on pathology forms in all jurisdictions, however there is evidence from a range of sources that Indigenous women are under-screened.

Report card

Measure	What indicates a good finding?	Previous data	Latest data	Recent trend
Participation in 2016–2017[(a)]	Higher is better	56.0%	54.4–56.4%[(b)]	Steady at 56% or falling to 54%
Rescreening after reminder letter	Higher is better	31.6%	31.4%	Falling from 33% to 31%
Pap tests not of satisfactory quality[(c)]	Lower is better	2.5%	2.5%	Steady at 2.5%
Pap tests negative for abnormalities[(c)]	. .	92.1%	91.9%	Steady at 92%
Pap tests with no endocervical component[(c)]	<20% is better	23.8%	26.1%	Rising from 22% to 26%
High-grade abnormality detection in 2017[(c)]	. .	7.4	7.1	Falling from 8 to 7
Incidence in 2015	Lower is better	10.2	9.6	Steady at 9 to 10
Mortality in 2017	Lower is better	2.1	1.7	Steady at around 2

. . = not applicable

(a) Data are for 1 January 2016 to 30 June 2017 only, and may not be comparable with previous data that were for 24 months.

(b) Crude rates.

(c) Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Note: This report card uses age-standardised rates, where available, to aid in comparing trends. All data shown are for women aged 20–69. ‘Recent trend’ refers to the past 3–5 years. Figures for ‘High-grade abnormality detection’ are the number of women with a high-grade abnormality per 1,000 women screened. Figures for ‘Incidence’ are the number of new cases per 100,000 women. Figures for ‘Mortality’ are the number of deaths per 100,000 women.

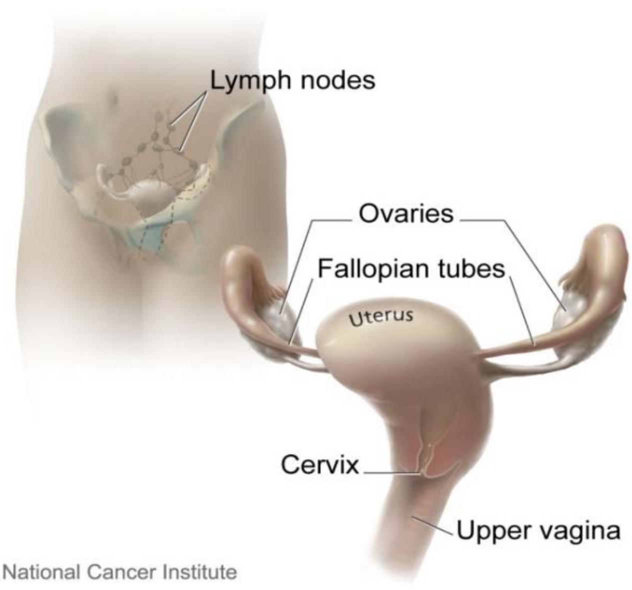
1 Introduction

1.1 Cervical cancer

Cancer is a group of several hundred diseases in which abnormal cells are not destroyed naturally by the body, but instead multiply and spread out of control. Cancers are distinguished from each other by the specific type of cell involved and by the place in the body in which the disease began.

Cervical cancer affects the cells of the uterine cervix, which is the lower part (or 'neck') of the uterus where it joins the upper end of the vagina (Figure 1.1). Cervical cancer develops when abnormal cells in the lining of the cervix begin to multiply out of control and form precancerous lesions. If undetected, these lesions can develop into tumours and spread into the surrounding tissue.

Figure 1.1: Anatomy of the cervix and nearby organs



Source: http://visualsonline.cancer.gov.

Worldwide, cervical cancer is the fourth most common cancer affecting women and the seventh most common cancer overall; however, the burden of cervical cancer is not equal globally. Around 85% of the global burden occurs in the less-developed regions, where cervical cancer accounts for almost 12% of all female cancers (IARC 2014). In contrast, in Australia, cervical cancer accounts for less than 2% of all female cancers, with a relatively low incidence of 7 new cases per 100,000 women of all ages (AIHW 2018a).

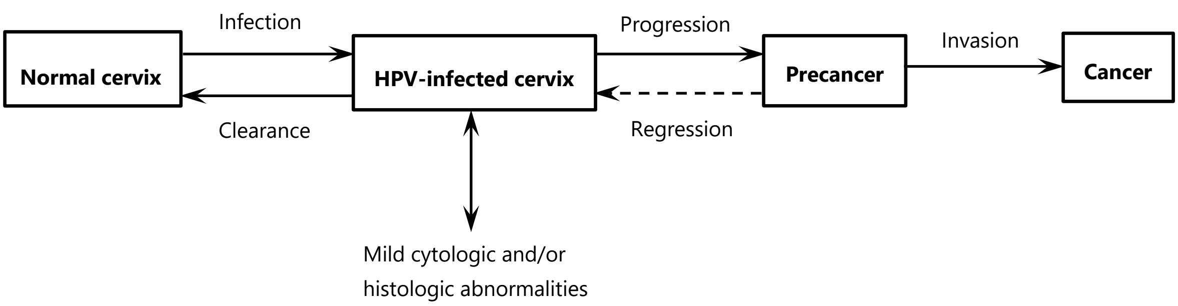
1.2 The primary cause of cervical cancer is HPV

Infection with one or more of the 40 genital human papillomavirus (HPV) types is extremely common, with infection rates of this sexually transmitted infection peaking in women in young adulthood (the period following sexual debut). Most HPV infection is asymptomatic and cleared by the immune system within a year. However, in up to 10% of women, the infection can persist, and in a very small number of women, persistent infection with oncogenic (cancer-causing) HPV (of which there are currently 15 types recognised) may eventually lead to cervical cancer. Two of these oncogenic HPV types, 16 and 18, have been detected in 70%–80% of cases of cervical cancer in Australia (Brotherton 2008).

That cervical cancer is a rare outcome of persistent infection with oncogenic HPV was determined nearly two decades ago (Bosch et al. 2002; Walboomers et al. 1999). More recently, using Australian data, Brotherton, Tabrizi and others (2017) detected HPV in 92.9% of 847 cervical cancers tested (77.1% of the HPV-positive cancers contained HPV 16 or 18, 15.9% contained HPV 31/33/45/52 or 58, and 7.0% another type).

The four major steps in cervical cancer development are infection with HPV (from sexual activity), viral persistence (as most HPV infections clear with no treatment), progression to precancerous abnormalities (many of which will also regress with no treatment), and invasive cervical cancer (Schiffman et al. 2007; Schiffman & Kjaer 2003) (Figure 1.2).

Figure 1.2: Role of HPV infection in the development of cervical cancer



Note: The development of cervical cancer is not unidirectional—most HPV-infected cells return to normal and a large proportion of precancerous abnormalities do not progress to cervical cancer, even in the absence of treatment.

Source: Reproduced with permission from M Schiffman, National Cancer Institute (Schiffman & Kjaer 2003).

However, while the cell changes caused by persistent infection with oncogenic HPV are necessary for precancerous changes to the cervix to develop, a range of other factors will influence whether precancerous changes will progress to cervical cancer; these include smoking, multiparity (specifically, more than 5 full-term pregnancies), a young age at first full-term pregnancy, oral contraceptive use, and immunosuppression (Cancer Council Australia 2014).

1.3 Cervical cancer is largely preventable

The major role that HPV plays in the development of cervical cancer allows for both primary and secondary strategies for the prevention of cervical cancer to be implemented in those countries with available resources to make its prevention a priority.

In Australia, primary prevention of cervical cancer is through vaccination against HPV through the National HPV Vaccination Program, to prevent women being infected with oncogenic HPV types that cause the majority of cervical cancer. Secondary prevention of cervical cancer is through cervical screening, through the National Cervical Screening Program (NCSP), to detect and treat abnormalities while they are in the precancerous stage, before possible progression to cervical cancer. This is possible because cervical cancer is one of the few cancers that has a precancerous stage that lasts for many years prior to the development of invasive disease, which provides an opportunity for detection and treatment (WHO 2014).

The strength of cervical screening comes from repeating the screening test at agreed rescreening intervals, which allows more accurate detection of precancerous abnormalities over the long preinvasive stage of squamous cervical cancers. Recognition of cervical screening as a program of rescreening at regular intervals, rather than as a single opportunistic test, was important in the establishment of the NCSP (Dickinson 2002).

A recent data linkage study demonstrated the benefits of cervical screening in preventing cervical cancer, finding that just over 90% of cervical cancers occurred in women who had either never screened or who were lapsed screeners (AIHW 2018b).

Until 1 December 2017, detection of precancerous abnormalities through cervical screening used cytology from the Papanicolaou smear, or ‘Pap test’, as the screening tool, with cells collected from the transformation zone of the cervix—the area of the cervix where the squamous cells from the outer opening of the cervix and glandular cells from the endocervical canal meet (where most cervical abnormalities and cancers are detected). The aim of the screening Pap test was to identify those women who may have a cervical abnormality (as indicated by the presence of abnormal cells in the specimen collected) and therefore require further diagnostic testing.

Detecting precancerous changes to cells allows for intervention before cervical cancer develops; however, it is important to recognise that some cervical cancers do not have a precancerous stage, and therefore cannot be detected by cervical screening. These tend to be rare but aggressive cancers, such as neuroendocrine cancer of the cervix. The two most aggressive types are small cell neuroendocrine carcinoma and large cell neuroendocrine carcinoma, neither of which appears to have a preinvasive stage (Necervix.com 2014).

Box 1.1: Key messages

Cervical cancer is a rare outcome of persistent infection with oncogenic HPV

Infection with one or more oncogenic HPV types is the underlying cause of almost all cases of cervical cancer.

Infection with HPV is very common, and most infections will resolve spontaneously. It is only in a very small number of women that infection with oncogenic HPV persists, which may lead to precancerous abnormalities and, if not detected by cervical screening and treated, may progress to cervical cancer.

Cervical cancer is a largely preventable disease

In Australia, primary prevention of cervical cancer is through vaccination against HPV, through the National HPV Vaccination Program, to prevent women being infected with oncogenic HPV types that cause the majority of cervical cancer. Secondary prevention of cervical cancer is through cervical screening, through the NCSP, to detect and treat abnormalities while they are in the precancerous stage, before any possible progression to cervical cancer.

Cervical screening is possible because cervical cancer is one of the few cancers that has a precancerous stage that lasts for many years prior to the development of invasive disease, which provides an opportunity for detection and treatment. Note, however, that some rare (and often aggressive) cervical cancers do not have a precancerous stage, and therefore cannot be detected by cervical screening.

2 Moving towards a renewed National Cervical Screening Program

2.1 Cervical screening from 1991 to 2017

In 1991, the Australian Health Ministers' Advisory Council (AHMAC) accepted recommendations made by the Screening Evaluation Steering Committee in the Australian Institute of Health report *Cervical cancer screening in Australia: options for change* (AIHW 1991) that saw the establishment of the 'Organised Approach to Preventing Cancer of the Cervix', Australia's cervical screening program. Soon afterwards, this became known as the National Cervical Screening Program, operating as a joint program of the Australian Government and state and territory governments, and recommending 2-yearly Pap tests.

The initial aim of an organised approach to screening was to further reduce the incidence and mortality of cervical cancer beyond the reductions attributable to the opportunistic cervical screening available in Australia since the mid-1960s (Dickinson 2002).

This aim was realised soon after the program's introduction, with an estimated 70% of squamous cell carcinomas of the cervix (around 1,200 cases) prevented in 1998 as a result (Mitchell 2003), a finding also supported by more recent analyses of incidence and mortality trends (Canfell et al. 2006; Luke et al. 2007). Indeed, the relatively low incidence and mortality of cervical cancer in Australia, compared with other countries (Ferlay et al. 2010), has been largely attributed to Australia's national cervical screening program and its successful implementation in 1991 (NHMRC 2005).

However, over the past two decades many developments have altered the environment in which the NCSP operates, making it very different from what existed in 1991. The main influence has been a greater understanding of the natural history of cervical cancer and the role HPV infection plays in this disease, as this has led to an international examination of the optimal screening age range and interval, the development of methods to test for the presence of HPV, and, subsequently, a vaccine against HPV.

In April 2007, Australia introduced the National HPV Vaccination Program, which included an ongoing program for girls aged 12–13 and a 'catch-up' program for females aged 14–26. This program was extended to males from February 2013.

By protecting vaccinated women from infection with the oncogenic HPV types that cause the majority of cervical cancer, the National HPV Vaccination Program is expected to reduce the number of cervical abnormalities and, eventually, the incidence of cervical cancer. It was recognised that this program would affect both the effectiveness and cost-effectiveness of the NCSP, and it was subsequently acknowledged that the NCSP, as it currently existed, would need to change to adapt to this different environment while continuing to operate according to current evidence and best practice.

In light of this, in 2011 the former Australian Population Health Development Principal Committee of AHMAC endorsed a plan to renew the NCSP. This commenced in 2011, undertaken by the Standing Committee on Screening and supported by the Department of Health. It aimed to ensure that all Australian women, HPV-vaccinated and unvaccinated, had access to a cervical screening program that was safe, acceptable, effective, efficient and based on current evidence (MSAC 2014).

On 28 April 2014, the Medical Services Advisory Committee (MSAC) announced its recommendations for a renewed NCSP. These recommendations included 5-yearly cervical screening of HPV-vaccinated and unvaccinated women aged 25–69, using a primary HPV test with partial HPV genotyping and reflex liquid-based cytology (LBC) triage, followed by exit testing of women aged 70–74 (MSAC 2014). These recommendations were accepted, and the current NCSP commenced on 1 December 2017.

2.2 Cervical screening from 1 December 2017

While the current, renewed NCSP shares the aims of the previous NCSP, there are substantial changes, supported by new policy and new clinical management guidelines (Cancer Council Australia Cervical Cancer Screening Guidelines Working Party 2016). These changes, which came into effect on 1 December 2017, are detailed in Box 2.1.

Box 2.1: Changes to the National Cervical Screening Program

From 1 December 2017:

- a 5-yearly Cervical Screening Test replaced the 2-yearly Pap test
- women who were already having Pap tests should have their first Cervical Screening Test when they are next due for a Pap test (for women with a normal screening history this is usually 2 years after their most recent Pap test)
- women who have ever been sexually active should have a Cervical Screening Test every 5 years
- women will be invited to start cervical screening from the age of 25 and continue screening until they are 74
- women who have been vaccinated against human papillomavirus (HPV) need regular cervical screening as the vaccine protects against some but not all oncogenic types of HPV.

Health-care providers will still perform a vaginal speculum examination and take a cervical sample, but the sample medium is liquid-based for partial HPV genotyping.

Source: www.cancerscreening.gov.au.

2.3 Monitoring from 1 December 2017

To support monitoring of the current, renewed NCSP, new performance indicators have been developed; these are detailed in the *National Cervical Screening Program data dictionary* (AIHW 2017a). Data for women screened from 1 December 2017 onwards will be reported against the new performance indicators for the current NCSP in future monitoring reports.

This report, however, is the final monitoring report of the previous NCSP that used Pap tests as the screening tool, presenting data for women screened between 1 January 2016 and 30 June 2017, and as such uses the target age group 20–69 and performance indicators for the previous NCSP.

3 Key qualities of the National Cervical Screening Program

3.1 Screening behaviour

Cervical screening in Australia is not provided by a dedicated service but is part of primary health care. Therefore, all women who choose to have a cervical screening test through any health-care provider are considered to be part of the NCSP. Being part of the NCSP means there are standards for laboratories that interpret cervical screening test results; evidence-driven guidelines to aid in the management of women after they receive cervical screening test results; and, under the previous NCSP, dedicated cervical screening registers that acted as a ‘safety net’ for participating women, as well as encouraging regular cervical screening tests.

One indicator of the performance of the NCSP is the proportion of women in the population who participate in cervical screening, measured as the percentage of women in the target age group who had at least one cervical screening test in the recommended screening interval. High participation in screening is required for the NCSP to achieve its aim of reducing cervical cancer incidence, morbidity and mortality, by detecting and treating cervical abnormalities that could otherwise develop into cervical cancer.

Participation under the previous NCSP was defined as the proportion of women in the population aged 20–69 who had at least one Pap test in a 2-year period. However, data for this last reporting period end at 30 June 2017, prior to the commencement of the current NCSP on 1 December 2017, due to the transition of data from the previous NCSP to the current NCSP. Therefore, in this report, participation is estimated as the proportion of women who had at least one Pap test in the 18-month period 1 January 2016 to 30 June 2017.

Screening behaviour results

Estimating participation between 1 January 2016 and 30 June 2017

Between 1 January 2016 and 30 June 2017, 2,973,370 women aged 20–69 participated in cervical screening. The estimated population for women aged 20–69 over this 18-month period was calculated by multiplying the average of the 2016 and 2017 populations by 0.75 to allow a participation rate to be estimated. Using this crude method resulted in an estimated participation rate for the period 1 January 2016 to 30 June 2017 of 56.3%.

Using a different method to calculate the population by averaging the 2016 population and 0.5 of the 2017 population resulted in a similar participation rate of 56.4%.

To determine if 18 months of data represent 75% of 24 months of data, the three 24-month periods before the year 2016 were examined. The number of women screened between 1 January of one year and 30 June of the following year comprised 0.750, 0.756 and 0.754—averaged to 0.753 (as participation in cervical screening tends to be slightly higher between January and June than between July and December) (unpublished data, not shown). Although it is not possible to know if the 18 months of data reported here follow the same pattern, the estimated participation rate has been corrected for this effect by multiplying the average of the 2016 and 2017 populations by 0.753, which resulted in a slightly lower estimated participation rate of 56.1%.

An alternative method was also applied, whereby data supplied were extrapolated forward from the number of women screened at 18 months to what the number would be at 24 months if patterns of screening continued as they had for the 18 months of real data. The benefit of this method is that the population does not need to be altered. This method results in an estimated participation rate of 54.4%.

In the interest of having a single estimate of participation, due to the many unknowns, the rate of 56.3% derived using the simplest estimated method is preferred, and is the method used in this report for estimates by age and state and territory. In doing so, however, it is acknowledged that the true rate probably lies somewhere between 54.4% and 56.4%. Historical participation rates from 1996–1997 to 2016–June 2017 are shown in Table 3.1.

Table 3.1: Number and age-standardised rate of women aged 20–69 participating in cervical screening, 1996–1997 to 2016–June 2017

Reporting period	Participants[(a)]	Adjusted population[(b)]	Crude rate[(c)]	AS rate[(d)]
1996–1997[(e)]	2,563,107	4,171,326	61.4	61.2
1997–1998[(e)]	2,653,504	4,210,148	63.0	62.8
1998–1999[(e)]	2,716,364	4,246,280	64.0	63.7
1999–2000	3,244,329	5,245,032	61.9	61.7
2000–2001	3,262,931	5,302,865	61.5	61.4
2001–2002	3,296,409	5,365,549	61.4	61.4
2002–2003	3,318,354	5,432,781	61.1	61.1
2003–2004	3,354,519	5,501,337	61.0	61.1
2004–2005	3,407,219	5,738,149	59.4	59.4
2005–2006	3,452,093	5,822,719	59.3	59.3
2006–2007	3,549,524	5,920,032	60.0	60.1
2007–2008	3,599,919	6,035,760	59.6	59.8
2008–2009	3,638,941	6,167,170	59.0	59.3
2009–2010	3,635,929	6,291,062	57.8	58.2
2010–2011	3,641,198	6,396,134	56.9	57.3
2011–2012	3,723,738	6,506,119	57.2	57.7
2012–2013	3,815,705	6,626,238	57.6	58.1
2013–2014	3,853,170	6,739,873	57.2	57.7
2014–2015	3,839,611	6,845,482	56.1	56.6
2015–2016	3,850,427	6,947,504	55.4	56.0
2016–June 2017	2,973,370	. .	54.4–56.4[(f)]	. .

(a) 'Participants' is the number of women aged 20–69 screened in each 2-year reporting period. 'Number of women screened' includes all women screened in each jurisdiction, not just those women resident in each jurisdiction—except for Victoria and the Australian Capital Territory, for which only residents of the jurisdiction (and immediate border residents) are included.

(b) 'Adjusted population' is the average of the Australian Bureau of Statistics' (ABS's) estimated resident population for women aged 20–69 for the 2 years, adjusted to include only women with an intact cervix using age-specific hysterectomy fractions. Reporting periods 1996–1997 to 2003–2004 used hysterectomy fractions derived from the 2001 ABS National Health Survey, while reporting periods 2004–2005 to 2016–June 2017 used hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database and are therefore not comparable.

(c) 'Crude rate' is the number of women aged 20–69 screened in each 2-year reporting period, as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix—as described in footnote (b).

(d) 'Age-standardised (AS) rate' is the number of women aged 20–69 screened in each 2-year reporting period, as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix—as described in footnote (b), age-standardised to the Australian population as at 30 June 2001.

(e) As the Queensland Health Pap Smear Register began operations in February 1999, Queensland data are excluded from both participant data and population data for the 1996–1997, 1997–1998 and 1998–1999 reporting periods.

(f) Estimated range is based on 4 methods and is not comparable with that for previous years.

Source: AIHW analysis of state and territory cervical screening register data.

Adding to the uncertainty around participation in 2016–2017 is that cervical screening participation between July and November 2017 (data for which are not included in this report) may not have been typical of these months in previous years, as it is conceivable that the screening behaviour of many women may have changed in the lead-up to the introduction of 5-yearly HPV tests from 1 December 2017. This means that extrapolation of these data to the months July to November 2017 is inadvisable.

The following participation data for 3- and 5-year participation and for participation across remoteness areas and socioeconomic groups appear as previously reported in *Cervical screening in Australia 2018*, as these data are considered more robust than estimates.

Participation in the NCSP over 3-year and 5-year periods provides further information about screening behaviour outside the recommended 2 years. Data show that participation over the 3 years 2014–2016 was 68.6%, and participation over the 5 years 2012–2016 was 81.9%. This indicates that women participated in screening, but a considerable number were doing so less often than recommended by the previous NCSP.

Three-year participation is particularly relevant, as this may provide a more accurate indication than 2-year data of the proportion of women who participated regularly in cervical screening. This is because, under the previous NCSP, women were only reminded to screen 3 months after they missed a Pap test, not before their next Pap test was due.

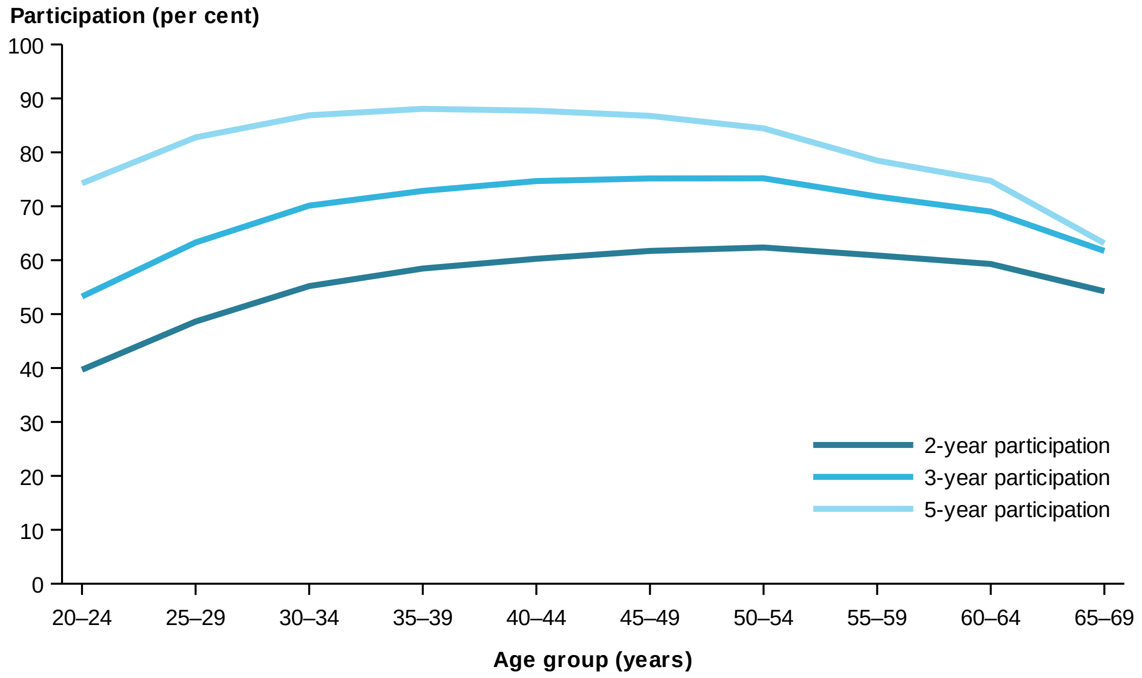
This reminder to screen took the form of a letter sent by a cervical screening register 27 months after a previous negative Pap test. There is evidence that it acts as a prompt to screen for many women, with the latest rescreening data indicating that 31.4% of women who were sent this reminder letter in 2016 presented for screening within 3 months.

Screening behaviour across ages

Age is an important determinant of screening behaviour. The effect of age on participation in cervical screening was very similar for 2-year and 3-year participation: 2-year participation (using 2015–2016 data) peaked at around 62% in women aged 45–49 and 50–54, and 3-year participation peaked at around 75% in women aged 40–44, 45–49 and 50–54. The age structure changed when participation was measured over 5 years. Higher participation was seen for younger age groups, and the highest participation of around 87%–88% occurred between the ages of 30–34 and 45–49 (Figure 3.1).

The effect of this is that the age group with the lowest participation changed from 20–24 for 2-year and 3-year participation to 65–69 for 5-year participation (Figure 3.1).

Figure 3.1: Participation of women aged 20–69, by age, over 2 years (2015–2016), 3 years (2014–2016) and 5 years (2012–2016)



Source: AIHW analysis of state and territory cervical screening register data. Data for this figure are available in Table A1.5.

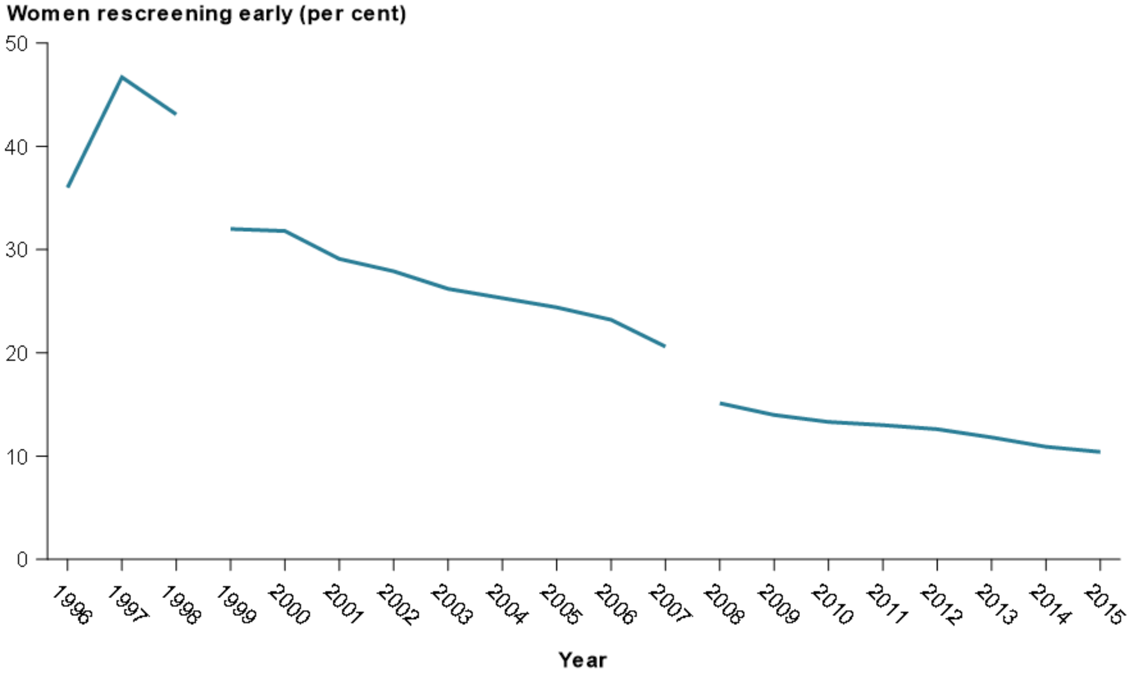
The level of screening in women aged 20–24 was relatively low; however, this is not considered a cause for concern as evidence shows that screening women aged 20–24 does not prevent any cervical cancers in women under age 25 (Landy et al. 2014). Further, Australia was one of the few countries that still screened women younger than 25. This will not occur under the current NCSP, for which a starting age of 25 has been adopted.

While the data show that many women participated in screening less often than recommended, some participated more often. The latest available data indicated that 10.4% of women with no history of disease in 2015 rescreened earlier than recommended. This represents a substantial decrease from 46.7% in 1997 (after the previous program commenced, with a recommendation of 2-yearly rather than annual Pap tests). Although there have been two changes to the definition of 'early rescreening' that affect direct comparisons, the overall trend shows a change in screening behaviour over time towards compliance with the previously recommended screening interval of 2 years.

More recent results are directly comparable as the same definition of early rescreening has been applied to them. They show that the proportion of women rescreening early decreased from 15.1% in 2008 to 10.4% in 2015 (Figure 3.2).

