

Women of Aboriginal and Torres Strait Islander descent: should we be modifying the recommended screening strategy?

Non-systematic searches were carried out of Medline, EMBASE and Cochrane Central Register of Controlled Trials from 2005 using Aboriginal and Torres Strait Islander search terms AND (HPV OR cervi*)

No studies were identified which directly compared alternative screening strategies in women of Aboriginal and Torres Strait Islander descent. The literature was searched to quantify the relative burden of cervical cancer risk cancer in women of Aboriginal and Torres Strait Islander descent compared to the general Australian female population.

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Table 1: HPV Vaccination Coverage and Impact

Author Year Country	Type of study	Objective	Population	Results
Brotherton 2013 Australia	Retrospective	Describe quadrivalent HPV vaccine coverage achieved in HPV vaccination catch-up program for girls aged 12-17 years Notified vaccine coverage by dose (1, 2 and 3) and state of residence (Australian Bureau of Statistics estimates of resident population used as denominator)	Girls aged 12-17 years as at June 2007	<ul style="list-style-type: none"> National coverage for dose 1,2, 3: 83%, 78%, 70% Highest national 3-dose coverage rate by age was achieved in 12-year-olds ACT and Victoria recorded the highest 3-dose coverage at 75% <p>Estimates of Indigenous coverage:</p> <ul style="list-style-type: none"> Queensland: <ul style="list-style-type: none"> Coverage for dose 1,2,3: 80%, 69%, 54% Coverage among Indigenous compared to non-Indigenous girls was lower with each dose; lower by 4% for dose 1, 10% for dose 2 and 15% for dose 3 NT: <ul style="list-style-type: none"> Coverage for dose 1,2,3: 76%, 71%, 64% Initial coverage was 17% lower in Indigenous girls but by dose 3 coverage was identical (84%) among those who started vaccination Local-level data and experience in the NT showed that vaccine uptake in schools with a high proportion of Indigenous boarding students was significantly lower because of difficulties returning consent forms
Smith 2015 Australia	Ecological trends	Determine whether the impact of the national HPV vaccination program on genital warts varied by Indigenous status	Hospital admissions in females involving a diagnosis of genital warts, extracted from the National Hospital Morbidity Database (AIHW). Analysis for Indigenous females used data from the period July-2004-June 2011 (July 2004-June 2007 was defined as the pre-vaccination period), and from all jurisdictions except ACT and Tasmania.	<p>Similar reductions were observed in genital warts in both young Indigenous and non-Indigenous females since the introduction of the national HPV vaccination program in Australia:</p> <ul style="list-style-type: none"> Compared with admissions rates in the last pre-vaccination period (July 2006–June 2007), admission rates in July 2010–June 2011 declined by 86.7% (95% CI, 76.0%–92.7%) in Indigenous females aged 15-24 years and by 76.1% (95% CI, 71.6%–79.9%) in non-Indigenous females aged 15-24 years. Admission rate ratios were calculated to compare the admission rates in July 2010-June 2011 to the mean admissions rate during the 3 years before program implementation (1 July 2004–30 June 2007).The admission rate ratios were very similar for Indigenous (0.22; 95% CI:0.12-0.42) and non-Indigenous (0.21; 95% CI: 0.18-0.24) females aged 15-24 years.

Table 2: HPV prevalence among Indigenous and non-Indigenous Australian women

Author Year Country	Type of study	Objective:	Population	Results
Garland 2011 Australia	Cross-sectional	Determine whether there were any differences in HPV type by area of residence or ethnicity (prior to introduction of national HPV vaccination program)	<p>2152 women aged 15-40yrs attending usual healthcare provider for routine Pap smear cytology with focus on Indigenous health providers and clinics</p> <ul style="list-style-type: none"> • 655 Indigenous, 1494 non-Indigenous, 3 unknown • all states and NT • 50% Indigenous and 6% non-Indigenous participants from remote or very remote area • Indigenous women were more likely to be younger, to smoke, to be pregnant and less likely to use hormonal contraception • Higher proportion of Indigenous than non-Indigenous were having their first Pap test and the prevalence of abnormal Pap-test results was higher 	<ul style="list-style-type: none"> • Age-adjusted prevalence of any HPV DNA (including oncogenic and non-oncogenic types) was higher for Indigenous than for non-Indigenous women when standardized to the general Australian population (47.5% versus 41.5%) but CIs overlapped • Prevalence of HPV infection was much higher in younger than older women • Prevalence of the high-risk HPV genotypes was similar for Indigenous and non-Indigenous women: <ul style="list-style-type: none"> ○ HPV 16: 9.4% vs 10.5% ○ HPV 18: 4.1% vs 3.8% and was similar for Indigenous and non-Indigenous in each age group • The 5 most common high-risk HPV were the same in both groups (16, 51, 52, 18, 39) • HPV prevalence of high-risk HPV types other than 16/18 was higher in Indigenous women aged 31-40yrs (35.0%) than in non-Indigenous women the same age (22.5%) • Prevalence of some specific high risk types varied between Indigenous and non-Indigenous women , however authors noted this could be due to a large number of comparisons being made: <ul style="list-style-type: none"> ○ HPV 68 ○ HPV 56 and 58 in remote area ○ HPV 59 in non-remote areas • Overall 55.6% of HPV-positive Indigenous and 57.6% of HPV-positive non-Indigenous had multiple types detected. Infection with multiple types was less prevalent with increasing age in both groups • In multivariate analysis, detection of any HPV genotype was strongly associated with smoking and Pap-test abnormalities, with both risk factors more common among Indigenous women • Indigenous status was not associated with HPV16/18 detection (but HPV16/18 detection was associated with smoking and hormonal contraceptive use in both univariate and multivariate analyses)

Table 3: Cervical cancer screening participation

Author Year Country	Type of study	Objective (s) of relevance	Population	Results
Binns 2006 Australia	