A low proportion of women rescreening early is desirable, since modelling has shown that a decrease in early rescreening reduces the cost of a screening program without changing its effectiveness (Creighton et al. 2010).

Figure 3.2: Proportion of women aged 20–69 rescreening early following a negative cervical cytology test, 1996 to 2015 cohorts



Note: Gaps in the line indicate a change in definition; direct comparison of trends on either side of these gaps is not recommended.

Source: AIHW analysis of state and territory cervical screening register data.

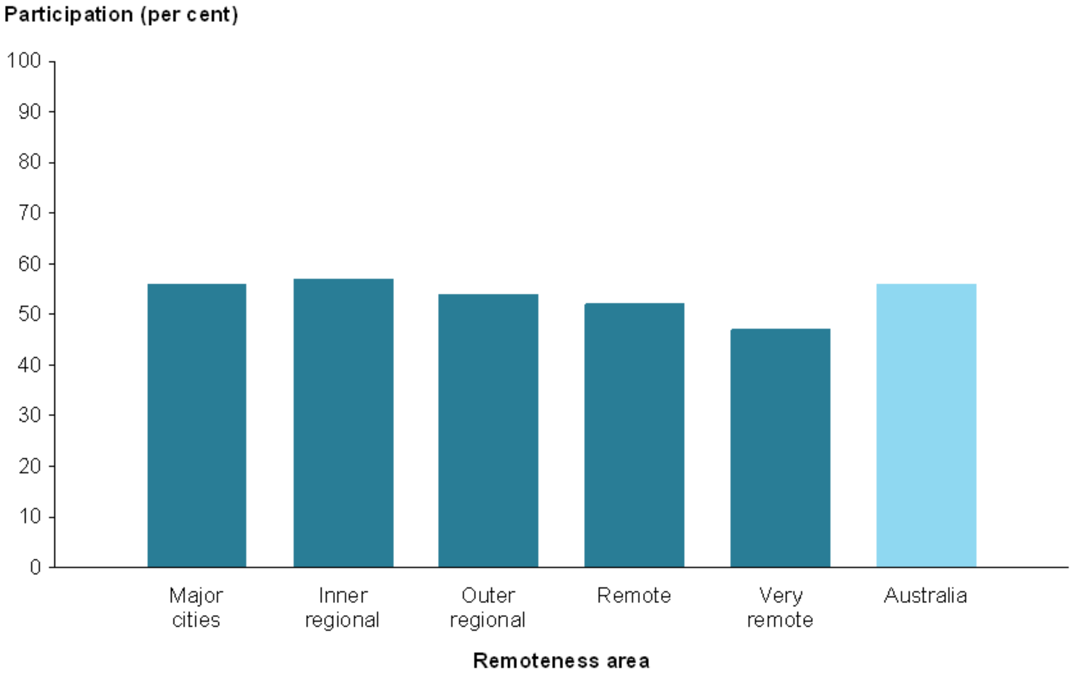
Screening behaviour across areas

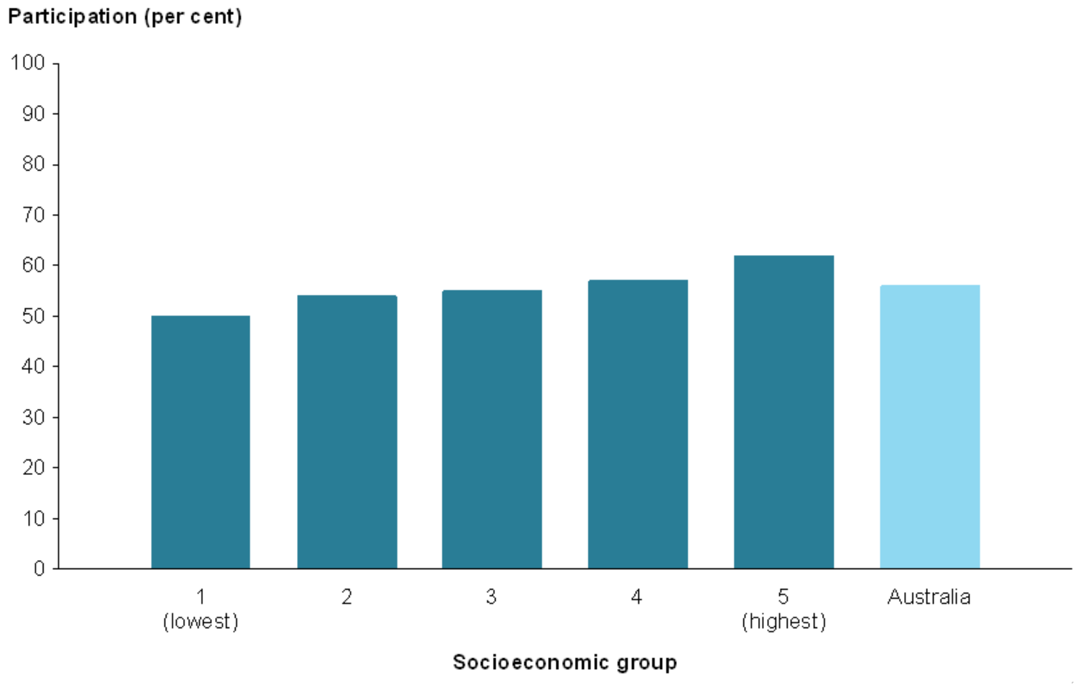
The latest available 2-year participation data for 2015–2016 are used for participation across areas.

Participation decreased with increasing remoteness, being highest in *Major cities* and *Inner regional* areas at 56.4% and 56.6%, respectively, and lowest in *Very remote* areas at 46.3% (Figure 3.3).

There was also a clear association between participation and socioeconomic group, with participation rising from 50.4% for women living in the lowest socioeconomic areas to 62.1% for those living in the highest socioeconomic areas (Figure 3.3).

Figure 3.3: Participation of women aged 20–69, by remoteness area, and by socioeconomic group, 2015–2016



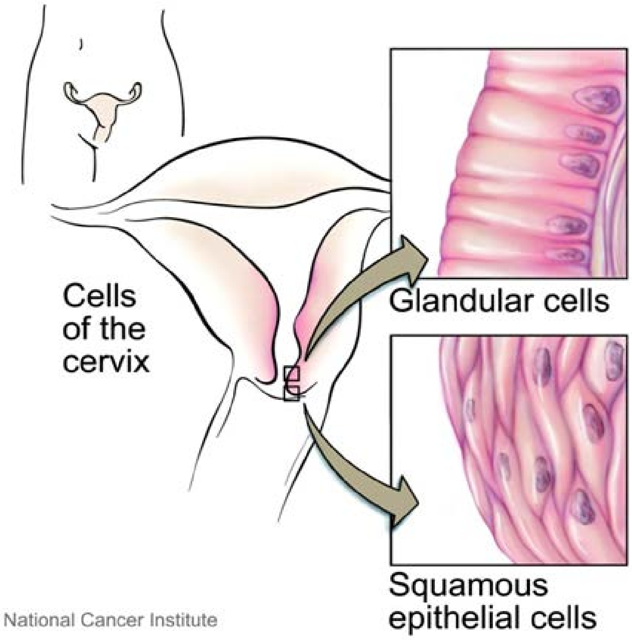


Source: AIHW analysis of state and territory cervical screening register data. Data for this figure are available in tables A1.3 and A1.4.

3.2 Characteristics of the screening test

The screening test of the NCSP before 1 December 2017 was the Pap test. The objective of the Pap test was to sample cells from the transformation zone of the cervix (CDHSH 1993), the area between the 'original' and 'current' squamocolumnar junctions of the cervix, in which the squamous cells meet the columnar glandular cells (most frequently referred to in this report as endocervical cells) (Figure 3.4). This is the site where cervical abnormalities and cancer are usually found.

Figure 3.4: Anatomy of the cells of the cervix and nearby organs



Source: http://visualsonline.cancer.gov.

The NCSP developed the National Cervical Cytology Coding Sheet based on the Australian Modified Bethesda System 2004 for reporting cervical cytology (NHMRC 2005). This coding sheet allowed pathologists to report on both the squamous and endocervical components of the cervical cytology sample, which, together, gave an overall cervical cytology result. This overall cytology result may indicate no abnormality, a squamous abnormality, an endocervical abnormality or (rarely) concurrent squamous and endocervical abnormalities.

The squamous cell and endocervical component reporting categories of the National Cervical Cytology Coding Sheet are shown in Table 3.2.

Table 3.2: Cytology reporting categories of the National Cervical Screening Program

Squamous cell	Endocervical component
SU Unsatisfactory	EU Unsatisfactory
	E0 No endocervical component
S1 Negative	E1 Negative
S2 Possible low-grade squamous intraepithelial lesion	E2 Atypical endocervical cells of uncertain significance
S3 Low-grade squamous intraepithelial lesion	
S4 Possible high-grade squamous intraepithelial lesion	E3 Possible high-grade endocervical glandular lesion
S5 High-grade squamous intraepithelial lesion	E4 Adenocarcinoma in situ
S6 High-grade squamous intraepithelial lesion with possible microinvasion/invasion	E5 Adenocarcinoma in situ with possible microinvasion/ invasion
S7 Squamous cell carcinoma	E6 Adenocarcinoma

Note: There is a further endocervical component result of E- that has been omitted, since this code indicates a vaginal vault smear, which is not included in the cervical cytology results presented.

Screening test results

Due to the transition of data from the previous NCSP to the current NCSP, data for this section are for the 6-month period 1 January 2017 to 30 June 2017 (instead of either the usual 12-month period to 31 December 2017, or to the end of the previous NCSP on 30 November 2017).

Although this does not present the same issue as participation data for which an appropriate denominator needed to be estimated (due to the denominators for screening test results being for the same 6 month period as the numerators) it is still possible for there to be differences between data that are measured over 6 months and those data measured over 12 months. Therefore the following cervical cytology data that are for 1 January 2017 to 30 June 2017 only may not be comparable with previous data that were for 12 months.

Most screening Pap tests were negative, meaning that no abnormality was present. This continued to be the case for 1 January 2017 to 30 June 2017, with 92.1% of the more than 1 million tests performed in those 6 months for women aged 20–69 being negative for cervical abnormalities.

While most Pap tests were negative, a proportion contained abnormal cells, this being influenced by the underlying prevalence of disease in the population.

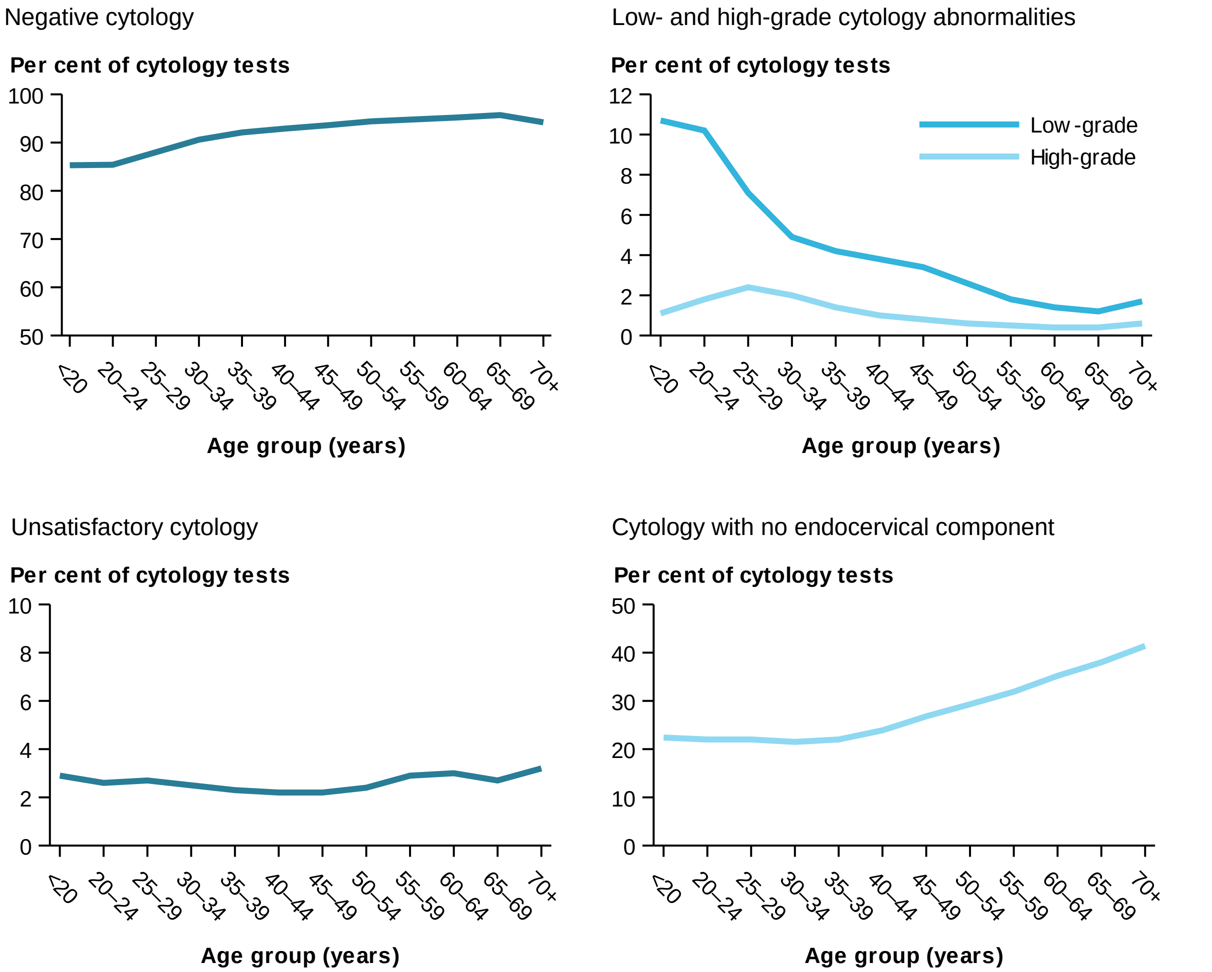
In the 6 months 1 January 2017 to 30 June 2017, for every 100 Pap tests performed, 5.5 abnormalities were detected. Low-grade abnormalities were more common, with 4.2 of every 100 Pap tests detecting these, while 1.2 of every 100 Pap tests detected a high-grade abnormality (cervical cancers comprised the remaining 0.1).

The age distribution of negative cytology results, as well as low-grade and high-grade cytology results, is shown in Figure 3.5.

An indication of quality is the proportion of Pap tests that were unsatisfactory—those from which the pathologist was unable to determine a clear result. This may be due to too few or too many cells, or to the presence of blood or other factors obscuring the cells, or to poor staining or preservation. Note that the absence of an endocervical component was not considered sufficient grounds to deem a cervical cytology sample unsatisfactory (NPAAC 2006). An unsatisfactory screening Pap test needed to be repeated, so it was desirable that these be minimised. In the 6 months 1 January 2017 to 30 June 2017 the proportion of Pap tests that were unsatisfactory was 2.5%.

While low, the proportion of unsatisfactory cytology tests increased slightly from 2.1%, where it had been for almost all years between 2004 and 2011, to stabilise at around 2.5% from the year 2015 to the six month period 1 January 2017 to 30 June 2017. This small increase occurred across all age groups, which means that the pattern of unsatisfactory tests by age remained the same, with more unsatisfactory tests in both the younger and older age groups (Figure 3.5).

Figure 3.5: Age distribution of negative cytology, low-grade and high-grade abnormalities detected by cytology, unsatisfactory cytology, and cytology with no endocervical component, January–June 2017



Source: AIHW analysis of state and territory cervical screening register data. Data for this figure are available in tables A3.7, A3.13, A3.14, A3.4 and A3.10.

It should be noted that this level of 2.5% falls well within the standards set by the National Pathology Accreditation Advisory Council (NPAAC) of between 0.5% and 5% (Table 3.3). The performance measures for unsatisfactory cytology, and for abnormalities detected by cytology, are detailed in Table 3.3, alongside crude rates for each measure that are calculated from data supplied for this report. From this table, it can be seen that all data in this report fall within the relevant standards set by NPAAC for the previous NCSP.

One measure not included as an NPAAC standard is the proportion of Pap tests that do not contain an endocervical component. This means that squamous cells were collected, but there were no (or insufficient) endocervical (glandular) cells, so only squamous cells could be assessed for the presence of cervical abnormalities or cancer.

In the 6 months 1 January 2017 to 30 June 2017, the proportion of Pap tests for which no endocervical component was collected continued to increase, from 17.4% in 2004 (available in the supplementary online data tables) to 26.2% of cytology tests performed from 1 January 2017 to 30 June 2017 for women aged 20–69. This trend holds after age-standardisation, from 17.9% in 2004 to 26.1% of cytology tests in 1 January 2017 to 30 June 2017.

The National Cancer Prevention Policy 2007–09 of the Cancer Council Australia (Cancer Council Australia 2007) states that 'presence of an endocervical component in 80% of Pap tests is generally considered acceptable'. The rate of 26% for the 6 months 1 January 2017 to 30 June 2017 indicates the presence of an endocervical component in 74% of cytology tests, which is outside this desired range.

It is recognised that an endocervical component can be difficult to collect in older women; just 2% of women aged over 64 have a transformation zone located on the ectocervix (Autier et al. 1996), due to the movement of the transformation zone with age. As sampling of the transformation zone is required for endocervical cells to be present in a cervical cytology sample, a transformation zone high up in the endocervical canal is likely to be more difficult to sample than a transformation zone on the ectocervix.

This does not explain, however, the increase in the proportion of cytology with no endocervical component across all age groups, including younger women who are likely to have a transformation zone located on the ectocervix.

Table 3.3: NPAAC performance measures 1 and 2b calculated using NCSP data supplied for *Cervical screening in Australia 2019*

NPAAC measure	Definition	Recommended standard	Calculated value
Performance measure 1	Proportion of specimens reported as unsatisfactory	Between 0.5% and 5% of all specimens reported as unsatisfactory	2.5% (26,179/1,042,985)
Performance measure 2b	(i) Proportion of specimens reported as definite and possible high-grade abnormality	(i) Not less than 0.7% reported as definite or possible high-grade abnormality	(i) 1.2% (12,661/1,042,985)
	(ii) Proportion of specimens reported as abnormal	(ii) Not more than 14% reported as abnormal	(ii) 5.5% (56,891/1,042,985)

Sources: AIHW analysis of state and territory cervical screening register data; NPAAC 2006.

Accuracy of cytology

Much can be learned about the screening test of the previous NCSP by examining how well the cytology 'prediction' matches the histology finding or 'truth'. Cervical cytology is only a prediction, as a screening test is not intended to be diagnostic; rather, it aims to identify women who are more likely to have a cervical abnormality or cervical cancer and therefore require further investigation from diagnostic tests. With this in mind, where cytology was followed by histology (either to confirm the presence or absence of disease as predicted by the cytology sample or for other clinical reasons, such as to investigate symptoms even in the absence of predicted disease), correlation between the cytology prediction and the histology finding (diagnosis) allowed the accuracy of cytological predictions to be assessed. This allowed a better understanding of the characteristics of the screening test of the previous NCSP.

Follow-up of cytology tests under the previous NCSP should have been according to the National Health and Medical Research Council's (NHMRC's) *Screening to prevent cervical cancer: guidelines for the management of asymptomatic women with screen-detected abnormalities* (NHMRC 2005); this means that most histology would have occurred after a cytology result of 'high-grade' or 'cancer'. There will have been exceptions, however, and these guidelines did not cover the management of symptomatic women.

A complete assessment of cytology would have required all cytology results (including negative) to be followed up by histology, but this is neither feasible nor desirable (as it would be unethical to require all women who had a Pap test to also undergo a biopsy). Rather, this assessment is restricted to cytology and histology results available on cervical screening registers, and is intended to provide measures that could be monitored annually to detect early indications of changes to the predictive ability of cervical cytology.

Due to the transition of data from the previous NCSP to the current NCSP, correlation data have not been updated for cytology tests performed in 2016, but instead are for cytology tests performed in 2015 as previously reported in *Cervical screening in Australia 2018*.

Correlation between squamous cytology results and any squamous histology performed within 6 months is shown in Figure 3.6, and correlation between endocervical cytology results and any endocervical histology performed within 6 months in Figure 3.7. These data do not include cytology tests not followed by histology (for which it is not possible to know the true disease state) or for cytology tests followed by histology more than 6 months after the cytology test.

The following commentary focuses on cytological predictions that were followed by histology within 6 months; however, in some places, data are provided as a proportion of all cytology predictions (regardless of whether or not histology was performed) to provide additional contextual information, and to aid in comparisons with other data of this type. For clarity, the text around the results clearly states which calculation has been used.

Squamous

Figure 3.6 indicates that squamous cytology was generally a good predictor of the histology finding. A cytology prediction of 'possible high-grade' was usually found to be high-grade, and a cytology prediction of 'high-grade' was almost always found to be high-grade; while 'squamous cell carcinoma' cytology was usually found to be squamous cell carcinoma. This makes the positive predictive value quite high: 67.1% of high-grade squamous abnormalities predicted by cytology that were biopsied within 6 months were found to be either a true high-grade squamous abnormality or squamous cell carcinoma (Table A5.3). Negative and low-grade abnormalities were not usually followed up with histology, so these results should not be considered indicative of all negative and low-grade cytology.

Of note, very few predictions of possible low-grade or low-grade cytology, for which there was histology performed within 6 months, were found to be cancer.

Possible and definite high-grade squamous abnormalities were usually followed up by colposcopy, and often by histology, so these results can be considered indicative.

The accuracy of possible high-grade squamous intraepithelial lesions (HSIL) predictions aligns with the pathologists' determination that these are only possible, and not definite, high-grade abnormalities; 51.0% of cytology predictions of possible HSIL in 2015 that were biopsied within 6 months were histologically confirmed as HSIL and 0.5% were confirmed as squamous cell carcinoma (Table A5.2). This was 38.4% and 0.4% of all possible HSIL predicted by cytology in 2015, respectively (including cytology where there was no histology performed within 6 months).

Definite HSIL predictions were more accurate: 77.8% of cytology predictions of HSIL in 2015 that were biopsied within 6 months were histologically confirmed as HSIL and 1.6% were confirmed as squamous cell carcinoma (Table A5.2). This was 67.3% and 1.4% of all HSIL predicted by cytology in 2015, respectively (including cytology where there was no histology performed within 6 months).

Almost all predictions of squamous cell carcinoma were confirmed as such: 22.9% of cytology predictions of squamous cell carcinoma in 2015 that were biopsied within 6 months were found to be HSIL on histology, and 71.2% of those biopsied within 6 months were confirmed as squamous cell carcinoma (Table A5.2). This was 20.0% and 62.2% of all squamous cell carcinoma predicted by cytology in 2015, respectively (including cytology where there was no histology performed within 6 months).

Endocervical

Figure 3.7 shows that endocervical cytology is also a reasonable predictor of the true disease state. This is despite abnormalities preceding adenocarcinoma being less well understood than the abnormalities preceding squamous cell carcinoma, and the adequate sampling and subsequent interpretation of endocervical cells being more difficult. These factors all affect the correlation between endocervical cytology and endocervical histology.

Possible high-grade glandular abnormality cytology was frequently found to be adenocarcinoma in situ (AIS), a cytology prediction of AIS was usually found to be AIS, and a cytology prediction of adenocarcinoma was usually found to be adenocarcinoma. This makes the positive predictive value also quite high: 72.7% of high-grade endocervical abnormalities predicted by cytology that were biopsied within 6 months were found, on histology, to be a true high-grade endocervical abnormality or adenocarcinoma (Table A5.6).

The cytology category 'atypical endocervical cells of uncertain significance' was used to indicate that abnormal endocervical cells were identified in the sample but that the significance of these was uncertain (meaning that these could be indicative of a serious abnormality, or could be associated with a benign change such as inflammation). This means that biopsy will not be the outcome for many women with this result. In the correlation for cases that were followed by histology, these atypical cells were sometimes found to be a serious abnormality, but often found to be not associated with any abnormality. For example, 18.8% of cases of atypical endocervical cells of uncertain significance predicted by cytology in 2015 that were biopsied within 6 months were found to be AIS and 4.3% were found to be adenocarcinoma (Table A5.5). This was 6.6% and 1.5% of all cases of atypical endocervical cells of uncertain significance predicted by cytology in 2015, respectively (including cytology where there was no histology performed within 6 months).

A cytology prediction of possible high-grade endocervical abnormality was frequently found to be AIS or worse: 42.1% of cytology predictions of possible high-grade endocervical glandular lesion in 2015 that were biopsied within 6 months were histologically confirmed as AIS and 14.0% were confirmed as adenocarcinoma (Table A5.5). This was 20.4% and 6.8% of all possible high-grade endocervical glandular lesions predicted by cytology in 2015, respectively (including cytology where there was no histology performed within 6 months).

Predictions of AIS were often found to be AIS or adenocarcinoma: 69.9% of cytology predictions of AIS in 2015 that were biopsied within 6 months were histologically confirmed as AIS and 19.2% were confirmed as adenocarcinoma (Table A5.5). This was 59.5% and 16.4% of all possible high-grade endocervical glandular lesions predicted by cytology in 2015, respectively (including cytology where there was no histology performed within 6 months).

Almost all predictions of adenocarcinoma were confirmed as such: 16.7% of cytology predictions of adenocarcinoma in 2015 that were biopsied within 6 months were found to be AIS on histology, and 63.9% were confirmed as adenocarcinoma (Table A5.5). This was 8.2% and 31.5% of all adenocarcinoma predicted by cytology in 2015, respectively (including cytology where there was no histology performed within 6 months).

Standards

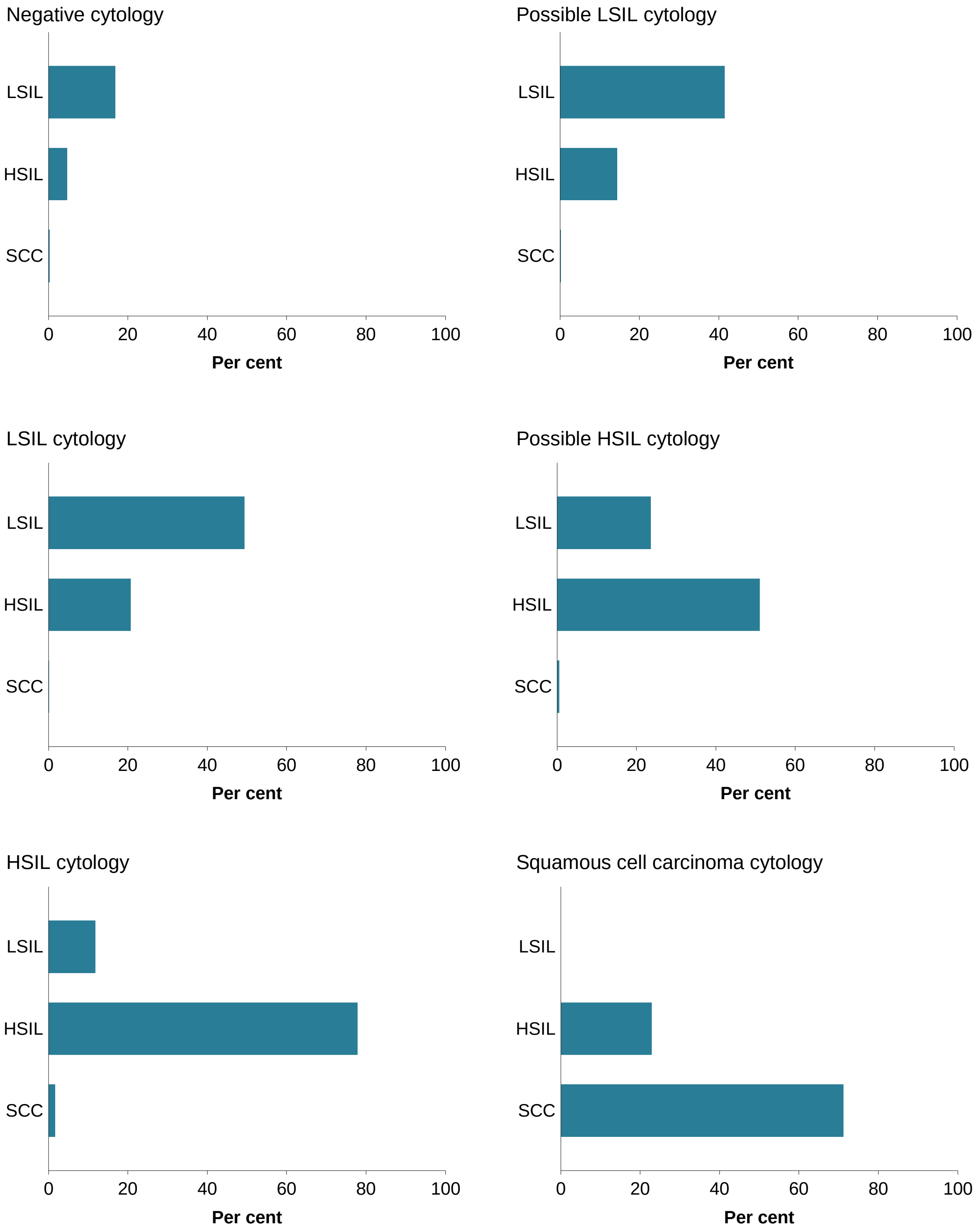
The two NPAAC standards that relate to the correlation data analysed are detailed in Table 3.4, together with the crude rates for each measure, calculated from data supplied for *Cervical screening in Australia 2018* (separately for squamous and endocervical). It can be seen that these data fall within the respective standards set by NPAAC for the previous NCSP.

Table 3.4: NPAAC performance measures 3a and 3b calculated using NCSP data supplied for *Cervical screening in Australia 2018*

NPAAC measure	Definition	Recommended standard	Calculated value
Performance measure 3a	Proportion of cytology specimens reported as a definite high-grade intraepithelial abnormality where cervical histology, taken within 6 months, confirms the abnormality as high-grade intraepithelial abnormality or malignancy.	Not less than 65% of cytology specimens with a definite cytological prediction of a high-grade intraepithelial abnormality are confirmed on cervical histology, which is performed within 6 months, as having a high-grade intraepithelial abnormality or malignancy.	Squamous cytology and histology = 79.4% (9,377/11,811) Endocervical cytology and histology = 89.1% (204/229)
Performance measure 3b	Proportion of cytology specimens reported as a possible high-grade intraepithelial abnormality where cervical histology, taken within 6 months, confirms the abnormality as high-grade intraepithelial abnormality or malignancy.	Not less than 33% of cytology specimens with a cytological prediction of a possible high-grade intraepithelial abnormality are confirmed on cervical histology, which is performed within 6 months, as having a high-grade intraepithelial abnormality or malignancy.	Squamous cytology and histology = 51.5% (5,020/9,751) Endocervical cytology and histology = 56.1% (128/228)

Sources: AIHW analysis of state and territory cervical screening register data; NPAAC 2006.

Figure 3.6: Correlation of squamous cytology prediction with squamous histology finding for women aged 20–69, cytology performed in 2015

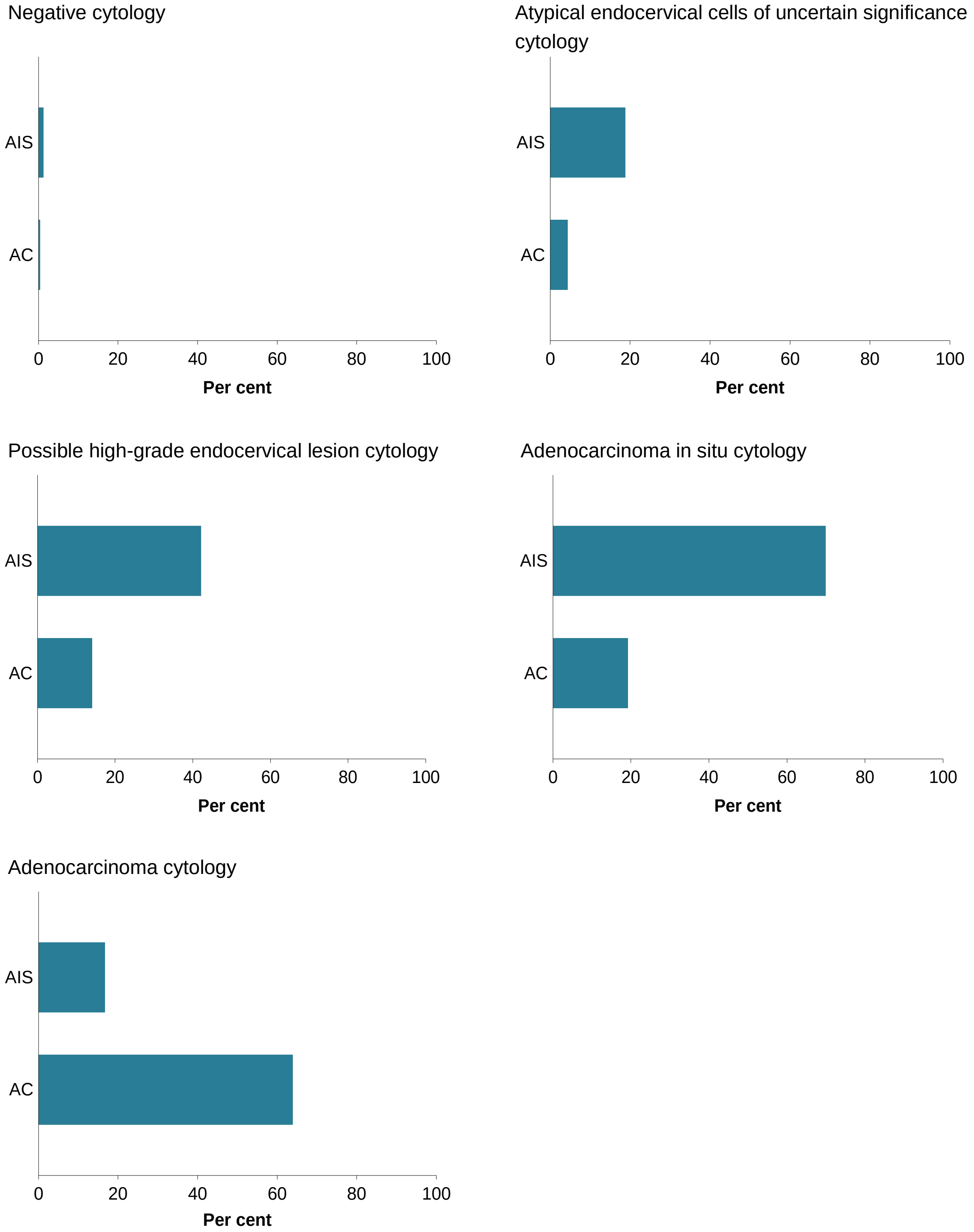


LSIL = low-grade intraepithelial lesion (low-grade abnormality); HSIL = high-grade intraepithelial lesion (high-grade abnormality);
SCC = squamous cell carcinoma

Note: Data include only cytology where histology was performed within 6 months; cytology not followed by histology or followed by histology more than 6 months after cytology are not included in the calculations.

Source: AIHW analysis of state and territory cervical screening register data. Data for this figure are available in Table A5.2.

Figure 3.7: Correlation of endocervical cytology prediction with endocervical histology finding for women aged 20–69, cytology performed in 2015



AIS = adenocarcinoma in situ; AC = adenocarcinoma

Note: Data include only cytology where histology was performed within 6 months; cytology not followed by histology or followed by histology more than 6 months after cytology are not included in the calculations.

Source: AIHW analysis of state and territory cervical screening register data. Data for this figure are available in Table A5.5.

3.3 Detection of high-grade abnormalities

It was previously thought that the development of cervical cancer involved progression from low-grade to moderate-grade to high-grade abnormalities; it is now understood that low-grade and high-grade abnormalities represent different HPV infection processes. Low-grade abnormalities occur as a result of acute HPV infection, most of which will resolve spontaneously. High-grade abnormalities are the result of persistent infection with an oncogenic HPV type. Most high-grade abnormalities also regress over time (Raffle et al. 2003), but regression takes longer (Cancer Council Australia 2014). An important difference between non-oncogenic and oncogenic HPV types is that oncogenic HPV types integrate their DNA into the host genome, which is why these are associated with oncogenic changes to the cells of the cervix, whereas non-oncogenic HPV types are unable to integrate their DNA into the host genome and therefore can only cause low-grade changes to cells (Chhieng & Hui 2011).

As high-grade abnormalities are potential precursors to cervical cancer, their detection through cervical screening provides an opportunity for treatment before cancer can develop. Thus, the NCSP aims to detect high-grade abnormalities in line with its broader aim to reduce the incidence of cervical cancer. Detection of high-grade abnormalities in this context is by histology, not by cytology. This is because cytology is not diagnostic and may under-call or over-call true disease (as evident in the cytology–histology correlation data in Section 3.2).

Histology is the primary diagnostic tool of the NCSP (both previous and current), and confirmation of disease is required before any treatment is initiated, both to ensure treatment is appropriate and to avoid unnecessary treatment in women where the cytology has predicted disease that is not present. While colposcopy (examination of the cervix using a magnifying instrument called a colposcope) is used as part of this process, in Australia, it is considered best practice to confirm high-grade disease with histology before treatment (NHMRC 2005). Unlike cytology, which has nationally consistent reporting through the Australian Modified Bethesda System 2004, state and territory cervical screening registers have different coding systems for histology. These have been mapped to a national histology coding system. The squamous and endocervical reporting categories of the NCSP national histology coding system are shown in Table 3.5.

Table 3.5: Histology reporting categories of the National Cervical Screening Program

Squamous	Endocervical
HSU Unsatisfactory	HEU Unsatisfactory
HS01 Negative	HE1 Negative
HS02 Low-grade squamous abnormality	HE02 Endocervical atypia
HS03.1 High-grade squamous abnormality, cervical intraepithelial neoplasia (CIN) not otherwise specified (NOS)	HE03.1 High-grade endocervical abnormality, endocervical dysplasia
HS03.2 High-grade squamous abnormality, CIN II	HE03.2 High-grade endocervical abnormality, adenocarcinoma in situ
HS03.3 High-grade squamous abnormality, CIN III	
HS04.1 Squamous cell carcinoma, microinvasive	HE04.1 Adenocarcinoma, microinvasive
HS04.2 Squamous cell carcinoma, invasive	HE04.2 Adenocarcinoma, invasive
	HE04.3 Adenosquamous carcinoma
	HE04.4 Carcinoma of the cervix (other)

Note: There is a further result of HE03.3 to allow the collection of mixed high-grade histology (carcinoma in situ/adenocarcinoma in situ) which has been omitted since this category is not included in the cervical histology results presented.

The high-grade abnormality detection rate of the NCSP is the number of women with a high-grade abnormality detected by histology per 1,000 women screened. High-grade abnormalities of the cervix include cervical intraepithelial neoplasia (CIN) that have been graded as moderate (CIN II) or severe (CIN III), or for which the grade has not been specified, as well as endocervical dysplasia and adenocarcinoma in situ.

Usually measured over a 12-month period, histology has been measured over the 6-month period 1 January 2017 to 30 June 2017 in this report, similar to cytology. This means that the high-grade abnormality detection rate may not be comparable with previous data.

In the 6 months 1 January 2017 to 30 June 2017, a high-grade abnormality was detected by histology in 7,105 women aged 20–69, which equates to 7.0 women with a high-grade abnormality detected by histology per 1,000 screened. This means that, for every 1,000 women screened, 7 had a high-grade abnormality discovered, providing an opportunity for treatment before possible progression to cervical cancer.

After remaining between 7 and 8 for all years from 2005 to 2007, the number of women aged 20–69 with a high-grade abnormality detected by histology per 1,000 women screened increased to above 8 from 2008, where it remained from 2008 to 2014. It is not clear why there was an increase in high-grade abnormality detection for those years. Contributing factors may include the increased use of immunohistochemistry, which can assist in the confirmation of high-grade abnormalities.

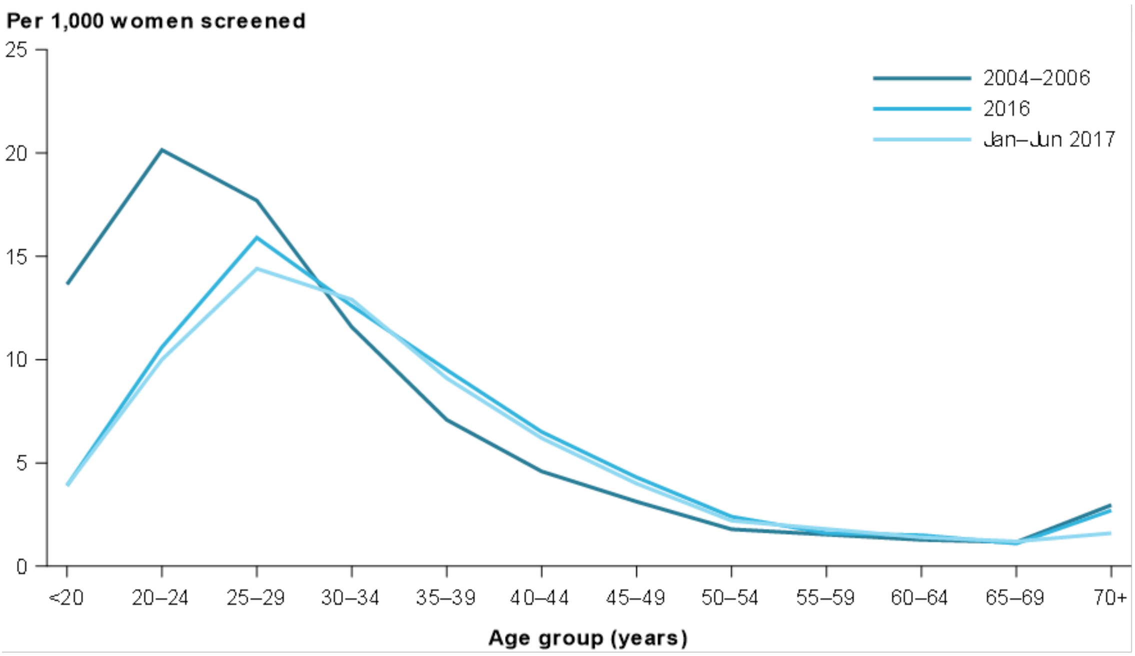
In contrast with the overall trend of increasing detection over time, there was a steady decline in high-grade abnormality detection in younger women. In those aged under 20, this decrease commenced from the year 2007, falling from 11.6 in that year to 3.9 women with high-grade histology per 1,000 women screened in 2016 and 1 January 2017 to 30 June 2017. More recently there was also a decline for women aged 20–24, from 19.7 in 2010 to 10.0 in 1 January 2017 to 30 June 2017. This latter trend notably changed the historical peak age of high-grade histological abnormalities from women aged 20–24 to women aged 25–29.

For the first time, in 2014, there was also a decrease in high-grade abnormality detection in women aged 25–29, from 20.3 in 2013 to 18.5 in 2014, a trend which has continued, reaching a detection rate of 14.4 in 1 January 2017 to 30 June 2017. This is the lowest detection rate for this age group since it rose to 19–20 for all years from 2008 to 2013. There has also been a decrease for women aged 30–34 from 14.1 in 2014 to 12.9 in 1 January 2017 to 30 June 2017. The decrease in high-grade abnormalities in younger women is likely to be due to girls being vaccinated against HPV under the National HPV Vaccination Program, during either the ‘school-based’ or ‘catch-up’ program, as these women are expected to experience fewer abnormalities, a trend noted by Brotherton et al. (2011) and Gertig et al. (2013). Visible in the under-20 age group several years ago, this is now clearly contributing to results for the 20–24 age group and has started contributing to results for the 25–29 age group and, more recently, the 30–34 age group.

This change in age structure is illustrated in Figure 3.8, which shows the detection of high-grade abnormalities by age over the period 2004–2006 (before the introduction of the National HPV Vaccination Program) and in 2016 and 1 January 2017 to 30 June 2017, which demonstrates this shift in peak age of detection from 20–24 to 25–29.

In addition, this continued decrease in rates for the younger age groups appears to be affecting the overall high-grade abnormality detection rate, despite the other factors that have driven it up, as the latest age-standardised rates of 7.8 for 2015, 7.4 for 2016 and 7.1 for 1 January 2017 to 30 June 2017 are the first below 8 since 2007.

Figure 3.8: High-grade abnormality detection rate by age, 2004–2006, 2016 and January–June 2017



Source: AIHW analysis of state and territory cervical screening register data. Data for this figure are available in Table A4.8.

Looking in more detail at the change in the high-grade detection rate by age, using the 3 years 2004–2006 as the pre-vaccination comparator, the decrease in women aged under 20 was small but perceptible from 2007, the first year of the National HPV Vaccination Program. The change has become larger each year, to reach a decrease of 9.7 women with a high-grade abnormality detected per 1,000 women screened in 2016 and again in the 6 months 1 January 2017 to 30 June 2017 (Table 3.6).

For women aged 20–24, a notable decrease began in 2011, reaching a decrease of 10.2 in 1 January 2017 to 30 June 2017 (Table 3.6). Data for the age groups 25–29 and 30–34 are deceptive: despite showing clear decreases in more recent years (Table A4.8), women aged 25–29 experienced a decrease of only 3.3 and women aged 30–34 no decrease. This is because Table 3.6 compares data for 1 January 2017 to 30 June 2017 with that for 2004–2006, when these age groups had relatively low detection rates of 17.7 and 11.6 per 1,000 women screened, respectively.

Table 3.6: Change in high-grade abnormality detection per 1,000 women screened, 2004–2006 to January–June 2017

Age group	2004–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	January – June 2017
						Change from 2004–2006						
<20	13.6	–2.0	–2.8	–4.7	–5.8	–6.5	–7.3	–7.9	–8.6	–9.5	–9.7	–9.7
20–24	20.1	–1.2	1.2	–0.2	–0.5	–2.7	–4.3	–5.1	–7.2	-8.3	–9.5	–10.2
25–29	17.7	0.1	1.6	1.3	2.2	1.8	2.3	2.6	0.8	0.0	–1.8	–3.3
30–34	11.6	–0.1	1.1	1.2	2.1	2.4	2.2	2.9	2.6	1.9	1.0	1.3

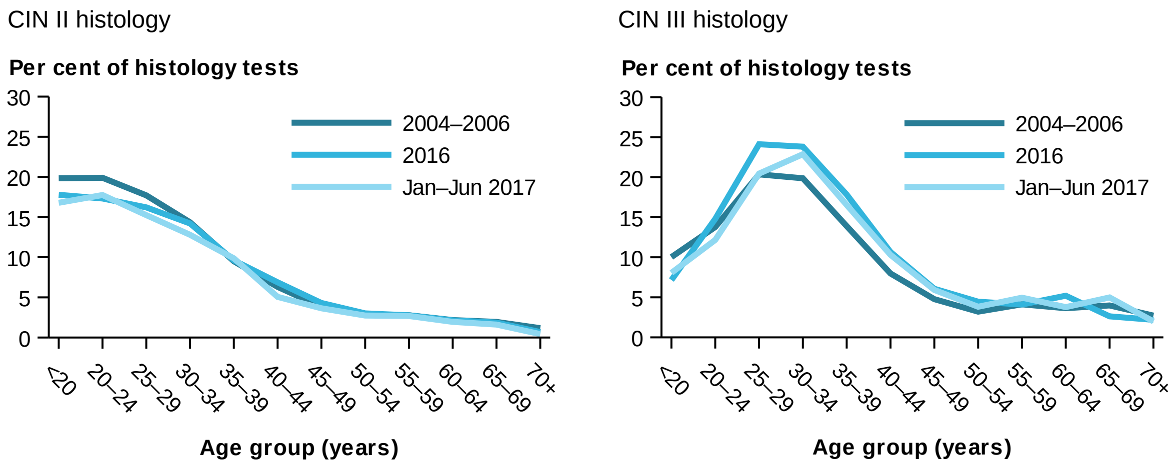
Note: Change from the 2004–2006 data is shown for age groups <20 to 30–34 from 2007 to January to June 2017. A negative symbol indicates that the change is a decrease; no symbol indicates that the change is an increase.

Source: AIHW analysis of state and territory cervical screening register data.

To gain further information about which abnormalities are contributing to this trend in young women, the most common high-grade abnormalities, cervical intraepithelial neoplasia graded as ‘moderate’ (CIN II) and ‘severe’ (CIN III), were examined. While not directly comparable, as CIN II and CIN III data are the *number of abnormalities* as a percentage of the number of histology tests and the high-grade abnormality detection data are the *number of women* with a high-grade abnormality per 1,000 women screened, these can be used to understand the relative contribution of these two abnormalities.

From the two graphs in Figure 3.9, it can be seen that decreases in both CIN II and CIN III in women aged under 20 have contributed to the overall decrease in high-grade abnormalities detected in this age group, with a similar decrease in CIN II in women aged 25–29 also coinciding with the decrease in high-grade abnormality detection. Of note, between the reference period of 2004–2006 and recent years, there has been a clear increase in CIN III histology from ages 25–29 onwards, which coincides with the overall increase in high-grade abnormality detection noted above, the reason for which remains unclear (although from Figure 3.9 it appears that CIN II has not contributed to this trend).

Figure 3.9: Detection of CIN II or CIN III per 100 histology tests, 2004–2006, 2016 and January–June 2017



Note: As some states and territories receive data in a format that does not allow them to distinguish between the histology results of CIN II and CIN III, these data are only from those states and territories where CIN II and CIN III can be distinguished.

Source: AIHW analysis of state and territory cervical screening register data.

3.4 Expenditure on cervical screening

In Australia, screening is recommended for 3 cancers: breast, cervical and bowel. Each cancer has a national screening program, with both Australian Government and state and territory government components.

The Australian Government provides funding to the states and territories for public health services through National Health Reform Payments (known as National Specific Purpose Payments prior to 1 July 2012) and National Partnership Payments. State and territory governments have full discretion over the application of National Health Reform Payments for public health funding, including the amount expended on the NCSP.

Table 3.7 shows expenditure for the 3 national cancer screening programs (expenditure by Australian and state and territory governments combined), as well as total expenditure on cancer screening for the 2016–17 financial year.

In 2016–17, an estimated $90.1 million was spent on cervical screening in Australia.

Of this $90.1 million, $37.4 million was spent on Medicare Benefits Schedule (MBS) items for cervical screening.

Table 3.7: Government funding for cancer screening programs, 2016–17, $ million

Screening program	Australian Government	State and territory governments	Total expenditure for 2016–17
BreastScreen Australia[(a)(b)]	**18.1**	**293.3**	**311.4**
National Cervical Screening Program[(c)]	**52.2**	**37.8**	**90.1**
MBS items for cervical screening	*37.4*		
PIP incentive payments for cervical screening	*5.0*		
Assist Victoria in funding the Victorian Cytology Service	*9.8*		
National Bowel Cancer Screening Program[(d)(e)]	**68.4**	**5.9**	**74.2**

(a) Excludes MBS items for breast cancer screening that occurs outside BreastScreen Australia.

(b) For BreastScreen Australia, the Australian Government figure only includes direct expenditure on the program by the government, and not the funding provided to the states and territories through the National Healthcare Agreement.

(c) Excludes the proportion of the costs associated with general practitioner, specialist and nurse attendances that would have been for Pap smears.

(d) Excludes MBS items for bowel screening that occurs outside the National Bowel Cancer Screening Program.

(e) Includes payments from the Australian Government to the states and territories for the National Bowel Cancer Screening Program.

Sources: AIHW Health expenditure database; Medicare Australia statistics.

3.5 HPV vaccination

While it is a separate program from the NCSP, the National Immunisation Program (NIP) supports the cervical screening program through the provision of free HPV vaccines for young Australians. Through vaccination against HPV, the NIP provides primary prevention of cervical cancer; secondary prevention is provided by cervical screening through the NCSP.

In addition to the shared aim of reducing the incidence of cervical cancer, HPV vaccination has a significant impact on the outcomes of the NCSP, such as the effect of HPV vaccination on high-grade abnormalities (see Section 3.3). It is therefore relevant to report on HPV vaccination rates in Australia in this publication. These are sourced from the coverage data that were published routinely by the VCS Foundation, which operated the National HPV Vaccination Program Register until it was closed on 31 December 2018 (National HPV Vaccination Program Register 2018) (HPV vaccination data were thereafter provided to the Australian Immunisation Register).

As shown in Table 3.8, as at September 2018, national HPV vaccination coverage in 2017 for female adolescents turning 15 years of age is high. HPV vaccination coverage has been increasing since 2012, with an 80.2% 3-dose coverage rate for females recorded in 2017. As expected, coverage decreases with increasing number of doses; in 2017 vaccine coverage for 1 dose was 88.9%, for 2 doses 86.0%, and for 3 doses 80.2% (National HPV Vaccination Program Register 2018).

Table 3.8: National HPV vaccination coverage for female adolescents turning 15 years of age

Year	Coverage Dose 1	Coverage Dose 2	Coverage Dose 3
2012	82.7	79.2	71.5
2013	82.1	78.4	71.7
2014	83.7	80.3	74.1
2015	86.4	83.7	78.0
2016	86.5	83.8	78.6
2017	88.9	86.0	80.2

Notes

1. Coverage is calculated as doses administered and reported to the HPV Register/Estimated Resident Population, expressed as a percentage.
2. Year is the year in which females turn 15 years of age; 15 years of age is used as the age for routine review of vaccination coverage that provides the best comparison to allow for these varying ages in administration, as per World Health Organization recommendations.

Sources: National HPV Vaccination Register 2018; Victorian Cytology Service 2018.

In 2018, Australia commenced using the new nonavalent HPV vaccine, *Gardasil9,* replacing the quadrivalent vaccine, *Gardasil,* thereby protecting against an additional 5 strains of HPV (types 6, 11, 16, 18, 31, 33, 45, 52 and 58). The program began in line with the school year, and reduces the number of doses from 3 to 2 (spaced 6–12 months apart). The introduction of this vaccine will further improve the protection that females vaccinated against HPV have against the development of CIN and cervical cancer. A recent study suggested that up to 93% of cervical cancers in Australia are associated with the HPV types covered by the new vaccine (Brotherton et al. 2017). In addition, by moving to the nonavalent vaccine, and decreasing the number of recommended doses, the rate of compliance with the vaccination schedule is expected to increase.

For further and more detailed HPV vaccination coverage rates, visit the National HPV Vaccination Register webpage http://www.hpvregister.org.au/research/coverage-data.

For HPV vaccination rates by small geographic areas, visit the AIHW webpage https://www.myhealthycommunities.gov.au/our-reports/HPV-rates/march-2018.

4 Key cervical cancer outcomes

4.1 Incidence of cervical cancer

Australia has high-quality and virtually complete cancer incidence data. Collected by state and territory cancer registries, clinical and demographic data for all cancer cases are provided to the AIHW and compiled in the Australian Cancer Database (ACD). Data in this section are sourced from the 2015 version of the ACD.

The latest national data available are for new cases in 2015; in this latest year, 857 new cases of cervical cancer were diagnosed in Australia. This is equivalent to 7.1 new cases for every 100,000 women in the population, which, when age-standardised to allow analysis over time and between population groups, equates to an incidence rate of 7.0 for 2015.

Of the 857 new cases, 727 occurred in women aged 20–69 (the target population of the previous NCSP). This is equivalent to 9.3 new cases for every 100,000 women in the population or 9.6 new cases per 100,000 women when age-standardised.

Box 4.1: Estimated incidence to 2019

Incidence data are also estimated to the current year of reporting, based on 2006–2015 incidence data. (Note that actual incidence data for 2016–2019 may differ from estimated data for these years due to current and ongoing program or practice changes.)

In 2019, it is estimated that there will be 951 new cases of cervical cancer, equivalent to 7.2 new cases per 100,000 women (age-standardised).

Of these 951 new cases, it is estimated that 810 will occur in women aged 20–69, equivalent to 10.0 new cases per 100,000 women (age-standardised).

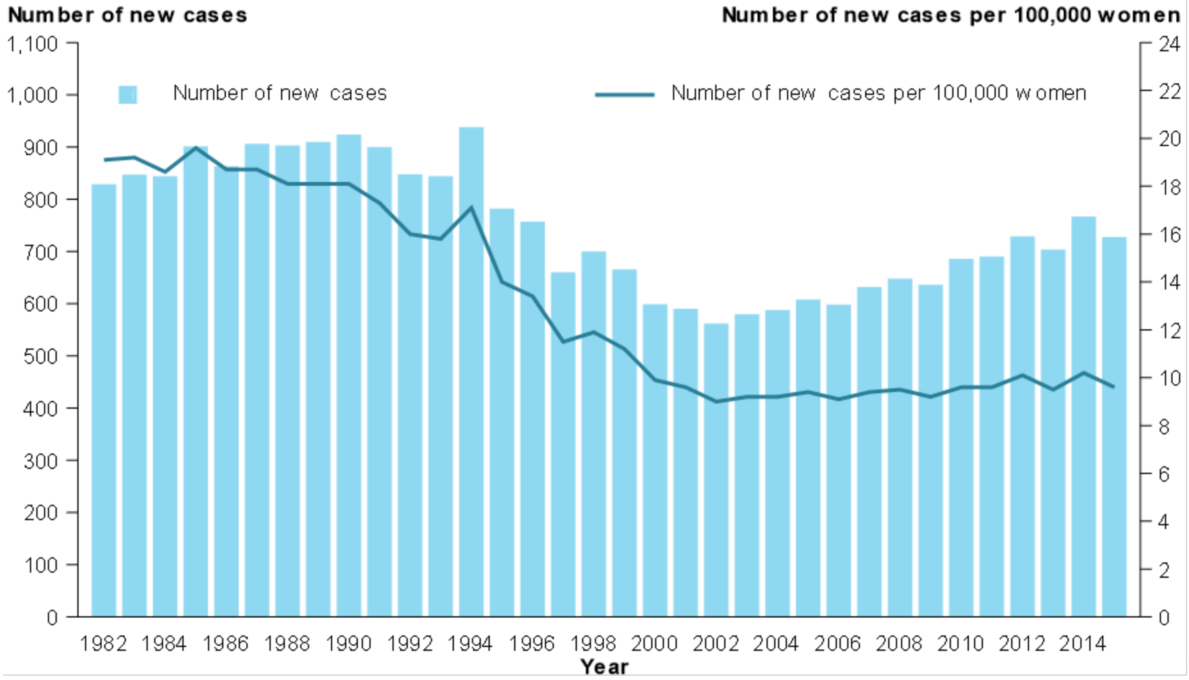
Cervical cancer over time

There was a modest decrease in the age-standardised incidence of cervical cancer for women aged 20–69 between 1982 and 1990, from 19.1 to 18.0 new cases per 100,000 women. This is likely to have been a result of the ad-hoc cervical screening that occurred in Australia from the 1960s to 1990. However, it was with the introduction of organised cervical screening through the NCSP in 1991 that the greatest decreases in incidence occurred, with a rapid decrease to 9.0 new cases per 100,000 women by 2002, just over a decade after the national program commenced (Figure 4.1).

Incidence remained steady for this age group at around 9–10 new cases per 100,000 women (Figure 4.1).

Incidence for women of all ages has been steady at around 7 new cases per 100,000 women from 2002 to 2015.

Figure 4.1: Incidence of cervical cancer in women aged 20–69, 1982 to 2015



Note: Rates age-standardised to the Australian population as at 30 June 2001. Data for 2015 are estimated for NSW.

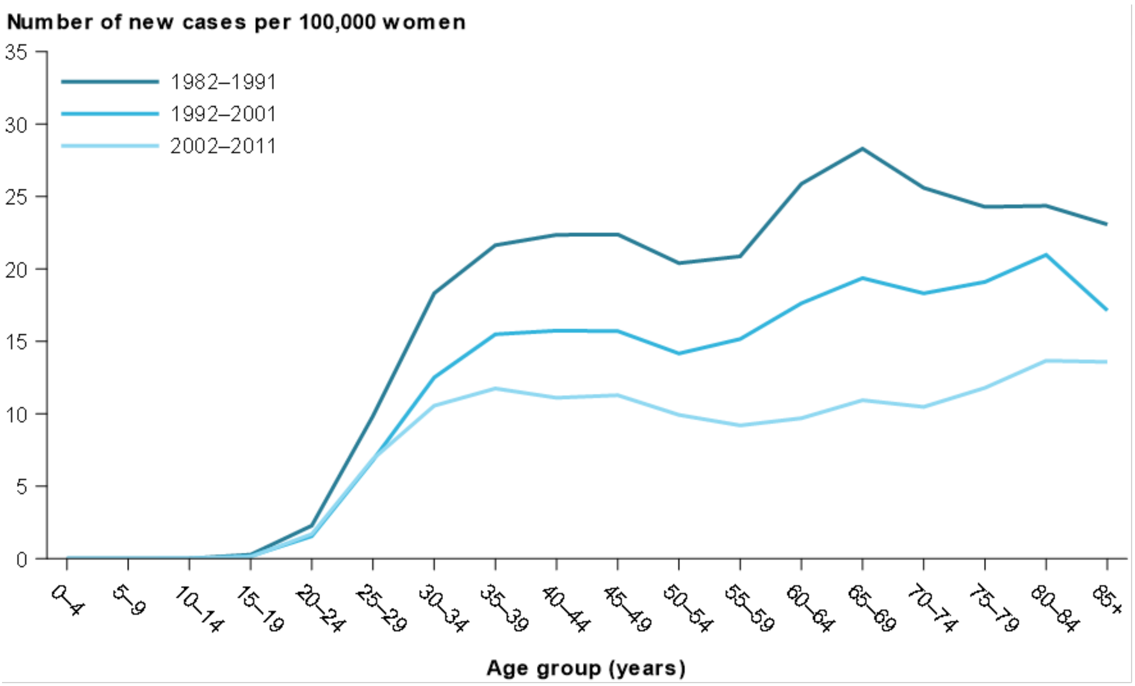
Source: AIHW Australian Cancer Database 2015. Data for this figure are available in Table A6.1.

The decrease in incidence over time, which has been attributed to the NCSP, has been accompanied by a decrease in the ranking of cervical cancer—from the sixth most common cancer in women in 1982 to the 14th most common in 2015—and a decrease in the risk of diagnosis before age 85 from 1 in 74 in 1982 to 1 in 162 in 2015 (AIHW 2018a).

These changes are consistent with the introduction of organised cervical screening programs internationally; however, cervical cancer remains one of the most common cancers in women in countries that do not have organised cervical screening, and fourth overall, so the worldwide burden is still high (IARC 2014), even with successes such as those in Australia.

The effect of the NCSP on the age distribution of cervical cancer incidence is illustrated in Figure 4.2. In addition to decreasing incidence across all age groups, before the introduction of the NCSP (between 1982 and 1991) there was a clear second (and higher) peak in incidence in women aged 60 and over. This has decreased substantially over time, due to cervical screening either detecting these cervical cancers earlier or preventing their occurrence altogether.

Figure 4.2: Incidence of cervical cancer, by age group, 1982–1991, 1992–2001 and 2002–2011



Note: Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW Australian Cancer Database 2015.

Cervical cancer types

While all cervical cancers share the site code C53 under the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision* (ICD-10), there are several histological subtypes within the category of cervical cancer, with clear differences in clinical behaviour (Blomfield & Saville 2008). Histology codes for cancers are collected in the ACD, which allows the analysis of trends in cervical cancer incidence for different histological types. The histological types presented are based on the histological groupings for cervical cancer set out in Chapter 4 of *Cancer incidence in five continents: vol. IX* (Curado et al. 2007), with histological types marked by the type of cell in which the cancer originates. Thus, cervical cancer has been disaggregated into the following broad histological types: carcinoma (cancers of epithelial origin), sarcoma (cancers originating in connective tissue such as bone, muscle and fat), and other specified and unspecified malignant neoplasms (unusual cancers and cancers too poorly differentiated to be classified). Carcinoma has been further split into squamous cell carcinoma (which arises from the squamous cells that cover the outer surface of the cervix), adenocarcinoma (which arises from the glandular (columnar) cells in the endocervical canal), adenosquamous carcinoma (which contains malignant squamous and glandular cells), and other carcinoma.

Table 4.1 differs slightly from that presented in *Cancer incidence in five continents: vol. IX*; namely, other specified and unspecified carcinomas are grouped together, as are other specified and unspecified malignant neoplasms. Further, adenosquamous carcinoma has been listed as a separate group under ‘Carcinoma’, rather than included in ‘Other specified carcinoma’ as specified in Curado and others (2007). The latter change is to allow the carcinoma histological groupings to be consistent with the cervical cancer types collected by the cervical cytology registries and reported under the ‘Histology’ performance indicator.

Table 4.1: Incidence of cervical cancer in women aged 20–69, by histological type, 2015

Type of cervical cancer	New cases	AS rate	% of cervical cancers	% of carcinomas
1: Carcinoma	713	9.6	98.1	100.0
1.1: Squamous cell carcinoma	495	6.5	68.1	69.4
1.2: Adenocarcinoma	176	2.3	24.2	24.7
1.3: Adenosquamous carcinoma	19	0.3	2.6	2.7
1.4: Other specified and unspecified carcinoma	23	0.3	3.2	3.2
2: Sarcoma	2	0.0	0.3	. .
3: Other specified and unspecified malignant neoplasm	13	0.2	1.8	. .
Total	**727**	**9.6**	**100.0**	**. .**

'Carcinoma' = International Classification of Diseases for Oncology, Third Edition (ICD-O-3) codes 8010–8380, 8382–8576

'Squamous cell carcinoma' = ICD-O-3 codes 8050–8078, 8083–8084

'Adenocarcinoma' = ICD-O-3 codes 8140–8141, 8190–8211, 8230–8231, 8260–8263, 8382–8384, 8440–8490, 8570–8574, 8310, 8380, 8576

'Adenosquamous carcinoma' = ICD-O-3 code 8560

'Other specified and unspecified carcinoma' = ICD-O-3 codes for carcinoma, excluding those for squamous cell carcinoma, adenocarcinoma and adenosquamous carcinoma

'Sarcoma' = ICD-O-3 codes 8800–8811, 8840–8921, 8990–8991, 9040–9044, 9120–9133, 9540–9581, 8830, 9150

'Other specified and unspecified malignant neoplasm' = ICD-O-3 codes for cervical cancer, excluding those for carcinoma and sarcoma

Note: Age-standardised (AS) rate is the number of new cases per 100,000 women, age-standardised to the Australian population as at 30 June 2001. Rates based on fewer than 20 new cases should be interpreted with caution. Numbers may not add to total due to rounding. Data for 2015 are estimated for NSW.

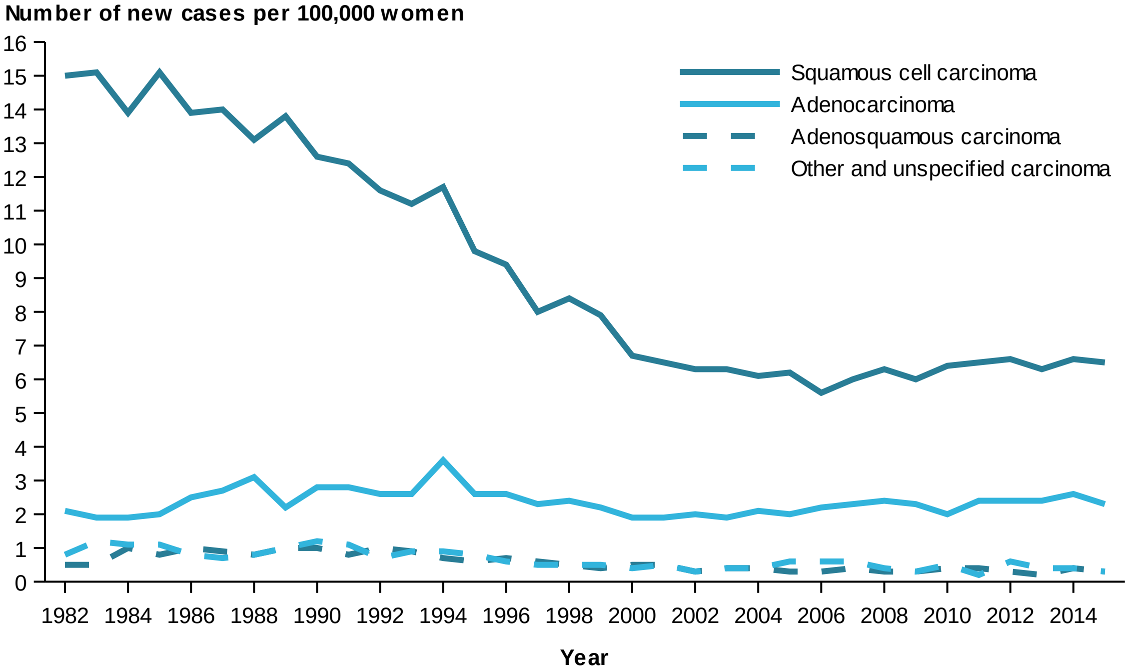
Source: AIHW Australian Cancer Database 2015.

In 2015, of the 727 cervical cancers diagnosed in women aged 20–69, 713 (98.1%) were carcinomas, 2 (0.3%) were sarcomas and 13 (1.8%) were classified as 'Other specified and unspecified malignant neoplasms' (Table 4.1).

Squamous cell carcinoma comprised the greatest proportion of all cervical carcinomas at 69.4%, followed by adenocarcinomas at 24.7% and adenosquamous carcinomas at 2.7%. 'Other specified and unspecified carcinomas' comprised 3.2% of all cervical carcinomas.

Trends in age-standardised incidence for women aged 20–69 for squamous cell carcinoma, adenocarcinoma, adenosquamous carcinoma and other carcinomas are shown in Figure 4.3.

Figure 4.3: Incidence of carcinoma of the cervix (squamous cell carcinoma, adenocarcinoma, adenosquamous carcinoma and other and unspecified carcinomas) in women aged 20–69, 1982 to 2015



Note: Data for 2015 are estimated for NSW.

Source: AIHW Australian Cancer Database 2015. Data for this figure are available in Table A6.3.

Squamous cell carcinoma has shown the most substantial change over this time. It decreased from 15.0 new cases per 100,000 women aged 20–69 in 1982 to 12.4 in 1991; thereafter, it halved to 6 new cases in 2002, where it remained until 2011, after which it began to rise slightly to around 6.5 new cases per 100,000 women.

In contrast, after an initial decrease from 2.8 new cases per 100,000 women in 1991, the incidence of adenocarcinoma has remained at around 2 new cases and was 2.3 new cases in 2015. The peak of 3.7 new cases per 100,000 women in 1994 is consistent with documented trends in Canada, the United States and the United Kingdom, and is thought to represent a cohort effect as a result of increased risk of adenocarcinoma for women born in the early 1960s (Blomfield & Saville 2008).

Incidence trends for adenosquamous and other carcinomas are more difficult to ascertain due to small numbers, both having an incidence of fewer than 1 new case per 100,000 women.

From these data, it is clear that the observed decrease in cervical cancer incidence since the introduction of the previous NCSP in 1991 does not apply equally to all histological types. The trend in squamous cell carcinomas illustrates the success of the previous NCSP in preventing these histological subtypes of cervical cancer by detecting high-grade squamous abnormalities, these being readily identified by repeated cervical cytology (Blomfield & Saville 2008). As a result, squamous cell carcinomas now comprise 68% of cervical cancers, much reduced from their historical proportion of 95% (Blomfield & Saville 2008).

In contrast, adenocarcinomas have not been reduced by cervical screening to the same degree. These glandular carcinomas now comprise 24% of all cervical cancers; previously this was proportionately a rarer disease. The inability of cervical screening to reduce glandular cancers below the level reached a decade ago is recognised as a reflection of the difficulties in sampling glandular cells (Sasieni et al. 2009): cervical cytology is less effective in identifying glandular abnormalities (Blomfield & Saville 2008). Further, the cytological interpretation of abnormal glandular cells that are sampled (which occur much less frequently than squamous abnormalities) is more difficult, and the progression from glandular abnormality to adenocarcinoma is not well characterised (Sasieni et al. 2009; Wang et al. 2006).

Some cervical cancers do not have a precancerous stage, and therefore cannot be detected by Pap tests, so their incidence has historically not been affected by cervical screening. These tend to be rare but aggressive cancers, such as neuroendocrine carcinoma of the cervix; the two most aggressive types are small cell neuroendocrine carcinoma and large cell neuroendocrine carcinoma, neither of which appears to possess a preinvasive stage (Necervix.com 2014).

Cervical cancer across areas

Incidence data are presented for 2010–2014 in this section as these are the most recent years for which actual data are available for all states and territories (see Appendix C for further information).

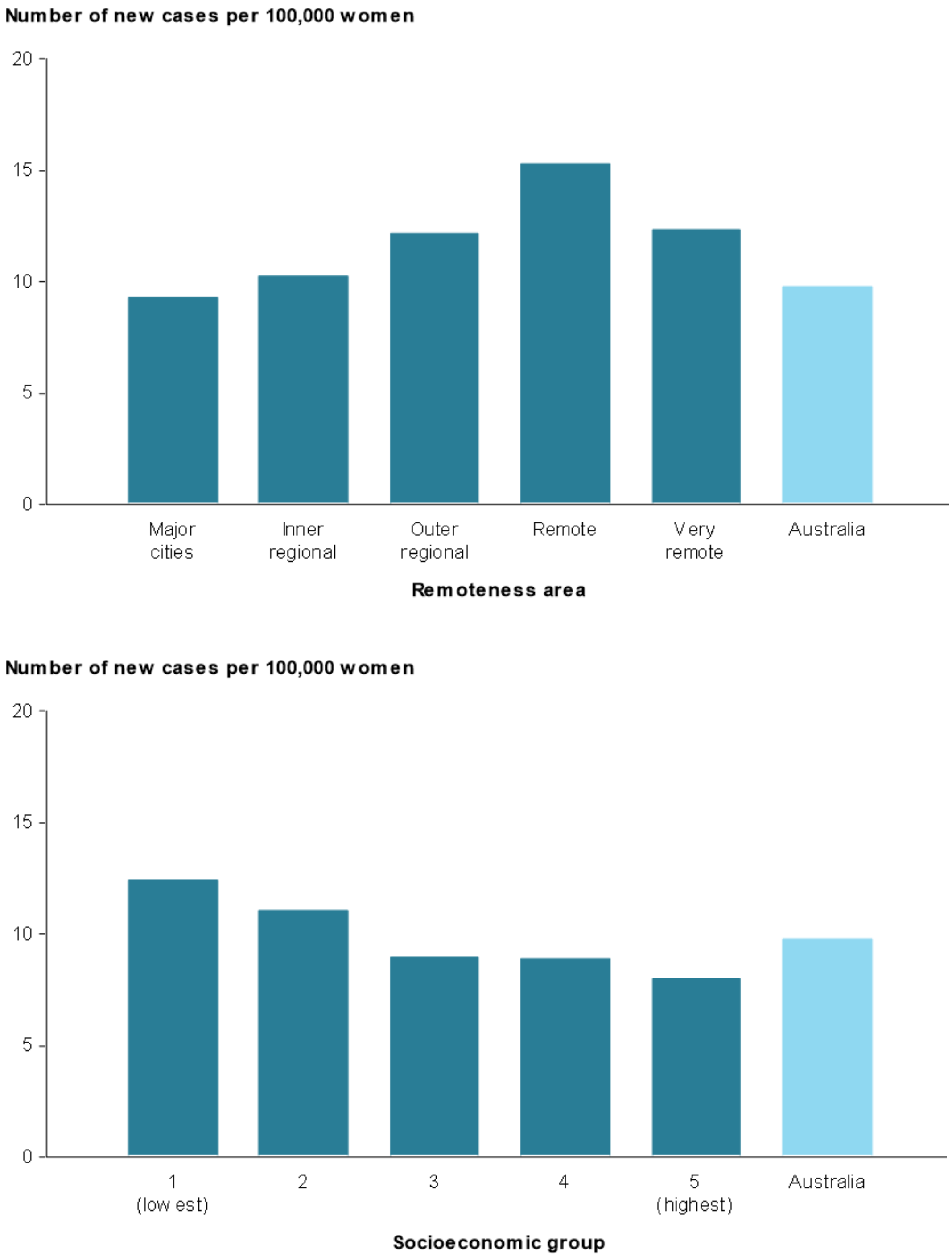
In 2010–2014, cervical cancer incidence increased with increasing remoteness and increasing socioeconomic disadvantage.

Incidence of cervical cancer in women aged 20–69 in 2010–2014 was similar for *Major cities* and *Inner regional* areas, being 9.3 and 10.3 new cases per 100,000 women, respectively. It was higher in *Outer regional* and *Very remote* areas at 12.2 and 12.1 new cases per 100,000 women, respectively. Incidence was highest in *Remote* areas at 15.3 new cases per 100,000 women (Figure 4.4).

In 2010–2014, cervical cancer incidence in women aged 20–69 was highest for women living in the lowest socioeconomic areas, at 12.4 new cases per 100,000 women; thereafter, it decreased with decreasing socioeconomic disadvantage and was lowest for women living in the highest socioeconomic areas, at 8.0 new cases per 100,000 women (Figure 4.4).

Cervical cancer incidence in 2009–2013, and cervical cancer mortality in 2011–2015 reported by small geographic areas, can be found on the AIHW website at http://www.aihw.gov.au/reports/cancer/cancer-incidence-mortality-small-geographic-areas/data.

Figure 4.4: Incidence of cervical cancer in women aged 20–69, by remoteness area and by socioeconomic group, 2010–2014



Note: Rates age-standardised to the Australian population as at 30 June 2001.

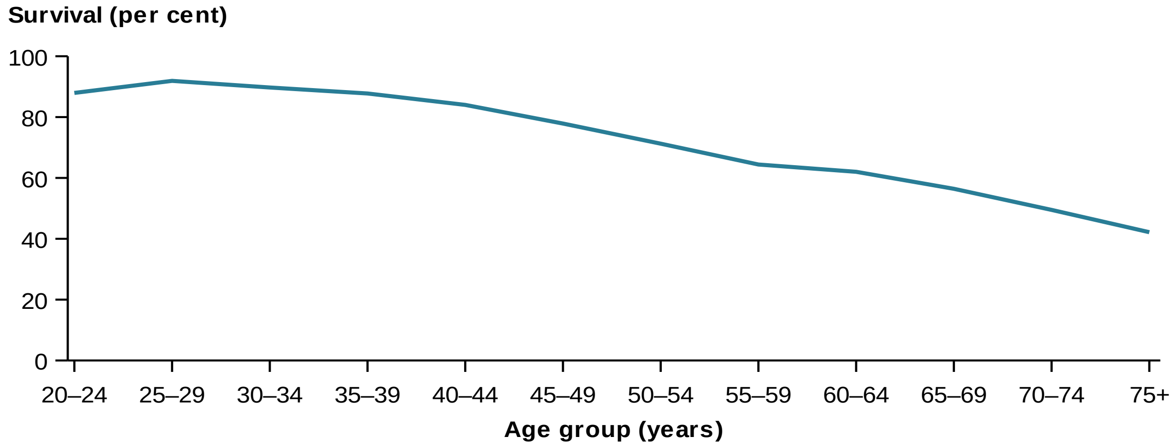
Source: AIHW Australian Cancer Database 2015. Data for this figure are available in tables A6.5 and A6.6.

4.2 Survival after a diagnosis of cervical cancer

Survival in this report refers to 'relative survival', which is the probability of being alive for a given amount of time after diagnosis compared with the general population, and reflects the impact of a cancer diagnosis. The source of survival data is the 2015 ACD which includes data from the National Death Index on deaths (from any cause) that occurred up to 31 December 2015, which were used to determine which people with cancer had died and when this occurred.

In 2011–2015, women diagnosed with cervical cancer in Australia had a 73.5% chance of surviving for 5 years compared with their counterparts in the general population. For the target age group 20–69, 5-year relative survival was 78.9%. Five-year survival from cervical cancer decreased with age; women aged 25–29 had the highest survival at 91.9%, whereas women aged 75 and over diagnosed with cervical cancer had less than a 50% chance of surviving for 5 years (Figure 4.5).

Figure 4.5: Five-year relative survival from cervical cancer, by age group, 2011–2015

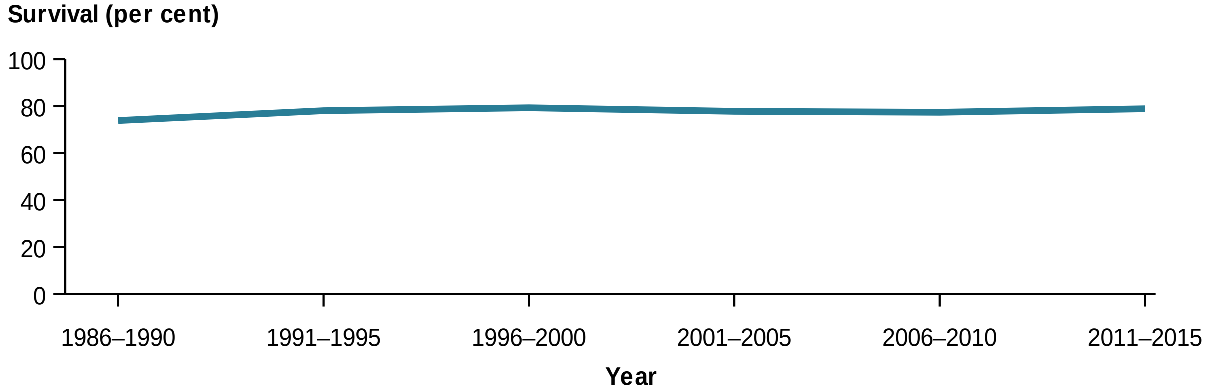


Note: This period does not contain incidence data for 2015 for NSW.

Source: AIHW Australian Cancer Database 2015. Data for this figure are available in Table A6.8.

Survival from cervical cancer has improved over time; between 1986–1990 and 2011–2015, the 5-year relative survival rate increased from 73.9% to 78.9% (Figure 4.6).

Figure 4.6: Trends in 5-year relative survival from cervical cancer in women aged 20–69, 1986–1990 to 2011–2015



Note: This period does not contain incidence data for 2015 for NSW.

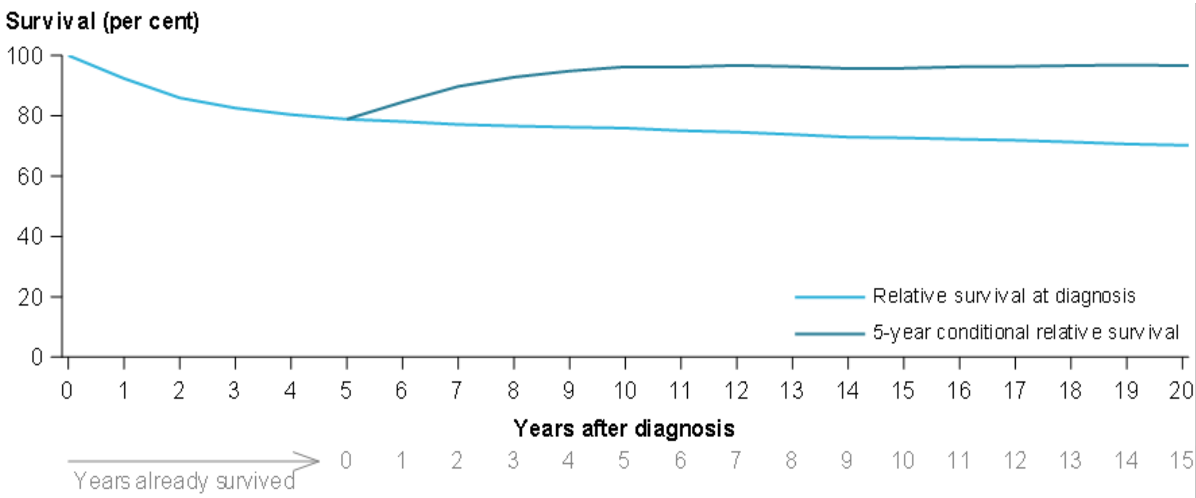
Source: AIHW Australian Cancer Database 2015. Data for this figure are available in Table A6.9.

Conditional survival is the probability of surviving a given number of years, provided that an individual has already survived a specified amount of time after diagnosis.

Conditional survival for cervical cancer for women aged 20–69 is illustrated in Figure 4.7. In this graph, the lighter blue line shows relative survival for each year after diagnosis (as shown by the numbers in black on the *x*-axis); the darker blue line shows relative survival for each year once an individual has already survived a certain number of years (as shown by the numbers in grey on the *x*-axis).

For cervical cancer, the prospect of surviving for at least 5 more years after having already survived for 5, 10 or 15 years was much higher than relative survival, at around 97% (Figure 4.7), indicating that if a woman survives for at least 5 years after diagnosis, her survival is almost the same as a woman not diagnosed with cervical cancer.

Figure 4.7: Relative survival at diagnosis and 5-year conditional survival from cervical cancer in women aged 20–69, 2011–2015



Note: This period does not contain incidence data for 2015 for NSW.

Source: AIHW Australian Cancer Database 2015. Data for this figure are available in Table A6.10.

4.3 Prevalence of cervical cancer

Prevalence is the number of people alive after a diagnosis of cancer. It is related to incidence and survival; if incidence and survival are both high, prevalence will be high, whereas if incidence and survival are both low, prevalence will be low.

The source of prevalence data is the 2015 ACD—which includes data from the National Death Index on deaths (from any cause) that occurred up to 31 December 2015, which were used to determine which people with cancer had died and when this occurred. Individuals who have been diagnosed with cancer and are still alive contribute to prevalence data.

At the end of 2014, there were 2,962 women aged 20–69 alive who had been diagnosed with cervical cancer in the previous 5 years and 5,104 who had been diagnosed in the previous 10 years (Table 4.2).

Table 4.2: Prevalence of cervical cancer, by age group, end of 2014

Age group	5-year prevalence	10-year prevalence
<20	3	4
20–24	22	22
25–29	215	235
30–34	421	551
35–39	431	728
40–44	489	882
45–49	371	719
50–54	363	700
55–59	257	513
60–64	216	410
65–69	176	343
70–74	130	247
75–79	100	207
80–84	56	111
85+	70	132
All ages	**3,320**	**5,804**
Ages 20–69 years	**2,962**	**5,104**

Note: 'Prevalence' refers to the number of living people previously diagnosed with cancer, not the number of cancer cases.

Source: AIHW Australian Cancer Database 2015.

4.4 Mortality from cervical cancer

Australia has high-quality and virtually complete mortality data. The mortality data used were provided by the registries of births, deaths and marriages and the National Coronial Information System, and coded by the ABS. These data are maintained at the AIHW in the National Mortality Database (NMD).

The latest national data available at the time of publication were for deaths in 2017. In this latest year, there were 230 deaths from cervical cancer in Australia. This is equivalent to 1.9 deaths for every 100,000 women in the population, which, when age-standardised to improve comparability over time and between population groups, equates to a rate of 1.6.

Of the 230 deaths, 140 occurred in women aged 20–69 (the target population of the previous NCSP). This is equivalent to 1.7 deaths per 100,000 women (and 1.7 age-standardised).

Box 4.2: Estimated mortality to 2019

Mortality data are also estimated to the current year of reporting. These estimates are based on Joinpoint analysis of 2007–2016 mortality data. Note that actual mortality data for 2018–2019 may differ from estimated data for these years, due to current and ongoing program or practice changes.

In 2019, it is estimated that there will be 262 deaths from cervical cancer, equivalent to 1.8 deaths for every 100,000 women in the population (age-standardised).

Of these 262 new cases, it is estimated that 170 will occur in women aged 20–69, equivalent to 1.9 deaths per 100,000 women (age-standardised).

Cervical cancer deaths over time

Similar to the trend for cervical cancer incidence, there was a modest decrease between 1982 and 1990 in age-standardised mortality from cervical cancer for women aged 20–69, from 5.5 to 4.8 deaths per 100,000 women; the greatest decrease followed the introduction of the previous NCSP in 1991. Mortality for women aged 20–69 fell to a historic low of 2 new cases per 100,000 women in 2002 (the same year that incidence plateaued) and has since remained steady at this level (Figure 4.8). This decrease in mortality has been accompanied by a decrease in the risk of death by age 85, from 1 in 165 in 1982, to 1 in 484 in 2016 (AIHW 2018a).

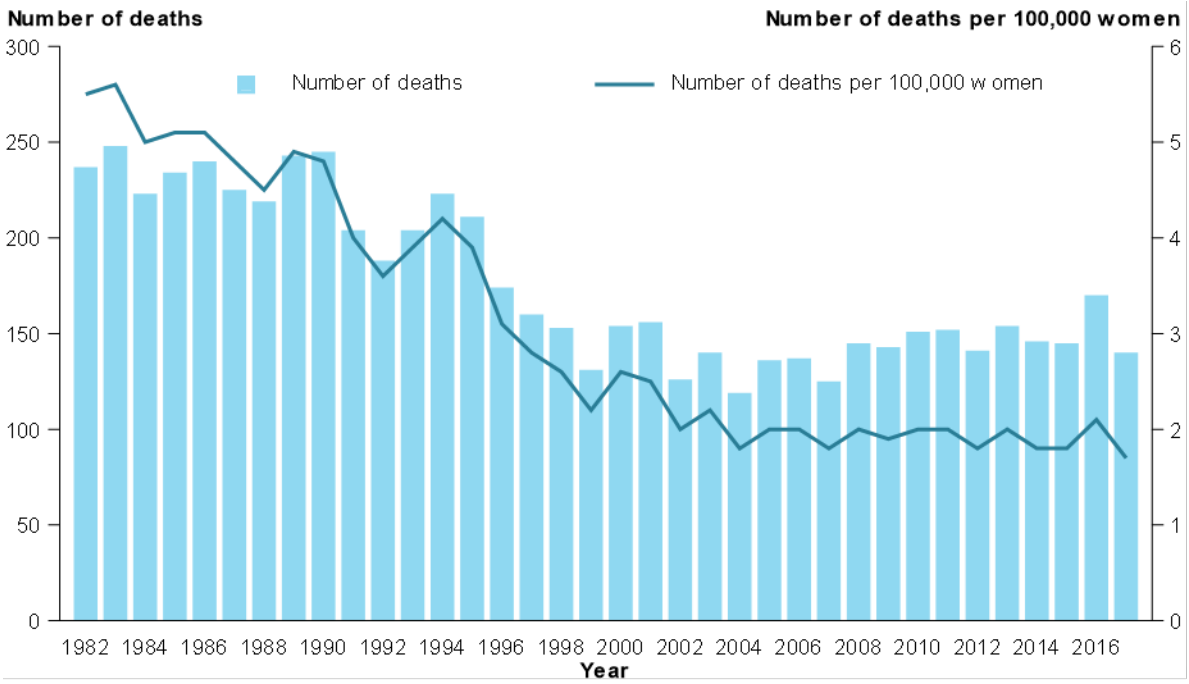
The large reduction in mortality occurred after the introduction of organised cervical screening in 1991, with the greatest reduction occurring in older women. This is most notable in the period 2002–2011, which did not have the small rise in mortality for women around age 65–69 that is apparent in both periods 1982–1991 and 1992–2001 (Figure 4.9).

Cervical cancer deaths across areas

Mortality in 2013–2017 was lowest in *Major cities* at 1.7 deaths per 100,000 women aged 20–69, followed by *Remote* areas at 1.8 and *Inner regional* areas at 2.0. It was slightly higher in *Outer regional* areas at 2.8 deaths per 100,000 women and highest in *Very remote* areas at 3.9 deaths per 100,000 women aged 20–69 (Figure 4.10).

In 2013–2017, mortality increased with increasing socioeconomic disadvantage, being highest for women living in the lowest socioeconomic areas, at 2.8 deaths per 100,000 women aged 20–69, and lowest for women living in the highest socioeconomic areas, at 1.0 deaths per 100,000 women aged 20–69 (Figure 4.10).

Figure 4.8: Mortality from cervical cancer in women aged 20–69, 1982 to 2017

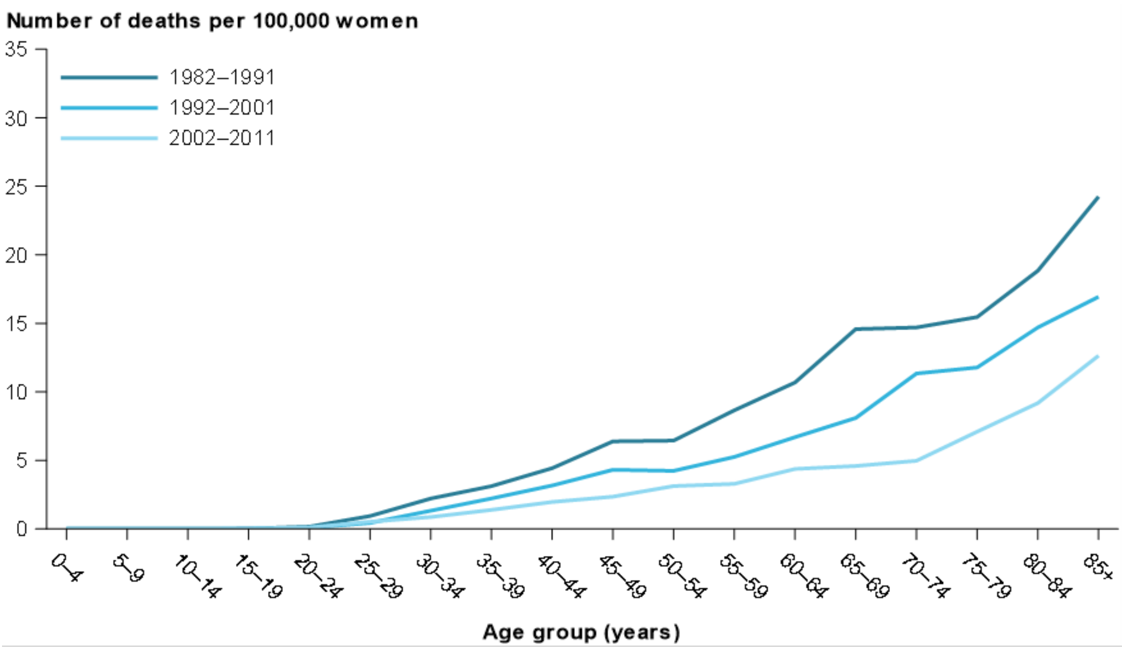


Notes

1. Deaths from 1982 to 2016 were derived by year of death; deaths in 2017 were derived by year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database. Data for this figure are available in Table A7.1.

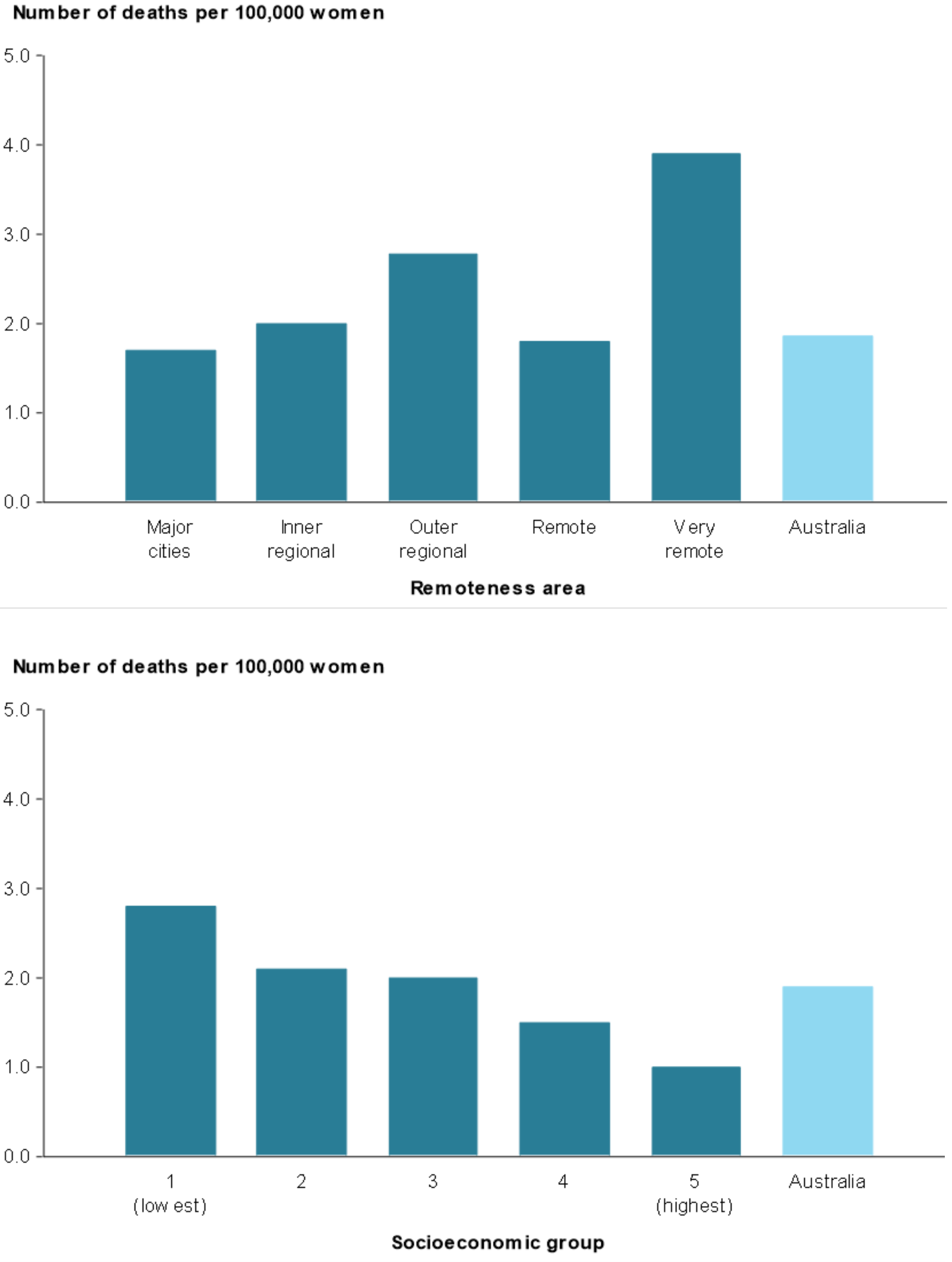
Figure 4.9: Mortality from cervical cancer by age group, 1982–1991, 1992–2001 and 2002–2011



Note: Deaths from 1982–2011 were derived by year of death and are based on the final version of cause of death data.

Source: AIHW National Mortality Database.

Figure 4.10: Mortality from cervical cancer in women aged 20–69, by remoteness area and by socioeconomic group, 2013–2017



Notes

1. Deaths from 2013–2016 were derived by year of death; deaths in 2017 were derived by year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database. Data for this figure are available in tables A7.4 and A7.5.

4.5 Burden of cervical cancer

'Burden of disease' refers to the quantified impact of a disease or injury on a population, using disability-adjusted life years (DALY). The DALY is used as a measure (in years) of healthy life lost, either through premature death, defined as 'dying before the ideal life span' (YLL), or, equivalently, through 'living with ill health due to illness or injury' (YLD).

Cancer is a major cause of illness in Australia: in 2011, cancer was the disease group accounting for the highest disease burden—19% of the total disease burden (AIHW 2016a). This section focuses on the burden of cervical cancer.

Cervical cancer was the 15th leading cause of cancer burden for females in 2011, with a DALY of 6,555, accounting for 1.8% of the total cancer burden for females (and the 25th leading cause for persons, at 0.8%) (AIHW 2017b).

Preliminary estimates for the fatal disease burden in 2015 (AIHW 2018c) are available; they indicate that cervical cancer was the 16th leading cause of fatal cancer burden in women in 2015, with 6,473 years of life lost (1.8% of the cancer burden).

Further, as it is a cancer experienced by relatively young women, cervical cancer causes considerable burden in these women (specifically among the age groups 15–24 and 25–64) (AIHW 2017b).

The rankings for cervical cancer according to the 3 measures that comprise burden of disease are shown in Table 4.3.

Table 4.3: Leading causes of cancer burden (DALY) 2011, leading causes of fatal cancer burden (YLL) 2011 and 2015, and leading causes of non-fatal cancer burden (YLD) 2011, females

	Rank	Cancer	Measure	%	AS rate
Leading causes of cancer burden (DALY) 2011	15	Cervical cancer	6,555	1.8	0.6
	. .	*All cancers*	*363,140*	*100.0*	*28.8*
Leading causes of fatal cancer burden (YLL) 2011	15	Cervical cancer	6,293	1.9	0.5
	. .	*All cancers*	*340,121*	*100.0*	*27.0*
Leading causes of fatal cancer burden (YLL) 2015	16	Cervical cancer	*6,473*	*1.8*	*0.5*
	. .	*All cancers*	*354,332*	*100.0*	*25.7*
Leading causes of non-fatal cancer burden (YLD) 2011	21	Cervical cancer	263	1.1	<0.1
	. .	*All cancers*	*23,019*	*100.0*	*1.8*

AS rate = age-standardised rate

Sources: AIHW 2017b, 2018c.

5 Cervical screening and cervical cancer outcomes in Indigenous women

Aboriginal and Torres Strait Islander women of Australia, hereafter respectfully referred to as Indigenous women, experience a high burden from cervical cancer compared with non-Indigenous women.

Among Indigenous women, cervical cancer ranks fourth highest in the leading causes of cancer burden, behind lung cancer, breast cancer and bowel cancer (AIHW 2017b). It is also the fifth most common cancer in Indigenous women (behind breast, lung, colorectal and uterus). The Indigenous/non-Indigenous rate ratio for cervical cancer is the third highest rate ratio of all the cancer types for all persons (AIHW 2016b).

Aspects of cervical cancer and cervical screening in Indigenous women are reported by the AIHW and others in various reports and publications; however, considering these data individually is not as valuable as considering all available data collectively. This chapter therefore aims to bring together the cervical screening participation, incidence and mortality data, as well as incorporating relevant data and findings from other published sources.

5.1 Cervical screening in Indigenous women

It has been recognised that Indigenous women face cultural, linguistic and physical barriers to cervical screening (DoHA 2004), and state and territory cervical screening programs have developed initiatives to increase participation in cervical screening by Indigenous women, with the Australian Government component of the NCSP supporting these through funding the development of principles, standards and guidelines for screening Aboriginal and Torres Strait Islander women (DoHA 2004).

To determine to what extent initiatives are achieving their desired aims, it is important that participation in cervical screening by Indigenous women be measured to provide an evidence base, both to benchmark current rates and to monitor changes over time. At the time of reporting, participation in cervical screening for Indigenous women cannot be measured nationally because Indigenous status is not included on all pathology forms in all states and territories, the only source of information for cervical screening registers. However, we can draw on some published data, and a growing body of evidence that indicates that Indigenous women are under-screened.

A decade ago, Coory and others (2002) and Binns & Condon (2006) estimated participation in cervical screening in communities with high proportions of Indigenous women in Queensland and the Northern Territory, respectively. Coory and others (2002) found that participation in 13 rural and remote Indigenous communities in Queensland was 41.1% (ranging between 19.9% and 63.5%), compared with a participation rate of 59.1% in the rest of Queensland. Binns & Condon (2006) reported that, in 2003–2004, Indigenous participation in the Northern Territory was 42.2% (ranging between 22.3% and 69.4%) with overall participation in the Northern Territory at 58.5% over those 2 years.

The rate of cervical screening in Indigenous women is also measured nationally for those women attending Indigenous specific primary health care services as part of the national key performance indicators (nKPIs) data collection (see Box 5.1), with the latest nKPI data indicating that 27% of regular female Indigenous clients had a cervical screening test in the previous 2 years as at December 2017; 35% had a cervical screening test in the previous 3 years; and 43% had a screening test in the previous 5 years (AIHW 2018d).

Box 5.1: National key performance indicators

The purpose of the nKPIs is to improve the delivery of primary health-care services by supporting continual quality improvement activity among service providers. The nKPIs also support policy and planning at the national and state and territory levels by monitoring progress and highlighting areas for improvement. Data for this collection are provided to the AIHW by primary health-care organisations, which receive funding from the Department of Health to provide services to Aboriginal and Torres Strait Islander people.

The nKPI data collection includes an indicator on women having a cervical screening test at 2-, 3- and 5-year intervals from primary health-care services providing care for Indigenous women. As this data set matures, it will become increasingly useful for understanding the extent of participation by Indigenous women attending these services.

Identification of Indigenous women in cervical screening data is the major impediment to the reporting of participation for Indigenous women. However, recent research, using data linkage to transfer Indigenous status from the Queensland Health Admitted Patient Data Collection to data from the Queensland Health Pap Smear Register, has provided new insights into participation of Indigenous women in cervical screening in Queensland.

In this study, 2-year participation was more than 20 percentage points lower for Indigenous women than for non-Indigenous women for all reporting periods examined from 2000–2001 to 2010–2011; in 2010–2011, 2-year participation was 33.5% for Indigenous women and 55.7% for non-Indigenous women (Whop et al. 2016).

Disparities such as this in participation in cervical screening are likely to have downstream effects on cancer incidence and mortality in Indigenous women. This is because cervical screening is able to detect precancerous abnormalities, thereby preventing cancers from developing, and reducing the incidence of malignant disease. Cancers that are detected are also more likely to be at an earlier stage, which tends to be associated with better survival, if they are treated. The cervical cancer outcomes of incidence and mortality in Indigenous women are explored in the next section.

5.2 Cervical cancer outcomes in Indigenous women

The source of national cancer incidence data in Australia is the ACD, which is compiled from data supplied by state and territory cancer registries. Like the state and territory cervical screening registers, the cancer registers rely on pathology forms as their primary source of information, which, as mentioned previously, do not include Indigenous status in all states and territories. Unlike the cervical screening registers, however, the cancer registers collect information from additional sources, such as hospital records and death records, which allows information on Indigenous status to be collected.

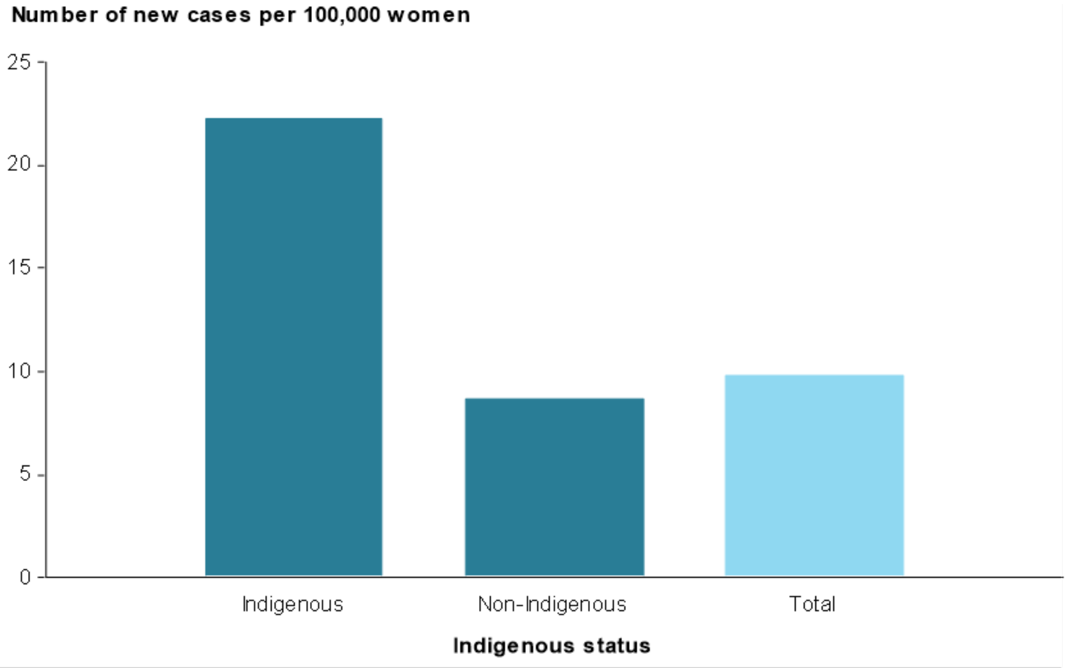
The level of identification of Indigenous Australians in cancer registry data is considered sufficient to enable analysis in 5 jurisdictions—New South Wales, Victoria, Queensland, Western Australia and the Northern Territory.

While the majority (89.9%) of Australian Indigenous people live in these 5 jurisdictions, the degree to which data for these jurisdictions are representative of data for all Indigenous people is unknown (ABS 2012). It is also unclear how many Indigenous Australians are misclassified as non-Indigenous, or how many people diagnosed with cancer whose Indigenous status is not known should be classified as Indigenous.

Analysis of data from these jurisdictions showed that, over the 5 years 2011–2015, 162 Indigenous women aged 20–69 were diagnosed with cervical cancer, equating to 20.0 new cases per 100,000 Indigenous women in the population.

This is a higher rate than experienced by non-Indigenous women—for women aged 20–69, the age-standardised incidence rate of 22.3 new cases per 100,000 for Indigenous women is more than twice that of non-Indigenous women, with an age-standardised incidence rate of 8.7 new cases per 100,000 women (Figure 5.1).

Figure 5.1: Incidence of cervical cancer in women aged 20–69 (New South Wales, Victoria, Queensland, Western Australia and the Northern Territory), by Indigenous status, 2011–2015



Note: Rates age-standardised to the Australian population as at 30 June 2001.

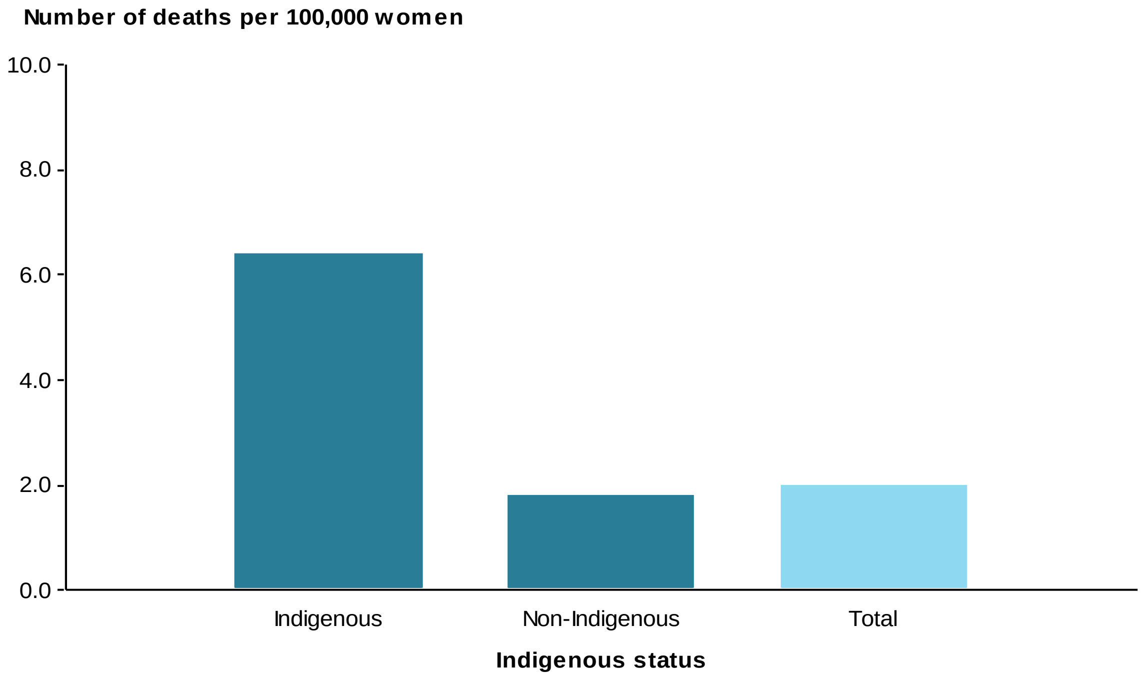
Source: AIHW Australian Cancer Database 2015. Data for this figure are available in Table A6.7.

The source of mortality data is the AIHW NMD, in which information on Indigenous status is considered to be adequate for reporting for 5 jurisdictions—New South Wales, Queensland, Western Australia, South Australia and the Northern Territory.

Over the 5 years 2013–2017, 46 Indigenous women aged 20–69 died from cervical cancer. This is 5.3 deaths per 100,000 Indigenous women.

Again, this is a higher rate than experienced by non-Indigenous women—the age-standardised mortality rate for women aged 20–69 of 6.4 deaths per 100,000 for Indigenous women is more than 3 times that for non-Indigenous women, with an age-standardised rate of 1.8 deaths new cases per 100,000 women (Figure 5.2).

Figure 5.2: Mortality from cervical cancer in women aged 20–69 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2013–2017



Notes

1. Deaths from 2013–2016 were derived from year of death; deaths in 2017 were derived from year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. Rates age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database. Data for this figure are available in Table A7.6.

Appendix A: Supporting data tables

A1 Participation

Table A1.1: Participation, by age, January 2016 – June 2017

	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69
Number	247,187	339,896	382,610	352,068	346,001	334,746	302,081	270,763	222,283	175,735
Crude rate	39.4	49.7	56.5	59.6	61.9	62.6	63.3	61.5	59.6	54.8

Notes

1. 'Crude rate' is the number of women screened in January 2016 – June 2017 as a percentage of the ABS estimated resident population for women aged 20–69, multiplied by 0.75 to account for the numerator being the number of women screened over 18 months instead of 24 months, and adjusted to include only women with an intact cervix using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database.
2. Data are for 1 January 2016 to 30 June 2017 only, and may not be comparable with previous data that were for 24 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A1.2: Participation by state and territory, women aged 20–69, January 2016 – June 2017

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number	951,090	779,718	568,759	318,928	211,960	60,816	52,801	29,298	2,973,370
Crude rate	56.5	56.8	54.0	57.4	58.4	56.2	57.3	53.2	56.3
AS rate	57.2	57.7	54.5	57.8	58.7	56.6	58.5	53.1	56.9

Notes

1. Direct comparisons between the states and territories of Australia are not advised, due to the substantial differences that exist between the jurisdictions, including population, area, geographical structure, policies and other factors.
2. 'Crude rate' is the number of women screened in January 2016 – June 2017 as a percentage of the ABS estimated resident population for women aged 20–69, multiplied by 0.75 to account for the numerator being the number of women screened over 18 months instead of 24 months, and adjusted to include only women with an intact cervix using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database; 'age-standardised (AS) rate' is the number of women in January 2016 – June 2017 as a percentage of the ABS estimated resident population for women aged 20–69, multiplied by 0.75 to account for the numerator being the number of women screened over 18 months instead of 24 months, and adjusted to include only women with an intact cervix using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database, age-standardised to the Australian population as at 30 June 2001.
3. Data are for 1 January 2016 to 30 June 2017 only, and may not be comparable with previous data that were for 24 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A1.3: Participation by remoteness area, women aged 20–69, 2015–2016

	Major cities	Inner regional	Outer regional	Remote	Very remote	Australia
Number	2,802,295	669,460	308,090	44,819	24,211	3,850,427
Crude rate	55.4	56.6	54.1	52.0	46.2	55.4
AS rate	56.4	56.6	54.2	52.1	46.3	56.0

Notes

1. Women were allocated to a remoteness area, using their residential postcode, according to the Australian Statistical Geography Standard for 2011. Caution is required when examining differences across remoteness areas (see Appendix D).
2. 'Australia' does not match the total, due to some women not being allocated to a remoteness area.
3. 'Crude rate' is the number of women screened in 2015–2016 as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix, using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database; 'age-standardised (AS) rate' is the number of women screened in 2015–2016 as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix, using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database, age-standardised to the Australian population as at 30 June 2001.

Source: AIHW analysis of state and territory cervical screening register data.

Table A1.4: Participation by socioeconomic group, women aged 20–69, 2015–2016

	1 (lowest)	2	3	4	5 (highest)	Australia
Number	647,373	705,381	776,850	816,870	886,553	3,850,427
Crude rate	49.8	53.1	54.2	56.6	61.7	55.4
AS rate	50.4	53.6	54.8	57.1	62.1	56.0

Notes

1. Women were allocated to a socioeconomic group, using their residential postcode, according to the Socio-Economic Indexes for Areas Index of Relative Socio-Economic Disadvantage for 2011. Caution is required when examining differences across socioeconomic groups (see Appendix D).
2. 'Australia' does not match the total, due to some women not being allocated to a socioeconomic group.
3. 'Crude rate' is the number of women screened in 2015–2016 as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix, using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database; 'age-standardised (AS) rate' is the number of women screened in 2015–2016 as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix, using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database, age-standardised to the Australian population as at 30 June 2001.

Source: AIHW analysis of state and territory cervical screening register data.

Table A1.5: Participation by age over 2 years (2015–2016), 3 years (2014–2016) and 5 years (2012–2016)

	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69
2 years, 2015–2016										
Number	327,949	437,283	485,946	448,606	457,466	428,464	398,564	350,070	288,605	227,474
Crude rate	39.7	48.6	55.2	58.5	60.3	61.7	62.4	60.9	59.3	54.2
3 years, 2014–2016										
Number	438,341	563,792	608,240	554,918	569,947	516,214	480,988	408,448	332,690	254,351
Crude rate	53.3	63.3	70.1	72.8	74.7	75.2	75.2	71.8	69.0	61.7
5 years, 2012–2016										
Number	605,478	722,782	729,451	666,755	669,519	588,493	536,525	436,870	353,073	250,371
Crude rate	74.3	82.8	86.9	88.1	87.7	86.8	84.4	78.5	74.7	63.1

Note: 'Crude rate' is the number of women screened as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix, using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database.

Source: AIHW analysis of state and territory cervical screening register data.

Table A1.6: Participation by state and territory over 3 years (2014–2016) and 5 years (2012–2016), women aged 20–69

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
3 years, 2014–2016									
Crude rate	68.0	70.5	66.3	68.4	70.8	69.1	69.5	67.2	68.6
AS rate	68.6	71.3	66.7	68.6	71.3	69.7	70.6	66.9	69.1
5 years, 2012–2016									
Crude rate	81.5	83.5	80.7	80.3	82.7	81.3	86.2	86.6	81.9
AS rate	81.9	83.9	80.9	80.2	83.3	82.4	86.5	85.2	82.2

Notes

1. Direct comparisons between the states and territories of Australia are not advised, due to substantial differences between the jurisdictions, including population, area, geographical structure, and policies.
2. 'Crude rate' is the number of women screened as a percentage of the ABS estimated resident population for women aged 20–69 adjusted to include only women with an intact cervix, using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database; 'age-standardised (AS) rate' is the number of women screened as a percentage of the ABS estimated resident population for women aged 20–69, adjusted to include only women with an intact cervix, using age-specific hysterectomy fractions derived from the AIHW National Hospitals Morbidity Database, age-standardised to the Australian population as at 30 June 2001.

Source: AIHW analysis of state and territory cervical screening register data.

A2 Rescreening

Table A2.1: Number and proportion of women aged 20–69 rescreening early following a negative cervical cytology test, by number of early rescreens, 2015 cohort

Number of early rescreens	Number of women	% of women
0	144,442	89.6
1	16,394	10.2
2	390	0.2
3	47	0.0
4	3	0.0
5+	0	0.0

Note: Women with a cytological or histological abnormality in the preceding 36 months are excluded from the cohort; repeat cytology tests that are a valid repeat of an unsatisfactory cytology test are excluded from this count.

Source: AIHW analysis of state and territory cervical screening register data.

Table A2.2: Proportion of women aged 20–69 rescreening early following a negative cervical cytology test, by state and territory, 2015 cohort

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
%	11.1	10.1	10.9	10.1	9.1	8.4	8.7	8.4	10.4

Source: AIHW analysis of state and territory cervical screening register data.

Table A2.3: Women aged 20–69 rescreening within 3 months of receiving a 27-month cervical screening register reminder letter, by state and territory, letters sent in 2016

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
No. sent letter	329,388	238,027	223,265	106,202	68,097	23,150	20,226	12,004	1,020,359
No. rescreened	107,526	73,439	71,008	30,501	21,315	8,533	5,677	1,920	319,919
%	32.6	30.9	31.8	28.7	31.3	36.9	28.1	16.0	31.4

Source: AIHW analysis of state and territory cervical screening register data.

A3 Cytology

Table A3.1: Number of cytology tests, by age, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
<20	56,159	53,323	51,549	46,619	42,980	40,046	18,242
20–24	195,602	195,502	196,907	193,395	188,629	181,526	87,049
25–29	247,362	251,896	257,726	253,606	249,201	245,364	120,642
30–34	253,185	260,357	271,579	273,033	271,906	273,968	135,688
35–39	260,198	256,294	259,395	251,497	247,411	252,247	125,585
40–44	252,666	261,413	270,965	261,565	254,969	248,547	120,188
45–49	235,860	235,597	238,943	233,683	231,916	237,583	117,892
50–54	211,883	218,708	225,342	221,968	217,630	215,270	104,101
55–59	172,415	179,296	184,872	186,502	186,786	190,401	94,195
60–64	144,153	146,935	151,208	151,721	152,538	154,742	77,323
65–69	92,294	102,229	109,584	114,728	118,724	122,511	60,322
70+	28,014	28,402	29,752	29,898	31,075	32,911	17,617
All ages	**2,149,798**	**2,189,960**	**2,247,835**	**2,218,227**	**2,193,768**	**2,195,121**	**1,078,846**
Ages 20–69	**2,065,618**	**2,108,227**	**2,166,521**	**2,141,698**	**2,119,710**	**2,122,159**	**1,042,985**

Notes

1. 'All ages' may not equal the sum of the age groups, due to the inclusion of women for whom the age group was not stated.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.2: Proportion of cytology tests, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Crude rate	1.7	8.1	11.2	12.6	11.6	11.1	10.9	9.6	8.7	7.2	5.6	1.6

Notes

1. 'Crude rate' is the number of cytology tests as a proportion of the total number of cytology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.3: Unsatisfactory cytology tests in women aged 20–69, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
Number	42,760	46,192	48,148	49,422	54,379	52,979	26,179
Crude rate	2.1	2.2	2.2	2.3	2.6	2.5	2.5
AS rate	2.1	2.2	2.2	2.3	2.6	2.5	2.5

Notes

1. 'Crude rate' is the number of unsatisfactory cytology tests as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of unsatisfactory cytology tests as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.4: Unsatisfactory cytology tests, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	527	2,305	3,203	3,406	2,946	2,664	2,581	2,466	2,705	2,292	1,611	572
Crude rate	2.9	2.6	2.7	2.5	2.3	2.2	2.2	2.4	2.9	3.0	2.7	3.2

Notes

1. 'Crude rate' is the number of unsatisfactory cytology tests as a proportion of the total number of cytology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.5: Unsatisfactory cytology tests in women aged 20–69, by state and territory, January–June 2017

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number	8,461	7,978	4,227	2,553	1,862	545	416	137	26,179
Crude rate	2.5	2.9	2.1	2.3	2.5	2.6	2.2	1.4	2.5
AS rate	2.5	2.9	2.1	2.2	2.4	2.5	2.2	1.4	2.5

Notes

1. 'Crude rate' is the number of unsatisfactory cytology tests as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of unsatisfactory cytology tests as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.6: Negative cytology tests in women aged 20–69, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
Number	1,908,291	1,943,563	1,992,544	1,970,963	1,948,641	1,958,353	960,080
Crude rate	92.4	92.2	92.0	92.0	91.9	92.3	92.1
AS rate	92.3	92.1	91.9	91.9	91.8	92.1	91.9

Notes

1. 'Crude rate' is the number of negative cytology tests as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of negative cytology tests as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.7: Negative cytology tests, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	15,564	74,344	106,108	122,971	115,640	111,687	110,375	98,294	89,306	73,629	57,726	16,600
Crude rate	85.3	85.4	88.0	90.6	92.1	92.9	93.6	94.4	94.8	95.2	95.7	94.2

Notes

1. 'Crude rate' is the number of negative cytology tests as a proportion of the total number of cytology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.8: Negative cytology tests in women aged 20–69, by state and territory, January–June 2017

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number	306,897	248,807	186,055	102,608	70,050	19,241	17,321	9,101	960,080
Crude rate	92.2	91.2	93.3	90.6	93.5	92.4	92.8	89.8	92.1
AS rate	92.0	90.9	93.2	90.7	93.3	92.2	92.8	90.2	91.9

Notes

1. 'Crude rate' is the number of negative cytology tests as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of negative cytology tests as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.9: Cytology tests with no endocervical component in women aged 20–69, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
Number	440,411	461,425	487,633	492,683	496,146	508,758	273,665
Crude rate	21.3	21.9	22.5	23.0	23.4	24.0	26.2
AS rate	21.4	21.9	22.5	22.9	23.3	23.8	26.1

Notes

1. 'Crude rate' is the number of cytology tests with no endocervical component as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of cytology tests with no endocervical component as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.10: Cytology tests with no endocervical component, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	4,090	19,180	26,599	29,165	27,618	28,780	31,604	30,537	30,047	27,191	22,944	7,302
Crude rate	22.4	22.0	22.0	21.5	22.0	23.9	26.8	29.3	31.9	35.2	38.0	41.4

Notes

1. 'Crude rate' is the number of cytology tests with no endocervical component as a proportion of the total number of cytology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.11: Cytology tests with no endocervical component in women aged 20–69, by state and territory, January–June 2017

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number	76,804	84,309	42,851	33,881	20,451	7,711	4,445	3,213	273,665
Crude rate	23.1	30.9	21.5	29.9	27.3	37.0	23.8	31.7	26.2
AS rate	22.9	30.6	21.4	30.2	26.7	36.4	24.0	32.8	26.1

Notes

1. 'Crude rate' is the number of cytology tests with no endocervical component as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of cytology tests with no endocervical component as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.12: Abnormalities detected by cytology in women aged 20–69, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
Low-grade abnormalities							
Number	84,540	88,845	95,804	92,439	89,254	85,282	44,119
Crude rate	4.1	4.3	4.4	4.3	4.2	4.0	4.2
AS rate	4.1	4.3	4.5	4.4	4.3	4.2	4.4
High-grade abnormalities							
Number	30,253	29,875	30,320	29,187	27,653	25,736	12,661
Crude rate	1.5	1.4	1.4	1.4	1.3	1.2	1.2
AS rate	1.5	1.4	1.4	1.4	1.3	1.2	1.2
All abnormalities (low-grade, high-grade and cancer)							
Number	115,026	118,953	126,344	121,855	117,115	111,253	56,891
Crude rate	5.6	5.8	5.8	5.7	5.5	5.2	5.5
AS rate	5.6	5.8	5.9	5.8	5.6	5.4	5.6

Notes

1. 'Low-grade abnormalities' are cytology test results S2, S3 and E2; 'high-grade abnormalities' are cytology results S4, S5, S6, E3, E4 and E5. 'All abnormalities' are cytology results S2, S3, S4, S5, S6, S7, E2, E3, E4, E5 and E6 (see Table 3.2).
2. 'Crude rate' is the number of abnormalities (low-grade, high-grade or all) detected by cytology as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of abnormalities (low-grade, high-grade or all) detected by cytology as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
3. 'Abnormalities' refers to the number of abnormalities detected, not the number of abnormal cytology tests; in a small proportion of cytology tests, there may be more than one abnormality detected, each of which will be counted.
4. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.13: Low-grade abnormalities detected by cytology, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	1,951	8,856	8,507	6,610	5,240	4,584	4,044	2,704	1,729	1,099	746	307
Crude rate	10.7	10.2	7.1	4.9	4.2	3.8	3.4	2.6	1.8	1.4	1.2	1.7

Notes

1. 'Crude rate' is the number of low-grade abnormalities detected by cytology as a proportion of the total number of cytology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.14: High-grade abnormalities detected by cytology, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	200	1,548	2,851	2,732	1,781	1,249	902	636	450	292	220	104
Crude rate	1.1	1.8	2.4	2.0	1.4	1.0	0.8	0.6	0.5	0.4	0.4	0.6

Notes

1. 'Crude rate' is the number of high-grade abnormalities detected by cytology as a proportion of the total number of cytology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.15: Squamous abnormalities detected by cytology in women aged 20–69, by squamous category, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
S2 Possible low-grade squamous intraepithelial lesion							
Number	49,443	52,007	57,748	54,672	53,544	50,251	25,597
% of cytology tests	2.4	2.5	2.7	2.6	2.5	2.4	2.5
% of squamous abnormalities	43.6	44.4	46.4	45.5	46.3	45.8	45.6
S3 Low-grade squamous intraepithelial lesion							
Number	34,276	36,047	37,136	36,889	34,979	34,272	18,161
% of cytology tests	1.7	1.7	1.7	1.7	1.7	1.6	1.7
% of squamous abnormalities	30.2	30.7	29.8	30.7	30.3	31.2	32.4
S4 Possible high-grade squamous intraepithelial lesion							
Number	13,020	12,848	13,334	12,705	12,927	12,317	6,086
% of cytology tests	0.6	0.6	0.6	0.6	0.6	0.6	0.6
% of squamous abnormalities	11.5	11.0	10.7	10.6	11.2	11.2	10.8
S5 High-grade squamous intraepithelial lesion							
Number	16,117	15,863	15,791	15,292	13,644	12,386	6,043
% of cytology tests	0.8	0.8	0.7	0.7	0.6	0.6	0.6
% of squamous abnormalities	14.2	13.5	12.7	12.7	11.8	11.3	10.8
S6 High-grade squamous intraepithelial lesion with possible microinvasion/invasion							
Number	310	346	317	335	325	328	161
% of cytology tests	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% of squamous abnormalities	0.3	0.3	0.3	0.3	0.3	0.3	0.3
S7 Squamous cell carcinoma							
Number	155	153	142	139	135	166	79
% of cytology tests	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% of squamous abnormalities	0.1	0.1	0.1	0.1	0.1	0.2	0.1
All squamous abnormalities							
Number	113,321	117,264	124,468	120,032	115,554	109,720	56,127
Crude rate	5.5	5.6	5.7	5.6	5.5	5.2	5.4
AS rate	5.5	5.3	5.8	5.7	5.6	5.3	5.6

Notes

1. 'Crude rate' is the number of abnormalities, for each category of squamous abnormality or for all squamous abnormalities combined, detected by cytology, as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of all squamous abnormalities combined, detected by cytology, as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A3.16: Endocervical abnormalities detected by cytology in women aged 20–69, by endocervical category, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
E2 Atypical endocervical cells of uncertain significance							
Number	821	791	920	878	731	759	361
% of cytology tests	0.04	0.04	0.04	0.04	0.03	0.04	0.03
% of endocervical abnormalities	48.2	46.8	49.0	48.2	46.8	49.5	47.3
E3 Possible high-grade endocervical glandular lesion							
Number	500	531	540	542	470	446	207
% of cytology tests	0.02	0.03	0.02	0.03	0.02	0.02	0.02
% of endocervical abnormalities	29.3	31.4	28.8	29.7	30.1	29.1	27.1
E4 Adenocarcinoma in situ							
Number	283	266	307	289	269	243	154
% of cytology tests	0.01	0.01	0.01	0.01	0.01	0.01	0.01
% of endocervical abnormalities	16.6	15.7	16.4	15.9	17.2	15.9	20.2
E5 Adenocarcinoma in situ with possible microinvasion/invasion							
Number	23	21	31	24	18	16	10
% of cytology tests	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% of endocervical abnormalities	1.3	1.2	1.7	1.3	1.2	1.0	1.3
E6 Adenocarcinoma							
Number	78	80	78	90	73	69	32
% of cytology tests	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% of endocervical abnormalities	4.6	4.7	4.2	4.9	4.7	4.5	4.2
All endocervical abnormalities							
Number	1,705	1,689	1,876	1,823	1,561	1,533	764
Crude rate	0.08	0.08	0.09	0.09	0.07	0.07	0.07
AS rate	0.08	0.08	0.09	0.08	0.07	0.07	0.07

Notes

1. 'Crude rate' is the number of abnormalities, for each category of endocervical abnormality or for all endocervical abnormalities combined, detected by cytology, as a proportion of the total number of cytology tests; 'age-standardised (AS) rate' is the number of all endocervical abnormalities combined, detected by cytology, as a proportion of the total number of cytology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

A4 Histology

Table A4.1: Number of histology tests, by age, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
<20	1,380	1,257	1,177	991	842	783	312
20–24	10,089	9,636	9,229	8,631	7,936	7,272	3,213
25–29	12,940	13,517	14,097	13,380	12,963	11,909	5,384
30–34	10,635	10,908	11,752	12,117	11,867	11,646	5,541
35–39	9,259	9,703	9,885	9,937	9,912	10,279	4,657
40–44	9,218	9,920	10,637	10,954	10,781	10,644	5,014
45–49	8,681	8,985	9,657	9,758	9,934	10,521	4,896
50–54	6,259	6,637	7,105	7,471	7,317	7,371	3,484
55–59	3,892	4,041	4,441	4,654	4,550	4,775	2,318
60–64	2,802	2,964	3,135	3,313	3,191	3,328	1,552
65–69	1,814	2,018	2,220	2,417	2,503	2,534	1,246
70+	2,057	2,154	2,300	2,200	2,417	2,534	1,319
All ages	**79,026**	**81,740**	**85,636**	**85,823**	**84,214**	**83,596**	**38,937**
Ages 20–69	**75,589**	**78,329**	**82,158**	**82,632**	**80,954**	**80,279**	**37,305**

Notes

1. 'All ages' may not equal the sum of the age groups, due to the inclusion of women for whom the age group was not stated.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.2: Proportion of histology tests, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Crude rate	0.8	8.3	13.8	14.2	12.0	12.9	12.6	8.9	6.0	4.0	3.2	3.4

Notes

1. 'Crude rate' is the number of histology tests as a proportion of the total number of histology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.3: Histology tests as a proportion of cytology tests, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Crude rate	1.7	3.7	4.5	4.1	3.7	4.2	4.2	3.3	2.5	2.0	2.1	7.5

Notes

1. 'Crude rate' is the number of histology tests as a proportion of the number of cytology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.4: Negative histology tests, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	127	1,024	1,706	2,016	2,224	3,193	3,593	2,715	1,782	1,193	978	1,091
Crude rate	40.7	31.9	31.7	36.4	47.8	63.7	73.4	77.9	76.9	76.9	78.5	82.7

Notes

1. ‘Crude rate’ is the number of negative histology tests as a proportion of the total number of histology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.5: Abnormalities detected by histology in women aged 20–69, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
Low-grade abnormalities							
Number	14,566	14,856	15,318	15,165	15,049	14,782	6,536
Crude rate	19.3	19.0	18.6	18.4	18.6	18.4	17.5
AS rate	17.4	17.2	17.1	17.2	17.6	17.6	16.9
High-grade abnormalities							
Number	22,676	23,149	23,734	22,947	22,021	20,562	9,135
Crude rate	30.0	29.6	28.9	27.8	27.2	25.6	24.5
AS rate	25.9	25.7	25.4	24.8	24.5	23.5	22.7
All abnormalities (low-grade, high-grade and cancer)							
Number	38,122	38,984	40,038	39,109	37,968	36,304	16,142
Crude rate	50.4	49.8	48.7	47.3	46.9	45.2	43.3
AS rate	44.6	44.4	44.0	43.3	43.3	42.4	40.9

Notes

1. ‘Low-grade abnormalities’ are histology test results HS02 and HE02; ‘high-grade abnormalities’ are histology results HS03 and HE03. ‘All abnormalities’ are histology test results HS02, HS03, HS04, HE02, HE03 and HE04 (see Table 3.6).
2. ‘Crude rate’ is the number of abnormalities (low-grade, high-grade or all), detected by histology, as a proportion of the total number of histology tests; ‘age-standardised (AS) rate’ is the number of abnormalities (low-grade, high-grade or all), detected by histology, as a proportion of the total number of histology tests, age-standardised to the Australian population as at 30 June 2001.
3. ‘Abnormalities’ refers to the number of abnormalities detected, not the number of abnormal histology tests; in a small proportion of histology tests there may be more than one abnormality detected, each of which will be counted.
4. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.6: Low-grade abnormalities detected by histology, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	99	1,079	1,437	1,128	852	733	570	338	208	118	73	36
Crude rate	31.7	33.6	26.7	20.4	18.3	14.6	11.6	9.7	9.0	7.6	5.9	2.7

Notes

1. ‘Crude rate’ is the number low-grade abnormalities detected by histology as a proportion of the total number of histology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.7: High-grade abnormalities detected by histology, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Number	84	1,051	2,150	2,268	1,474	929	577	273	198	127	88	35
Crude rate	26.9	32.7	39.9	40.9	31.7	18.5	11.8	7.8	8.5	8.2	7.1	2.7

Notes

1. 'Crude rate' is the number of high-grade abnormalities detected by histology as a proportion of the total number of histology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.8: High-grade abnormality detection rate, by age, 2004–2006 to January–June 2017

	2004–2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	January–June 2017
<20	13.6	11.6	10.8	8.9	7.8	7.1	6.4	5.7	5.0	4.1	3.9	3.9
20–24	20.1	18.9	21.3	19.9	19.7	17.4	15.8	15.0	12.9	11.8	10.6	10.0
25–29	17.7	17.8	19.3	19.0	19.9	19.4	20.0	20.3	18.5	17.7	15.9	14.4
30–34	11.6	11.5	12.7	12.8	13.6	14.0	13.8	14.5	14.1	13.5	12.6	12.9
35–39	7.1	7.3	7.8	7.6	8.3	9.0	9.2	9.4	9.3	9.4	9.5	9.1
40–44	4.6	4.7	4.8	4.7	4.9	5.5	6.0	6.3	6.4	6.3	6.5	6.2
45–49	3.1	3.2	3.3	3.3	3.5	3.8	3.7	4.0	4.0	4.2	4.3	4.0
50–54	1.8	1.9	2.0	1.9	2.1	2.2	2.4	2.4	2.4	2.6	2.4	2.2
55–59	1.5	1.4	1.3	1.3	1.7	1.7	1.6	1.6	1.9	1.6	1.6	1.8
60–64	1.3	1.2	1.3	1.2	1.2	1.4	1.5	1.4	1.7	1.5	1.5	1.4
65–69	1.2	1.3	1.3	1.1	1.1	1.1	1.1	1.4	1.0	1.3	1.1	1.2
70+	3.0	2.4	2.6	2.6	3.4	2.7	2.8	2.6	2.4	3.2	2.7	1.6
Ages 20–69												
Number	. .	15,671	16,457	16,257	16,291	16,641	16,808	17,609	16,505	15,838	14,731	7,105
Crude rate	7.9	7.8	8.4	8.1	8.4	8.4	8.3	8.5	8.0	7.7	7.3	7.0
AS rate	7.7	7.7	8.3	8.1	8.5	8.4	8.4	8.5	8.1	7.8	7.4	7.1

Notes

1. 'Crude rate' is the number of women with a high-grade abnormality detected by histology per 1,000 women screened; 'age-standardised (AS) rate' is the number of women with a high-grade abnormality detected by histology per 1,000 women screened, age-standardised to the Australian population as at 30 June 2001.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.9: High-grade abnormality detection rate in women aged 20–69, by state and territory, January–June 2017

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number	2,387	1,736	1,188	919	444	169	128	134	7,105
Crude rate	7.3	6.6	6.0	8.2	6.0	8.3	6.9	13.4	7.0
AS rate	7.4	6.9	6.0	7.9	6.3	8.8	6.8	11.8	7.1

Notes

1. 'Crude rate' is the number of women with a high-grade abnormality detected by histology per 1,000 women screened; 'age-standardised (AS) rate' is the number of women with a high-grade abnormality detected by histology per 1,000 women screened, age-standardised to the Australian population as at 30 June 2001.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.10: Squamous abnormalities detected by histology in women aged 20–69, by squamous category, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
HS02 Low-grade squamous abnormality							
Number	14,504	14,802	15,269	15,127	15,017	14,757	6,522
% of histology tests	19.2	18.9	18.6	18.3	18.6	18.4	41.7
% of squamous abnormalities	39.2	39.2	39.3	39.9	40.7	41.8	17.5
HS03 High-grade squamous abnormality							
Number	21,941	22,365	22,946	22,139	21,296	19,856	8,822
% of histology tests	29.0	28.6	27.9	26.8	26.3	24.7	56.4
% of squamous abnormalities	59.3	59.2	59.0	58.4	57.7	56.3	23.6
HS04 Squamous cell carcinoma							
Number	551	641	651	631	597	662	309
% of histology tests	0.7	0.8	0.8	0.8	0.7	0.8	2.0
% of squamous abnormalities	1.5	1.7	1.7	1.7	1.6	1.9	0.8
All squamous abnormalities							
Number	36,996	37,808	38,866	37,897	36,910	35,275	15,653
Crude rate	48.9	48.3	47.3	45.9	45.6	43.9	42.0
AS rate	43.1	42.9	42.6	41.9	42.0	41.2	39.7

Notes

1. 'HS03 High-grade squamous abnormality' combines cervical intraepithelial neoplasia (CIN) not otherwise specified (NOS), CIN II and CIN III.
2. 'Crude rate' is the number of squamous abnormalities, for each category of squamous abnormality or for all squamous abnormalities combined, detected by histology, as a proportion of the total number of histology tests; 'age-standardised (AS) rate' is the number of all squamous abnormalities combined, detected by histology, as a proportion of the total number of histology tests, age-standardised to the Australian population as at 30 June 2001.
3. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.11: CIN II and CIN III in women aged 20–69, 2011 to January–June 2017

	2011	2012	2013	2014	2015	2016	January–June 2017
HS03.2 CIN II							
Number	4,157	4,236	4,293	3,951	3,856	3,666	1,689
% of histology tests (crude rate)	11.2	10.8	10.5	9.6	9.4	9.0	8.5
% of histology tests (AS rate)	9.6	9.5	9.3	8.7	8.6	8.5	8.1
% of squamous abnormalities	25.5	25.0	24.9	23.8	23.4	23.3	22.6
HS03.3 CIN III							
Number	5,293	5,868	5,896	5,806	5,680	5,292	2,487
% of histology tests (crude rate)	14.2	15.0	14.4	14.0	13.8	13.0	12.5
% of histology tests (AS rate)	12.4	13.2	12.8	12.7	12.6	12.1	11.6
% of squamous abnormalities	32.4	34.7	34.2	34.9	34.4	33.7	33.3

Notes

1. 'Crude rate' is the number of CIN II or CIN III abnormalities detected by histology, as a proportion of the total number of histology tests; 'age-standardised (AS) rate' is the number of CIN II or CIN III abnormalities detected by histology as a proportion of the total number of histology tests, age-standardised to the Australian population as at 30 June 2001.
2. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.12: CIN II and CIN III, by age, January–June 2017

	<20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
CIN II												
Number	25	299	433	368	238	139	99	53	33	16	11	3
Crude rate	16.8	17.7	15.2	12.8	9.9	5.1	3.6	2.7	2.7	1.9	1.6	0.4
CIN III												
Number	12	205	581	658	399	283	161	74	61	31	34	14
Crude rate	8.1	12.2	20.5	22.9	16.5	10.3	5.9	3.8	5.0	3.8	5.0	2.0

Notes

1. 'Crude rate' is the number of high-grade abnormalities detected by histology as a proportion of the total number of histology tests.
2. Data are for 1 January 2017 to 30 June 2017 only, and may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

Table A4.13: Endocervical abnormalities detected by histology in women aged 20–69, by endocervical category, 2011 to January–June 2017

Endocervical category	2011	2012	2013	2014	2015	2016	January–June 2017
HE02 Endocervical atypia							
Number	62	54	49	38	32	25	14
% of histology tests	0.08	0.07	0.06	0.05	0.04	0.03	0.04
% of endocervical abnormalities	5.5	4.6	4.2	3.1	3.0	2.4	2.9
HE03 High-grade endocervical abnormality							
Number	735	784	788	808	725	706	313
% of histology tests	0.97	1.00	0.96	0.98	0.90	0.88	0.84
% of endocervical abnormalities	65.3	66.7	67.2	66.7	68.5	68.6	64.0
HE04.1 and HE04.2 Adenocarcinoma							
Number	283	284	275	296	257	272	141
% of histology tests	0.37	0.36	0.33	0.36	0.32	0.34	0.38
% of endocervical abnormalities	25.1	24.1	23.5	24.4	24.3	26.4	28.8
HE04.3 Adenosquamous carcinoma							
Number	33	23	32	42	25	10	12
% of histology tests	0.04	0.03	0.04	0.05	0.03	0.01	0.03
% of endocervical abnormalities	2.9	2.0	2.8	3.5	2.4	1.0	2.5
HE04.4 Carcinoma of the cervix (other)							
Number	13	31	28	28	19	16	9
% of histology tests	0.02	0.04	0.03	0.03	0.02	0.02	0.02
% of endocervical abnormalities	1.2	2.6	2.4	2.3	1.8	1.6	1.8
All endocervical abnormalities							
Number	1,126	1,176	1,172	1,212	1,058	1,029	489
Crude rate	1.49	1.50	1.43	1.47	1.31	1.28	1.31
AS rate	1.48	1.48	1.41	1.40	1.27	1.22	1.28

Notes

1. 'HE03 High-grade endocervical abnormality' combines endocervical dysplasia and adenocarcinoma in situ.
2. 'Crude rate' is the number of endocervical abnormalities, for each category of endocervical abnormality or for all endocervical abnormalities combined, detected by histology, as a proportion of the total number of histology tests; 'age-standardised (AS) rate' is the number of all endocervical abnormalities combined, detected by histology, as a proportion of the total number of histology tests age-standardised to the Australian population as at 30 June 2001.
3. Data for 1 January 2017 to 30 June 2017 may not be comparable with previous data that were for 12 months.

Source: AIHW analysis of state and territory cervical screening register data.

A5 Cytology–histology correlation

Table A5.1: Number of squamous abnormalities detected by cytology in 2015, and proportion followed by squamous histology within 6 months, women aged 20–69

Cytology prediction	Number detected by cytology	Number followed by squamous histology	Proportion followed by squamous histology (%)
S2 Possible low-grade	53,544	9,344	17.5
S3 Low-grade	34,979	8,531	24.4
S4 Possible high-grade	12,927	9,751	75.4
S5 High-grade	13,644	11,811	86.6
S6 High-grade plus	325	284	87.4
S7 Squamous cell carcinoma	135	118	87.4

Source: AIHW analysis of state and territory cervical screening register data.

Table A5.2: Correlation between squamous cytology and the most serious squamous histology within 6 months, in women aged 20–69, cytology tests performed in 2015

	Histology finding		
Cytology prediction	HS02 Low-grade	HS03 High-grade	HS04 Squamous cell carcinoma
S1 Negative	3,709 (16.7%)	1,027 (4.6%)	43 (0.2%)
S2 Possible low-grade	3,867 (41.4%)	1,341 (14.4%)	12 (0.1%)
S3 Low-grade	4,210 (49.3%)	1,764 (20.7%)	5 (0.1%)
S4 Possible high-grade	2,293 (23.5%)	4,970 (51.0%)	50 (0.5%)
S5 High-grade	1,384 (11.7%)	9,186 (77.8%)	191 (1.6%)
S6 High-grade plus	9 (3.2%)	184 (64.8%)	79 (27.8%)
S7 Squamous cell carcinoma	0 (0.0%)	27 (22.9%)	84 (71.2%)

Notes

1. Numbers and percentage of each squamous cytology result category are shown. Cytology data were included only where histology was performed within 6 months; cytology data not followed by histology, or followed by histology more than 6 months after cytology, are not included in the calculations.
2. For national consistency, the histology results of cervical intraepithelial (CIN) not otherwise specified (NOS), CIN II and CIN III are grouped together to form a broad high-grade abnormality category, and those of microinvasive and invasive squamous cell carcinoma are grouped together to form a broad squamous cell carcinoma category.

Source: AIHW analysis of state and territory cervical screening register data.

Table A5.3: Positive predictive value of high-grade squamous cytological abnormalities in women aged 20–69, most serious histology within 6 months of cytology performed in 2009 to 2015

	Cytology prediction			
Year	**Possible high-grade S4**	**High-grade S5**	**High-grade plus S6**	**High-grade**
2009	55.2% (4,748/8,607)	78.9% (10,935/13,859)	90.5% (228/252)	70.0% (15,911/22,718)
2010	54.8% (4,810/8,782)	79.2% (10,517/13,279)	92.4% (255/276)	69.8% (15,582/22,337)
2011	51.6% (4,999/9,688)	79.3% (11,129/14,033)	90.3% (250/277)	68.2% (16,378/23,998)
2012	52.5% (4,986/9,504)	78.8% (10,648/13,506)	92.5% (282/305)	68.3% (15,916/23,315)
2013	51.6% (5,149/9,975)	80.0% (10,865/13,586)	93.9% (260/277)	68.3% (16,274/23,838)
2014	51.0% (4,868/9,543)	78.8% (10,361/13,150)	96.7% (289/299)	67.5% (15,518/22,992)
2015	51.5% (5,020/9,751)	79.4% (9,377/11,811)	92.6% (263/284)	67.1% (14,660/21,846)

Note: The positive predictive value (PPV) is calculated as the proportion of squamous cytology results of possible or definite high-grade abnormality that were confirmed on histology to be a high-grade squamous abnormality or squamous cell carcinoma. Cytology data were included only where histology was performed within 6 months; cytology data not followed by histology, or followed by histology more than 6 months after cytology, are not included in the calculations.

Source: AIHW analysis of state and territory cervical screening register data.

Table A5.4: Number of endocervical abnormalities detected by cytology in 2015, and proportion followed by endocervical histology within 6 months, for women aged 20–69

Cytology prediction	Number detected by cytology	Number followed by histology	Proportion followed by histology (%)
E2 Atypical endocervical cells of uncertain significance	731	256	35.0
E3 Possible high-grade	470	228	48.5
E4 Adenocarcinoma in situ	269	229	85.1
E5 Adenocarcinoma in situ plus	18	9	50.0
E6 Adenocarcinoma	73	36	49.3

Source: AIHW analysis of state and territory cervical screening register data.

Table A5.5: Correlation between endocervical cytology and the most serious endocervical histology within 6 months, for women aged 20–69, cytology tests performed in 2015

	Histology finding		
Cytology prediction	HE02 Endocervical atypia	HE03 High-grade	HE04.1 and HE04.2 Adenocarcinoma
E1 Negative	11 (0.0%)	282 (1.2%)	87 (0.4%)
E2 Atypical endocervical cells of uncertain significance	2 (0.8%)	48 (18.8%)	11 (4.3%)
E3 Possible high-grade	1 (0.4%)	96 (42.1%)	32 (14.0%)
E4 Adenocarcinoma in situ	0 (0.0%)	160 (69.9%)	44 (19.2%)
E5 Adenocarcinoma in situ plus	0 (0.0%)	3 (33.3%)	4 (44.4%)
E6 Adenocarcinoma	0 (0.0%)	6 (16.7%)	23 (63.9%)

Notes

1. Numbers and percentage of each endocervical cytology result category shown. Cytology data were included only where histology was performed within 6 months; cytology data not followed by histology, or followed by histology more than 6 months after cytology, are not included in the calculations.
2. For national consistency, the histology results of endocervical dysplasia and adenocarcinoma in situ are grouped to form a broad high-grade abnormality category, and microinvasive and invasive adenocarcinoma are grouped to form a broad adenocarcinoma category.
3. The histology results of adenosquamous carcinoma and carcinoma of the cervix (other) are excluded, since these are not solely squamous or endocervical in origin, and thus would not necessarily be expected to correlate with cytology results of either cell type.

Source: AIHW analysis of state and territory cervical screening register data.

Table A5.6: Positive predictive value of high-grade endocervical cytological abnormalities in women aged 20–69, most serious histology within 6 months of cytology performed between 2009 and 2015

	Cytology prediction			
Year	Possible high-grade E3	Adenocarcinoma in situ E4	Adenocarcinoma in situ plus E5	High-grade
2009	54.1% (139/257)	89.2% (214/240)	78.6% (11/14)	71.2% (364/511)
2010	56.3% (120/213)	88.7% (212/239)	73.9% (17/23)	73.5% (349/475)
2011	55.6% (154/277)	86.0% (228/265)	100.0% (17/17)	71.4% (399/559)
2012	56.1% (143/255)	90.0% (216/240)	92.3% (12/13)	73.0% (371/508)
2013	55.2% (159/288)	85.4% (228/267)	88.2% (15/17)	70.3% (402/572)
2014	55.2% (148/268)	88.8% (215/242)	100.0% (15/15)	72.0% (378/525)
2015	56.1% (128/228)	89.1% (204/229)	77.8% (7/9)	72.7% (339/466)

Note: The positive predictive value is calculated as the proportion of endocervical cytology results of ‘possible’ or ‘definite’ high-grade that were confirmed on histology to be a high-grade endocervical abnormality or adenocarcinoma. These are prone to variability due to small numbers. Cytology data were included only where histology was performed within 6 months; cytology data not followed by histology, or followed by histology more than 6 months after cytology, are not included in the calculations.

Source: AIHW analysis of state and territory cervical screening register data.

Table A5.7: Cytology prediction preceding a histology finding of 'adenosquamous carcinoma' or 'other carcinoma of the cervix' in women aged 20–69, cytology performed in 2015

Cytology prediction	Adenosquamous carcinoma	Carcinoma of the cervix (other)
S1 Negative	9	10
S2 Possible low-grade	0	0
S3 Low-grade	1	0
S4 Possible high-grade	5	1
S5 High-grade	2	0
S6 High-grade with possible invasion	1	0
S7 Squamous cell carcinoma	2	1
E1 Negative	9	4
E2 Atypical endocervical cells of uncertain significance	1	0
E3 Possible high-grade	4	0
E4 Adenocarcinoma in situ	1	0
E5 Adenocarcinoma with possible invasion	1	0
E6 Adenocarcinoma	3	3

Source: AIHW analysis of state and territory cervical screening register data.

Table A5.8: Correlation between squamous cytology and the most serious squamous histology within 6 months in women aged 20–69 showing CIN II and CIN III, cytology tests performed in 2015

	Histology finding			
Cytology prediction	HS02 Low-grade	HS03.2 CIN II	HS03.3 CIN III	HS04 Squamous cell carcinoma
S1 Negative	1,677 (15.7%)	224 (2.1%)	244 (2.3%)	14 (0.1%)
S2 Possible low-grade	1,918 (36.5%)	394 (7.5%)	296 (5.6%)	8 (0.2%)
S3 Low-grade	2,010 (46.4%)	516 (11.9%)	310 (7.2%)	2 (0.0%)
S4 Possible high-grade	1,137 (22.3%)	959 (18.8%)	1,459 (28.6%)	22 (0.4%)
S5 High-grade	694 (10.9%)	1,197 (18.8%)	3,692 (57.9%)	99 (1.6%)
S6 High-grade plus	3 (2.1%)	7 (4.9%)	83 (58.0%)	42 (29.4%)
S7 Squamous cell carcinoma	0 (0.0%)	0 (0.0%)	13 (24.5%)	38 (71.7%)

Notes

1. Numbers and percentage of each squamous cytology result category are shown. Cytology data were included only where histology was performed within 6 months; cytology data not followed by histology, or followed by histology more than 6 months after cytology, are not included in the calculations.
2. States and territories unable to distinguish between CIN II and CIN III were excluded from all data and calculations in this table.
3. The high-grade category CIN NOS has been excluded from this table, but is a rare histology finding.

Source: AIHW analysis of state and territory cervical screening register data.

A6 Incidence of cervical cancer

Table A6.1: Incidence of cervical cancer, 1982 to 2015 (with estimates to 2019)

	New cases		AS rate	
Year of diagnosis	**20–69**	**All ages**	**20–69**	**All ages**
1982	829	966	19.1	14.3
1983	847	1,000	19.2	14.4
1984	844	1,018	18.6	14.3
1985	901	1,063	19.6	14.7
1986	863	1,023	18.7	14.0
1987	906	1,100	18.7	14.4
1988	903	1,068	18.1	13.6
1989	910	1,075	18.1	13.5
1990	924	1,094	18.1	13.5
1991	900	1,098	17.3	13.3
1992	848	1,026	16.0	12.2
1993	844	1,012	15.8	11.9
1994	938	1,145	17.1	13.1
1995	782	968	14.0	10.9
1996	757	937	13.4	10.4
1997	660	812	11.5	8.8
1998	700	873	11.9	9.3
1999	666	806	11.2	8.4
2000	599	769	9.9	7.9
2001	590	742	9.6	7.5
2002	562	694	9.0	6.9
2003	580	730	9.2	7.1
2004	588	731	9.2	7.0
2005	608	741	9.4	7.0
2006	598	730	9.1	6.8
2007	632	763	9.4	7.1
2008	648	792	9.5	7.2
2009	636	768	9.2	6.8
2010	686	821	9.6	7.2
2011	690	804	9.6	7.0
2012	729	865	10.1	7.4
2013	704	815	9.5	6.8
2014	767	889	10.2	7.3
2015	727	857	9.6	7.0

(continued)

Table A6.1 (continued): Incidence of cervical cancer, 1982 to 2015 (with estimates to 2019)

	New cases		AS Rate	
Year of diagnosis	**20–69**	**All ages**	**20–69**	**All ages**
2016	762	894	9.8	7.1
2017	776	910	9.8	7.1
2018	794	933	10.0	7.2
2019	810	951	10.0	7.2

Notes

1. 'Age-standardised (AS) rate' is the number of new cases of cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001.
2. Data for 2015 are estimated for NSW.
3. Estimated incidence data for 2016–2019 (in grey text) are based on 2006–2015 incidence data (including NSW estimates for 2015). Actual incidence data for 2016–2019 may differ from estimated data, due to current and ongoing program or practice changes.

Source: AIHW Australian Cancer Database 2015.

Table A6.2: Incidence of cervical cancer, by age, 2015

	20–24	**25–29**	**30–34**	**35–39**	**40–44**	**45–49**	**50–54**	**55–59**	**60–64**	**65–69**
New cases	9	58	108	111	105	94	65	72	58	48
Crude rate	1.1	6.6	12.3	14.0	12.6	11.8	8.3	9.7	8.8	8.2

Notes

1. 'Crude rate' is the number of new cases of cervical cancer per 100,000 women; rates based on fewer than 20 new cases should be interpreted with caution.
2. Data for 2015 are estimated for NSW.

Source: AIHW Australian Cancer Database 2015.

Table A6.3: Incidence of carcinoma of the cervix (squamous cell carcinoma, adenocarcinoma, adenosquamous carcinoma and other carcinoma) in women aged 20–69, 1982 to 2015

	New cases				AS rate			
Year of diagnosis	**SCC**	**AC**	**ASC**	**Other**	**SCC**	**AC**	**ASC**	**Other**
1982	655	92	22	35	15.0	2.1	0.5	0.8
1983	662	84	23	56	15.1	1.9	0.5	1.2
1984	633	87	45	52	13.9	1.9	1.0	1.1
1985	689	95	35	55	15.1	2.0	0.8	1.1
1986	646	117	42	39	13.9	2.5	1.0	0.8
1987	680	132	41	34	14.0	2.7	0.9	0.7
1988	650	157	40	42	13.1	3.1	0.8	0.8
1989	691	111	50	48	13.8	2.2	1.0	1.0
1990	643	146	49	61	12.6	2.8	1.0	1.2
1991	646	145	41	56	12.4	2.8	0.8	1.1
1992	614	136	50	38	11.6	2.6	1.0	0.7
1993	594	143	48	50	11.2	2.6	0.9	0.9
1994	639	201	40	49	11.7	3.6	0.7	0.9
1995	546	145	34	44	9.8	2.6	0.6	0.8
1996	526	147	40	32	9.4	2.6	0.7	0.6
1997	456	131	33	30	8.0	2.3	0.6	0.5
1998	490	143	30	29	8.4	2.4	0.5	0.5
1999	472	131	24	27	7.9	2.2	0.4	0.5
2000	402	117	30	27	6.7	1.9	0.5	0.4
2001	401	115	32	28	6.5	1.9	0.5	0.5
2002	390	127	17	20	6.3	2.0	0.3	0.3
2003	396	121	25	27	6.3	1.9	0.4	0.4
2004	393	133	27	23	6.1	2.1	0.4	0.4
2005	400	128	22	38	6.2	2.0	0.3	0.6
2006	371	147	22	37	5.6	2.2	0.3	0.6
2007	402	158	25	37	6.0	2.3	0.4	0.6
2008	428	164	20	26	6.3	2.4	0.3	0.4
2009	418	161	23	19	6.0	2.3	0.3	0.3
2010	458	145	29	35	6.4	2.0	0.4	0.5
2011	463	167	27	15	6.5	2.4	0.4	0.2
2012	479	172	23	42	6.6	2.4	0.3	0.6
2013	466	174	18	28	6.3	2.4	0.2	0.4
2014	496	195	32	32	6.6	2.6	0.4	0.4
2015	495	176	19	23	6.5	2.3	0.3	0.3

SCC = squamous cell carcinoma (ICD-O-3 8050–8078, 8083–8084); AC = adenocarcinoma (ICD-O-3 8140–8141, 8190–8211, 8230–8231, 8260–8263, 8382–8384, 8440–8490, 8570–8574, 8310, 8380, 8576); ASC = adenosquamous carcinoma (ICD-O-3 8560); Other = other and unspecified carcinoma (ICD-O-3 8010–8380, 8382–8576, excluding those in SCC, AC and ASC)

Note: 'Age-standardised (AS) rate' is the number of new cases of cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001; rates based on fewer than 20 new cases should be interpreted with caution. Data for 2015 are estimated for NSW.

Source: AIHW Australian Cancer Database 2015.

Table A6.4: Incidence of cervical cancer in women aged 20–69, by state and territory, 2010–2014

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
New cases	1,113	795	835	397	255	94	39	48	3,576
AS rate	9.4	8.7	11.5	10.4	9.9	11.8	6.3	13.1	9.8

Note: 'Age-standardised (AS) rate' is the number of new cases of cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001.

Source: AIHW Australian Cancer Database 2015.

Table A6.5: Incidence of cervical cancer in women aged 20–69, by remoteness, 2010–2014

	Major cities	Inner regional	Outer regional	Remote	Very remote	Australia
New cases	2,425	658	384	73	33	3,576
AS rate	9.3	10.3	12.2	15.3	12.1	9.8

Notes

1. Remoteness classification is based on area of usual residence (Statistical Local Area Level 2) at the time of diagnosis.
2. 'Australia' does not match the total because some women were not allocated to a remoteness area.
3. 'Age-standardised (AS) rate' is the number of new cases of cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001.

Source: AIHW Australian Cancer Database 2015.

Table A6.6: Incidence of cervical cancer in women aged 20–69, by socioeconomic group, 2010–2014

	1 (lowest)	2	3	4	5 (highest)	Australia
New cases	847	787	659	671	609	3,576
AS rate	12.4	11.1	9.0	8.9	8.0	9.8

Notes

1. Socioeconomic group was allocated using the ABS Index of Relative Socio-Economic Disadvantage based on area of usual residence (Statistical Local Area Level 2) at the time of diagnosis.
2. 'Australia' does not match the total because some women were not allocated to a socioeconomic group.
3. 'Age-standardised (AS) rate' is the number of new cases of cervical cancers per 100,000 women, age-standardised to the Australian population as at 30 June 2001.

Source: AIHW Australian Cancer Database 2015.

Table A6.7: Incidence of cervical cancer in women aged 20–69 (New South Wales, Victoria, Queensland, Western Australia and the Northern Territory), by Indigenous status, 2011–2015

	New South Wales, Victoria, Queensland, Western Australia, and the Northern Territory(a)		
	Indigenous	Non-Indigenous	Total(b)
New cases	162	2,746	3,188
Crude rate	20.0	8.6	9.7
AS rate	22.3	8.7	9.8

(a) Data shown for 'Indigenous', 'Non-Indigenous' and 'Total' are for New South Wales, Victoria, Queensland, Western Australia and the Northern Territory only; data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer registration data at the time this report was prepared.

(b) 'Total' includes those whose Indigenous status was not stated.

Notes

1. 'Crude rate' is the number of new cases of cervical cancer per 100,000 women; 'age-standardised (AS) rate' is the number of new cases of cervical cancer per 100,000 women, directly age-standardised to the Australian population as at 30 June 2001.
2. Some states and territories use an imputation method for determining Indigenous cancers, which may lead to differences between these data and those shown in jurisdictional cancer incidence reports. Data for 2015 are estimated for NSW.

Source: AIHW Australian Cancer Database 2015.

Survival after a diagnosis of cervical cancer

Table A6.8: Five-year relative survival from cervical cancer, by age, 2011–2015

Age group	5-year relative survival (%)
<20	n.p.
20–24	87.9
25–29	91.9
30–34	89.7
35–39	87.8
40–44	84.0
45–49	77.9
50–54	71.3
55–59	64.4
60–64	62.0
65–69	56.4
70–74	49.5
75+	42.2
All ages	**73.5**
Ages 20–69 years	**78.9**

n.p. = not published

Note: Relative survival was calculated with the period method, using the period 2011–2015 (Brenner & Gefeller 1996). This period does not contain incidence data for 2015 for NSW.

Source: AIHW Australian Cancer Database 2015.

Table A6.9: Trend in 5-year relative survival from cervical cancer, in women aged 20–69, 1986–1990 to 2011–2015

Year	5-year relative survival (%)
1986–1990	73.9
1991–1995	78.1
1996–2000	79.3
2001–2005	77.8
2006–2010	77.4
2011–2015	78.9

Note: 'Relative survival' was calculated with the period method, using the period 2011–2015 (Brenner & Gefeller 1996). This period does not contain incidence data for 2015 for NSW.

Source: AIHW Australian Cancer Database 2015.

Table A6.10: Relative survival at diagnosis and 5-year conditional survival from cervical cancer, in women aged 20–69, 2011–2015

	Relative survival	Conditional survival	
Years after diagnosis	Relative survival (%)	Years already survived	5-year conditional relative survival (%)
1	92.4	. .	. .
2	85.9	. .	. .
3	82.6	. .	. .
4	80.4	. .	. .
5	78.9	0	84.6
6	78.1	1	89.7
7	77.1	2	92.8
8	76.6	3	94.8
9	76.2	4	96.2
10	75.9	5	96.1
11	75.1	6	96.7
12	74.6	7	96.3
13	73.8	8	95.7
14	72.9	9	95.7
15	72.7	10	96.2
16	72.3	11	96.4
17	71.9	12	96.6
18	71.3	13	96.8
19	70.6	14	96.6
20	70.2	15	84.6

Note: Relative survival was calculated with the period method, using the period 2011–2015 (Brenner & Gefeller 1996). This period does not contain incidence data for 2015 for New South Wales.

Source: AIHW Australian Cancer Database 2015.

A7 Mortality from cervical cancer

Table A7.1: Mortality from cervical cancer, 1982 to 2017 (with estimates to 2019)

	Deaths		AS rate	
Year	**20–69**	**All ages**	**20–69**	**All ages**
1982	237	346	5.5	5.2
1983	248	343	5.6	5.0
1984	223	339	5.0	4.9
1985	234	363	5.1	5.1
1986	240	341	5.1	4.6
1987	225	348	4.8	4.6
1988	219	345	4.5	4.5
1989	243	369	4.9	4.7
1990	245	339	4.8	4.2
1991	204	331	4.0	4.0
1992	188	322	3.6	3.8
1993	204	318	3.9	3.7
1994	223	341	4.2	4.0
1995	211	334	3.9	3.8
1996	174	301	3.1	3.3
1997	160	285	2.8	3.0
1998	153	260	2.6	2.7
1999	131	227	2.2	2.3
2000	154	265	2.6	2.6
2001	156	271	2.5	2.6
2002	126	217	2.0	2.1
2003	140	239	2.2	2.2
2004	119	210	1.8	1.9
2005	136	221	2.0	2.0
2006	137	228	2.0	2.0
2007	125	201	1.8	1.7
2008	145	237	2.0	2.0
2009	143	242	1.9	1.9
2010	151	230	2.0	1.9
2011	152	228	2.0	1.8
2012	141	225	1.8	1.7
2013	154	229	2.0	1.8
2014	146	217	1.8	1.6
2015	145	233	1.8	1.8
2016	170	256	2.1	1.9
2017	140	230	1.7	1.6

(continued)

Table A7.1 (continued): Mortality from cervical cancer, 1982 to 2017 (with estimates to 2019)

	Deaths		AS rate	
Year	20–69	All ages	20–69	All ages
2018	167	258	1.9	1.8
2019	170	262	1.9	1.8

Notes

1. Deaths from 1982 to 2016 were derived by year of death; deaths in 2017 were derived by year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. 'Age-standardised (AS) rate' is number of deaths from cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001.
3. Estimated mortality data for 2018–2019 (in grey text) are based on 2004–2013 mortality data. Actual mortality data for 2018–2019 may differ from estimated data for 2018–2019, due to current and ongoing program or practice changes.

Source: AIHW National Mortality Database.

Table A7.2: Mortality from cervical cancer, by age, 2017

	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69
Deaths	0	4	6	13	15	16	23	20	19	24
Crude rate	0.0	0.4	0.6	1.6	1.9	1.9	2.9	2.6	2.8	4.0

Note: 'Crude rate' is the number of deaths from cervical cancer per 100,000 women; rates based on fewer than 20 deaths should be interpreted with caution.

Source: AIHW National Mortality Database.

Table A7.3: Mortality from cervical cancer in women aged 20–69, by state and territory, 2013–2017

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Deaths	221	154	188	88	58	26	11	9	755
AS rate	1.7	1.5	2.4	2.1	2.0	3.0	1.6	2.4	1.9

Notes

1. Deaths from 2013 to 2016 were derived by year of death; deaths in 2017 were derived by year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
2. 'Age-standardised (AS) rate' is the number of deaths from cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001; rates based on fewer than 20 deaths should be interpreted with caution.

Source: AIHW National Mortality Database.

Table A7.4: Mortality from cervical cancer in women aged 20–69, by remoteness area, 2013–2017

	Major cities	Inner regional	Outer regional	Remote	Very remote	Australia
Deaths	482	151	97	9	11	755
AS rate	1.7	2.0	2.8	1.8	3.9	1.9

Notes

1. Remoteness classification is based on area of usual residence (Statistical Local Area Level 2) at time of death.
2. 'Australia' does not match the total, because some women were not allocated to a remoteness area.
3. Deaths from 2013 to 2016 were derived by year of death; deaths in 2017 were derived by year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
4. 'Age-standardised (AS) rate' is the number of deaths from cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001; rates based on fewer than 20 deaths should be interpreted with caution.

Source: AIHW National Mortality Database.

Table A7.5: Mortality from cervical cancer in women aged 20–69, by socioeconomic group, 2013–2017

	1 (lowest)	2	3	4	5 (highest)	Australia
Deaths	204	172	165	124	84	755
AS rate	2.8	2.1	2.0	1.5	1.0	1.9

Notes

1. Socioeconomic group was allocated using the ABS Index of Relative Socio-Economic Disadvantage based on area of usual residence (Statistical Local Area Level 2) at time of death.
2. 'Australia' does not match the total, because some women were not allocated to a socioeconomic group.
3. Deaths from 2013 to 2016 were derived by year of death; deaths in 2017 were derived by year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.
4. 'Age-standardised (AS) rate' is the number of deaths from cervical cancer per 100,000 women, age-standardised to the Australian population as at 30 June 2001; rates based on fewer than 20 deaths should be interpreted with caution.

Source: AIHW National Mortality Database.

Table A7.6: Mortality from cervical cancer in women aged 20–69 (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory), by Indigenous status, 2013–2017

	New South Wales, Queensland, Western Australia, South Australia and the Northern Territory[(a)]		
	Indigenous	Non-Indigenous	Total[(b)]
Deaths	46	513	564
Crude rate	5.3	1.9	2.1
AS rate	6.4	1.8	2.0

(a) Data shown for 'Indigenous', 'Non-Indigenous' and 'Total' are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only; data from these jurisdictions were considered to have adequate levels of Indigenous identification in cancer mortality data at the time this report was prepared.

(b) 'Total' includes those whose Indigenous status is not stated.

Notes

1. 'Crude rate' is the number of deaths from cervical cancer per 100,000 women; 'age-standardised (AS) rate' is the number of deaths from cervical cancer per 100,000 women, directly age-standardised to the Australian population as at 30 June 2001.
2. Deaths from 2013 to 2016 were derived by year of death; deaths in 2017 were derived by year of registration of death. Deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

Source: AIHW National Mortality Database.

Appendix B: National Cervical Screening Program information

Performance indicators

The effectiveness of the NCSP has been monitored since 1996–1997 using performance indicators developed to monitor what were originally defined as essential aspects of the program. Full definitions of the original performance indicators can be found in *Breast and cervical cancer screening in Australia 1996–1997* (AIHW 1998). New performance indicators were developed following a review that considered changes to both the NCSP and the cervical screening environment to ensure that the NCSP continued to be monitored optimally. These new performance indicators were officially endorsed in September 2009 by the Screening Subcommittee of the Australian Population Health Development Principal Committee for use by the NCSP, and appeared for the first time in *Cervical screening in Australia 2008–2009* (AIHW 2011).

Table B1 lists the performance indicators for the previous NCSP that appear in this report (performance indicators developed for the current NCSP will be used on cervical screening data reported for women screened from 1 December 2017).

Table B1: Performance indicators for the National Cervical Screening Program

Performance indicator	Definition
1 Participation	The percentage of women aged 20–69 who have a Papanicolaou smear or 'Pap test' in a 2-year period
2 Rescreening	
2.1 Early rescreening	The proportion of women who have another Pap test within 21 months of a negative Pap test result
2.2 Rescreening after 27-month cervical screening register reminder letter	The proportion of women who have a Pap test within 3 months of being sent a 27-month reminder letter
3 Cytology	The number of Pap test results in each result category
4 Histology	The number of histology results in each result category (including the number of women with a high-grade histology for every 1,000 women screened)
5 Cytology–histology correlation	A measure of how well cytology correlates with histology performed not more than 6 months after the cytology test
6 Incidence	The number of new cases of cervical cancer
7 Mortality	The number of deaths from cervical cancer

Note: Further details and definitions of performance indicators are available in the report *Cervical screening in Australia 2008–2009* (AIHW 2011) and in the *National cervical cancer prevention data dictionary version 1: working paper* (AIHW 2014).

Source: AIHW 2014.

Standards

While there are no official standards for NCSP performance indicators used in this report, NPAAC standards in *Performance measures for Australian laboratories reporting cervical cytology* (NPAAC 2006) that were used under the previous NCSP have been used to provide a benchmark for the data presented. These are used as a guide to interpretation only, since this is a different purpose from that for which these standards were developed, and differences in definitions and data may exist.

Table B2: Links for the state and territory and Australian Government components of the National Cervical Screening Program

Cervical Screening NSW	https://www.cancer.nsw.gov.au/cervical-screening-nsw
Cancer Council Victoria	https://www.cancer.org.au/cervicalscreening/section1
Queensland Cervical Screening Program	https://www.health.qld.gov.au/public-health/cancer-screening/cervical
WA Cervical Cancer Prevention Program	https://ww2.health.wa.gov.au/Articles/U_Z/WA-Cervical-Cancer-Prevention-Program-for-health-professionals
SA Cervix Screening Program	http://www.sahealth.sa.gov.au/wps/wcm/connect/Public+Content/SA+Health+Internet/About+us/Department+of+Health/Public+Health+and+Clinical+Systems/Public+Health+Services/SA+Cervix+Screening+Program/SA+Cervix+Screening+Program
Tasmanian Cervical Cancer Prevention Program	https://www.dhhs.tas.gov.au/cancerscreening/population_screening_and_cancer_prevention/cervical_screening/tasmanian_cervical_cancer_prevention_program
ACT Cervical Screening Program	https://www.health.act.gov.au/services-and-programs/women-youth-and-children/womens-health/cervical-screening
Cervical Screening NT	https://nt.gov.au/wellbeing/health-conditions-treatments/womens-health/cervical-screening
Australian Government Department of Health	http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/cervical-screening-1 cancerscreening@health.gov.au
Australian Institute of Health and Welfare	https://www.aihw.gov.au/reports-data/health-welfare-services/cancer-screening/overview screening@aihw.gov.au

Appendix C: Data sources

The multiple data sources used for this report are summarised in Table C1.

Table C1: Data sources for *Cervical screening in Australia 2019*

Data used to monitor cervical screening in Australia	Data source
Performance Indicator 1 Participation	State and territory cervical screening registers; ABS population data
Performance Indicator 2 Rescreening	State and territory cervical screening registers
Performance Indicator 3 Cytology	State and territory cervical screening registers
Performance Indicator 4 Histology	State and territory cervical screening registers
Performance Indicator 5 Cytology–histology correlation	State and territory cervical screening registers
Expenditure on cervical screening	AIHW Health expenditure database; Medicare Australia statistics
HPV vaccination	National HPV Vaccination Program Register
Performance Indicator 6 Incidence of cervical cancer	AIHW Australian Cancer Database; ABS population data
Survival of cervical cancer	AIHW Australian Cancer Database
Prevalence of cervical cancer	AIHW Australian Cancer Database
Performance Indicator 7 Mortality from cervical cancer	AIHW National Mortality Database; ABS population data
Burden of cervical cancer	Australian Burden of Disease Study 2011

State and territory cervical screening registers

Data for the performance indicators 'Participation', 'Rescreening', 'Cytology', 'Histology' and 'Cytology–histology correlation' were provided by the cervical screening register that existed in each state and territory, according to definitions and data specifications in the *National cervical cancer prevention data dictionary version 1: working paper* (AIHW 2014). These data were compiled into national figures by the AIHW to allow national monitoring of the NCSP.

The Data Quality Statement for cervical screening data can be found on the AIHW website at http://meteor.aihw.gov.au/content/index.phtml/itemId/699940.

AIHW Australian Cancer Database

All forms of cancer, except basal and squamous cell carcinomas of the skin, are notifiable diseases in each Australian state and territory. Legislation in each jurisdiction requires hospitals, pathology laboratories and various other institutions to report all cases of cancer to their central cancer registry. An agreed subset of the data collected by these cancer registries is supplied annually to the AIHW, where it is compiled into the Australian Cancer Database (ACD). The ACD currently contains data on all cases of cancer diagnosed from 1982 to 2014 for all states and territories, and for 2015 cases for all jurisdictions except New South Wales. Cancer reporting and registration is a dynamic process, and records in the state and territory cancer registries may be modified if new information is received. Hence, the number of cancer cases reported by the AIHW for any particular year may change slightly over time and may not always align with state and territory reporting for that year.

The Data Quality Statement for the ACD 2014 can be found at http://meteor.aihw.gov.au/content/index.phtml/itemId/687104.

AIHW National Mortality Database

The AIHW National Mortality Database (NMD) contains information provided by the registries of births, deaths and marriages and the National Coronial Information System (coded by the ABS), for deaths from 1964 to 2017. The Registry of Births, Deaths and Marriages in each state and territory is responsible for the registration of deaths. These data are then collated and coded by the ABS and maintained at the AIHW in the NMD.

In the NMD, both the year in which death occurred and the year in which it was registered are provided. For the purposes of this report, actual mortality data are based on the year the death occurred, except for the most recent year (2017), for which the number of people whose death was registered is used. Previous investigation has shown that the year of death and its registration coincide for the most part. However, in some instances, deaths at the end of each calendar year may not be registered until the following year. Thus, year-of-death information for the latest available year is generally an underestimate of the actual number of deaths that occurred in that year.

In this report, deaths registered in 2014 and earlier are based on the final version of cause of death data; deaths registered in 2015 are based on the revised version; and deaths registered in 2016 and 2017 are based on the preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

The data quality statements underpinning the AIHW NMD can be found at:

- ABS quality declaration summary for Deaths, Australia, 2017 (ABS cat. no. 3302.0) http://www.abs.gov.au/ausstats/abs%40.nsf/mf/3302.0/
- ABS quality declaration summary for Causes of death, Australia, 2017 (ABS cat. no. 3303.0) http://www.abs.gov.au/ausstats/abs%40.nsf/mf/3303.0/.

For more information on the AIHW NMD and deaths data, see https://www.aihw.gov.au/about-our-data/our-data-collections/national-mortality-database/deaths-data.

Aboriginal and Torres Strait Islander deaths

The ABS Death Registrations collection identifies a death as Aboriginal and Torres Strait Islander where the deceased is recorded as Aboriginal, Torres Strait islander, or both, on the Death Registration Form. Since 2007, the Indigenous status of the deceased has also been derived from the Medical Certificate of Cause of Death for South Australia, Western Australia, Tasmania, the Northern Territory and the Australian Capital Territory. For New South Wales and Victoria, the Indigenous status of the deceased is derived from the Death Registration Form only. If the Indigenous status reported in this form does not agree with that in the Medical Certificate of Cause of Death, an identification from either source that the deceased was an Aboriginal and/or Torres Strait Islander person is given preference over identifying them as non-Indigenous.

AIHW Health Expenditure Database

The AIHW Health Expenditure Database contains estimates of expenditure by disease category, age group and sex for each of the following areas of expenditure: admitted patient hospital services, out-of-hospital medical services, prescription pharmaceuticals, optometrical and dental services, community mental health services, and public health cancer screening.

The Data Quality Statement for the Health Expenditure Database 2015–16 can be found at http://meteor.aihw.gov.au/content/index.phtml/itemId/688305.

Australian Burden of Disease Study 2011

The Australian Burden of Disease Study 2011 provides Australian-specific burden of disease estimates for the Australian population and, separately, for the Aboriginal and Torres Strait Islander population, for 2011 and 2003. The study uses and adapts the methods of global studies to produce estimates that are more relevant to the Australian health policy context.

The 2011 reference year was chosen, as this was the latest year of data available for most of the key mortality and morbidity data sources used in the study at its start.

Results from the study provide an important resource for health policy formulation, service planning and population health monitoring, including the gap between Indigenous and non-Indigenous health. The results provide a foundation for further assessments, such as in relation to health interventions that aim to prevent or treat diabetes and its complications, and disease expenditure.

National HPV Vaccination Program Register

The National HPV Vaccination Program Register supported the National HPV Vaccination Program funded by the Australian Government and played an essential role in monitoring and evaluating the program by recording information about HPV vaccine doses administered in Australia. The National HPV Vaccination Program Register was operated by the VCS Foundation until 31 December 2018, after which it was incorporated into the Australian Immunisation Register.

Links to HPV vaccination coverage data in this report are available at http://www.hpvregister.org.au/.

ABS population data

Throughout this report, population data were used to derive rates of participation in cervical screening, cervical cancer incidence and cervical cancer mortality. The population data were sourced from the ABS using the most up-to-date estimates available at the time of analysis.

To derive its estimates of the resident populations, the ABS uses the 5-yearly Census of Population and Housing data, adjusted as follows:

- all respondents in the Census are placed in their state or territory, Statistical Area and postcode of usual residence; overseas visitors are excluded
- an adjustment is made for persons missed in the Census
- Australians temporarily overseas on Census night are added to the usual residence Census count.

Estimated resident populations are then updated each year from the Census data, using indicators of population change, such as births, deaths and net migration. More information is available from the ABS website at www.abs.gov.au.

For the Indigenous comparisons in this report, the most recently released Indigenous experimental estimated resident populations, as released by the ABS, were used. Those estimates were based on the 2011 Census of Population and Housing.

Hysterectomy fractions

Hysterectomy fractions represent the proportion of women with an intact uterus (and cervix) at a particular age, and are the tool used to adjust the population for participation calculations. This is because women who have had a hysterectomy with their cervix removed are not at risk of cervical cancer and thus do not require screening. Since a substantial proportion (20%–30%) of middle-aged and older women in Australia do not have an intact cervix, the population is adjusted to remove these women, so that true participation in cervical screening can be more accurately estimated.

Previously, the AIHW used hysterectomy fractions derived from self-reported information on hysterectomies collected in the 2001 National Health Survey (NHS) conducted by the ABS. However, hysterectomy incidence has fallen since 2001, which means the 2001 NHS hysterectomy fractions no longer allow accurate estimates. Thus, the introduction of new performance indicators in the AIHW annual monitoring report *Cervical screening in Australia 2008–2009* (AIHW 2011) provided an appropriate opportunity to update the method by which hysterectomy fractions were estimated.

The National Hospital Morbidity Database (NHMD) is based on summary records of patient separations, referring to episodes of care in public and private hospitals; it allows us to view relatively complete hysterectomy numbers and rates for financial years from the mid-1990s. These data were used, with projections forward and backward where required, to generate estimates of current hysterectomy prevalence for women aged 20–69. Published hysterectomy incidence trends, as well as data from the 1995, 2001 and 2004–05 NHS, were drawn on to ensure accuracy in assumptions.

The results of these combined approaches are robust hysterectomy fractions that reflect both historical and current hysterectomy trends, which can be used in the calculation of participation in cervical screening for the most recent participation data.

The fractions themselves are similar to previous estimates taken from population health surveys, with the proportion of women with an intact cervix remaining comparatively higher in most age groups, a reflection of the national trend of decreasing incidence of hysterectomies over time. These are shown next to the previously adopted hysterectomy fractions based on the 2001 NHS in Table C2.

Table C2: National hysterectomy fractions

Age group (years)	% of women who have not had a hysterectomy	
	Derived from NHS 2001	Modelled on NHMD
20–24	100.0	100.0
25–29	100.0	99.7
30–34	98.9	98.8
35–39	95.6	96.2
40–44	90.6	91.6
45–49	82.5	85.9
50–54	76.5	81.0
55–59	66.2	77.2
60–64	68.9	73.6
65–69	66.8	70.6

Source: AIHW analysis of the National Hospital Morbidity Database.

Incorporating these new hysterectomy fractions (based on lower prevalence of hysterectomy procedures) into calculations for cervical screening participation results in a slight decrease in the participation rate compared with calculations using the previous hysterectomy fractions. This would be expected, since the population at risk (and therefore the population eligible for cervical screening) is larger.

Appendix D: Classifications

Age

The data in this report are stratified by the age of the woman at the time of the specified test (for screening data), at the time of diagnosis (for cancer incidence data), or at the time of death (for cancer mortality data).

State or territory

The state or territory reported is the one where screening took place (for the screening data), where the diagnosis was made (for the cancer incidence data), or the place of usual residence (for the cancer mortality data).

This means that it is possible for a woman to be double-counted in the screening data. If she was screened in one jurisdiction and then screened again less than 2 years later in another jurisdiction, both screens may be included in participation. This should, however, have only a small effect on the reported participation.

Remoteness area

The remoteness areas divide Australia into broad geographical regions that share common characteristics of remoteness for statistical purposes. The remoteness structure divides each state and territory into several regions on the basis of their relative access to services. There are 6 classes of remoteness area: *Major cities*, *Inner regional*, *Outer regional*, *Remote*, *Very remote* and *Migratory*. The category *Major cities* includes Australia's capital cities, except for Hobart and Darwin, which are classified as *Inner regional*. Remoteness areas are based on the Accessibility and Remoteness Index of Australia, produced by the Australian Population and Migration Research Centre at the University of Adelaide.

For participation calculations, women were allocated to a remoteness area using their residential postcode, as supplied at the time of screening. Caution is required when examining differences across remoteness areas for the following reasons: firstly, postcodes used to allocate women may not represent their location of usual residence; secondly, as these are based on the 2011 Census, the accuracy of remoteness area classifications diminishes, due to subsequent changes in demographics; thirdly, some postcodes (and hence some individual women) are unable to be allocated to a remoteness area.

Socioeconomic group

The Index of Relative Socio-Economic Disadvantage (one of four Socio-Economic Indexes for Areas developed by the ABS) is based on factors such as average household income, education levels and unemployment rates. It is not a person-based measure but an area-based measure of socioeconomic disadvantage in which small areas of Australia are classified on a continuum from disadvantaged to affluent. This information is used as a proxy for the socioeconomic disadvantage of people living in those areas and may not be correct for each person in that area.

In this report, the first socioeconomic group (quintile 1) corresponds to geographical areas containing the 20% of the population with the greatest socioeconomic disadvantage according to the Index of Relative Socio-Economic Disadvantage (that is, the lowest socioeconomic group), and the fifth group (quintile 5) corresponds to the 20% of the population with the least socioeconomic disadvantage (that is, the highest socioeconomic group).

For participation, women were allocated to a socioeconomic group using their residential postcode, as supplied at the time of screening. Caution is required when examining differences across socioeconomic groups for the following reasons: firstly, postcodes used to allocate women may not represent their location of residence; secondly, as these are based on the 2011 Census, the accuracy of socioeconomic group classifications diminishes due to subsequent changes in demographics; thirdly, many postcodes (and hence women) are unable to be allocated to a socioeconomic group.

Classification of cervical cancer by histology

Histology codes to classify cervical cancer into histological groups are listed in Table D1.

Table D1: Cervical cancer by histological type

Type of cervical cancer	ICD-O-3 codes
1: Carcinoma	8010–8380, 8382–8576
1.1: Squamous cell carcinoma	8050–8078, 8083–8084
1.2: Adenocarcinoma	8140–8141, 8190–8211, 8230–8231, 8260–8263, 8382–8384, 8440–8490, 8570–8574, 8310, 8380, 8576
1.3: Adenosquamous carcinoma	8560
1.4: Other specified and unspecified carcinoma	ICD-O-3 codes for carcinoma excluding those for squamous cell carcinoma, adenocarcinoma and adenosquamous carcinoma
2: Sarcoma	8800–8811, 8840–8921, 8990–8991, 9040–9044, 9120–9133, 9540–9581, 8830, 9150
3: Other specified and unspecified malignant neoplasm	ICD-O-3 codes for cervical cancer, excluding those for carcinoma and sarcoma

Appendix E: Statistical methods

Crude rates

A ‘crude rate’ is defined as the number of events over a specified period of time (for example, a year), divided by the total population. For example, a crude cancer incidence rate is similarly defined as the number of new cases of cancer in a specified period of time divided by the population at risk. Crude mortality rates and cancer incidence rates are expressed in this report as number of deaths or new cases per 100,000 population. ‘Crude participation rate’ is expressed as a percentage.

Age-specific rates

Age-specific rates provide information on the incidence of a particular event in an age group, relative to the total number of people at risk of that event in the same age group. It is calculated by dividing the number of events occurring in each specified age group by the corresponding ‘at-risk’ population in the same age group, and then multiplying the result by a constant (for example, 100,000) to derive the rate. Age-specific rates are often expressed per 100,000 population.

Age-standardised rates

A crude rate provides information on the number of, for example, new cases of cancer or deaths from cancer in the population at risk in a specified period. No age adjustments are made when calculating a crude rate. Since the risk of cancer is heavily dependent on age, crude rates are not suitable for looking at trends or making comparisons across groups in cancer incidence and mortality.

More meaningful comparisons can be made by using age-standardised rates, with such rates adjusted for age in order to facilitate comparisons between populations that have different age structures, for example, between Indigenous people and other Australians. This standardisation process effectively removes the influence of age structure on the summary rate.

Two methods are commonly used to adjust for age: direct and indirect standardisation. In this report, the direct standardisation approach presented by Jensen and colleagues (1991) is used. To age-standardise using the direct method, the first step is to obtain population numbers and numbers of cases (or deaths) in age ranges, typically 5-year age ranges. The next step is to multiply the age-specific population numbers for the standard population (in this case, the Australian population as at 30 June 2001) by the age-specific incidence rates (or death rates) for the population of interest (such as those in a certain socioeconomic group or those who lived in *Major cities*). The next step is to sum across the age groups and divide this sum by the total of the standard population, to give an age-standardised rate for the population of interest. Finally, this is expressed per 1,000 or 100,000, as appropriate.

Acknowledgments

Cervical screening in Australia 2019 was produced by Alison Budd, Biljana Tanevska, Christopher Rompotis, Natasha Bartlett and Rachel Kilo under the direction of David Meere.

This report was produced in collaboration with the National Cervical Screening Program, and thanks are extended to the state and territory program and data managers listed here for providing data, expertise and overall assistance in the production of this document.

Thanks are also extended to all state and territory cancer registries, which are the source of data on cervical cancer incidence (through the Australian Cancer Database), and to the Australian Bureau of Statistics, National Coronial Information System, and state and territory registrars of births, deaths and marriages, which are the source of data on cervical cancer mortality (through the AIHW National Mortality Database).

Financial support and professional assistance provided by the Screening Policy Section of the Australian Government Department of Health are also gratefully acknowledged.

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Abbreviations

ABS	Australian Bureau of Statistics
AC	adenocarcinoma
ACD	Australian Cancer Database
ACT	Australian Capital Territory
AHMAC	Australian Health Ministers' Advisory Council
AIHW	Australian Institute of Health and Welfare
AIS	adenocarcinoma in situ
AMBS	Australian Modified Bethesda System
AS	age-standardised
ASC	adenosquamous carcinoma
ASGS	Australian Statistical Geography Standard
CIN	cervical intraepithelial neoplasia
CST	Cervical Screening Test
DALY	disability-adjusted life years
Dec	December
DNA	deoxyribonucleic acid
GP	general practitioner
HPV	human papillomavirus
HSIL	high-grade squamous intraepithelial lesion
ICD	International Classification of Disease
ICD-O-3	International Classification of Diseases for Oncology, 3rd Edition
IRSD	Index of Relative Socio-Economic Disadvantage
Jan	January
Jun	June
LBC	liquid-based cytology
LSIL	low-grade intraepithelial lesion
MBS	Medicare Benefits Schedule
MCCD	Medical Certificate of Cause of Death
MSAC	Medical Services Advisory Committee
NCSP	National Cervical Screening Program
NHMD	National Hospital Morbidity Database
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
nKPI	national key performance indicator

NMD	National Mortality Database
NOS	not otherwise specified
NIP	National Immunisation Program
NPAAC	National Pathology Accreditation Advisory Council
NSW	New South Wales
NT	Northern Territory
PPV	positive predictive value
Qld	Queensland
RA	remoteness area
SA	South Australia
SCC	squamous cell carcinoma
SEIFA	Socio-Economic Indexes for Areas
Tas	Tasmania
Vic	Victoria
WA	Western Australia
WHO	World Health Organization
YLD	years lived with disability
YLL	years of life lost

Symbols

n.p.	not published
. .	not applicable
<	less than

Glossary

Aboriginal or Torres Strait Islander: A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. See also **Indigenous**.

age-specific rate: A rate for a specific age group. The numerator and denominator relate to the same age group.

age-standardised rate: A method of removing the influence of age when comparing populations with different age structures. This is usually necessary as the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure, which allows comparison of disease rates.

Australian Statistical Geography Standard: Common framework defined by the Australian Bureau of Statistics for collection and dissemination of geographically classified statistics; it replaced the Australian Standard Geographical Classification in July 2011.

biopsy: Small sample of tissue that is taken to obtain a definitive diagnosis of an abnormality.

burden of disease: The quantified impact of a disease or injury on a population.

cancer (malignant neoplasm): A large range of diseases in which some of the body's cells become defective and begin to multiply out of control. These cells can invade and damage the area around them and can also spread to other parts of the body to cause further damage.

cancer death: A death where the underlying cause of death is indicated as cancer. People with cancer who die of other causes are not counted in the **mortality** statistics in this publication.

current NCSP: The renewed NCSP that uses HPV testing as its primary screening tool, and commenced on 1 December 2017.

cytology: The 'study of cells' and, in the context of cervical screening, the cells from the cervix that are collected and examined for abnormalities. Cervical cytology using the **Pap test** is the primary screening tool of the National Cervical Screening Program.

disability-adjusted life years: A measure (in years) of healthy life lost, either through premature death (defined as dying before the ideal life span) or, equivalently, through living with ill health due to illness or injury.

endocervical abnormality (cytology): An endocervical result of 'E2 Atypical endocervical cells of uncertain significance', 'E3 Possible high-grade endocervical glandular lesion', 'E4 Adenocarcinoma in situ', 'E5 Adenocarcinoma in situ with possible microinvasion/invasion' or 'E6 Adenocarcinoma', regardless of the corresponding squamous result for that **cytology** test.

endocervical abnormality (histology): An endocervical result of 'HE02 Endocervical atypia', 'HE03.1 Endocervical dysplasia', 'HE03.2 Adenocarcinoma in situ', 'HE04.1 Microinvasive adenocarcinoma', 'HE04.2 Invasive adenocarcinoma', 'HE04.3 Adenosquamous carcinoma' or 'HE04.4 Carcinoma of the cervix (other)' regardless of any squamous result. Note that HE04.3 Adenosquamous carcinoma and HE04.4 Carcinoma of the cervix (other) are included as endocervical abnormalities for data reporting purposes, but that the former is not solely of endocervical origin, and the latter comprises rarer carcinomas of other epithelial origin.

false negative: A test that has incorrectly indicated that the disease is not present.

false positive: A test that has incorrectly indicated that the disease is present.

high-grade abnormality detection rate: The number of women per 1,000 screened with a histologically confirmed high-grade abnormality; namely, a cervical intraepithelial neoplasia (CIN) that has been graded as ‘moderate’ (CIN II) or ‘severe’ (CIN III), or for which the grade has not been specified; endocervical dysplasia; or adenocarcinoma in situ.

histology: Examination of tissue from the cervix through a microscope, which is the primary diagnostic tool of the National Cervical Screening Program.

HPV: Human papillomavirus, a virus that affects both males and females. There are around 100 types of HPV, with around 40 types known as ‘genital HPV’, which are contracted through sexual contact. Persistent infection with **oncogenic HPV** types can lead to cervical cancer, whereas infection with non-oncogenic types of HPV can cause genital warts.

Indigenous: A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. See also **Aboriginal or Torres Strait Islander**.

in situ: A Latin term meaning ‘in place or position’; undisturbed.

incidence: The number of new cases (for example, of an illness or event) occurring during a given period, usually 1 year.

morbidity: Illness.

mortality: The number of deaths occurring during a given period.

National HPV Vaccination Program: A program introduced on 1 April 2007, initially for females. At inception, it comprised an ongoing vaccination program for girls aged 12–13 (administered through schools) and a catch-up program for females aged 13–26 between 2007 and 2009, with females aged 13–17 vaccinated through schools and women aged 18–26 vaccinated through the community. From February 2013, the current school-based program for girls aged 12–13 was extended to boys aged 12–13, with a catch-up program in 2013 and 2014 for boys aged 14–15.

negative cytology: A cervical **cytology** test where the squamous result is ‘S1 Negative’ and the endocervical result is either ‘E0 No endocervical component’ or ‘E1 Negative’.

new cancer case: A person who has a new cancer diagnosed for the first time. One person may have more than one cancer and therefore may be counted twice in **incidence** statistics if it is decided that the two cancers are not of the same origin. This decision is based on a series of principles, set out in more detail in a publication by Jensen and others (1991).

no endocervical component: Defines a cervical **cytology** test with any squamous result and an endocervical result of ‘E0 No endocervical component’. This means that no endocervical cells are present in the sample, and thus only the squamous cells in the sample can be assessed for the presence of abnormalities or cancer.

oncogenic: Cancer-causing.

oncogenic HPV: Those types of HPV that are associated with the development of cervical cancer. Currently, 15 oncogenic types of HPV are recognised. HPV types 16, 18, and 45 are most commonly associated with cervical cancer, with HPV types 16 and 18 detected in 70%–80% of cases of cervical cancer in Australia (Brotherton 2008).

Pap test: A shortened expression for Papanicolaou smear—a procedure used to detect cancer and precancerous conditions of the female genital tract, and which is the screening test of the National Cervical Screening Program. During a Pap test, cells are collected from the transformation zone of the cervix—the area where the squamous cells from the outer opening of the cervix and glandular cells from the endocervical canal meet. This is the site where most cervical abnormalities and cancers are detected. For conventional **cytology**, these cells are transferred onto a slide, and sent to a pathology laboratory for assessment. Collected cells are then examined under a microscope to look for abnormalities.

previous NCSP: The NCSP that used the Pap test as its primary screening tool, and ceased on 30 November 2017, to be replaced by the **current NCSP**.

screening: The application of a test to a population with no overt signs or symptoms of the disease in question to detect disease at a stage when treatment is more effective. The screening test is used to identify people who require further investigation to determine the presence or absence of disease, and is not primarily a diagnostic test.

The purpose of screening an asymptomatic individual is to detect early evidence of an abnormality or abnormalities, such as pre-malignant changes (for example, by **Pap test**) or early invasive malignancy (for example, by mammography), in order to recommend preventive strategies or treatment that will provide a better health outcome than if the disease were diagnosed at a later stage.

squamous abnormality (cytology): A squamous result of 'S2 Possible low-grade squamous intraepithelial lesion', 'S3 Low-grade squamous intraepithelial lesion', 'S4 Possible high-grade squamous intraepithelial lesion', 'S5 High-grade squamous intraepithelial lesion', 'S6 High-grade intraepithelial lesion with possible microinvasion/invasion' or 'S7 Squamous cell carcinoma', regardless of the corresponding endocervical result for that **cytology** test.

squamous abnormality (histology): A squamous result of 'HS02 Low-grade squamous abnormality', 'HS03.1 Cervical intraepithelial neoplasia (CIN) not otherwise specified (NOS)', 'HS03.2 CIN II', 'HS03.3 CIN III', 'HS04.1 Microinvasive squamous cell carcinoma' or 'HS04.2 Invasive squamous cell carcinoma', regardless of any endocervical result.

unsatisfactory cytology: A cervical **cytology** test where the squamous result is 'SU Unsatisfactory' and the endocervical result is 'EU Unsatisfactory', or where the squamous result is 'SU Unsatisfactory' and the endocervical result is either 'E0 No endocervical component' or 'E1 Negative'. While not a true result per se, 'unsatisfactory cytology' means that, due to the unsatisfactory nature of the cells sampled, the pathologist is unable to determine a clear result. This may be due to either too few or too many cells, or to the presence of blood or other factors obscuring the cells, or to poor staining or preservation. The absence of an endocervical component is not considered sufficient grounds to deem a cervical cytology sample unsatisfactory (NPAAC 2006).

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Related publications

Cervical screening in Australia is an annual report. This and previous *Cervical screening in Australia* reports and their supplementary data tables are available at https://www.aihw.gov.au/reports-data/health-welfare-services/cancer-screening/overview.

You may also be interested in the following related publications:

AIHW (Australian Institute of Health and Welfare) 2018. Australian Cancer Incidence and Mortality (ACIM) books: cervical cancer. Canberra: AIHW. Viewed 18 February 2019, https://www.aihw.gov.au/reports/cancer/cancer-data-in-australia/acim-books.

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Supplementary online data tables

Additional tables are available as online Excel tables at www.aihw.gov.au, under the ‘Additional material’ tab for this report. These tables contain detailed statistics for many of the tables and figures presented in summary form in both the body of the report and in Appendix A. Supplementary data tables have the prefix ‘S’ (for example, ‘Table S1.1’).

There are 7 Excel files, one for each performance indicator:

- Indicator 1 Participation
- Indicator 2 Rescreening
- Indicator 3 Cytology
- Indicator 4 Histology
- Indicator 5 Cytology–histology correlation
- Indicator 6 Incidence
- Indicator 7 Mortality.

This is the last monitoring report (to 30 June 2017) for the previous ‘Pap test-based’ National Cervical Screening Program, which ceased on 30 November 2017. For women aged 20–69, participation was estimated at 54%–56%, 7 out of every 1,000 women screened had a high-grade abnormality detected before possible progression to cervical cancer, there were 9–10 new cases per 100,000 women, and there were 2 deaths per 100,000 women.

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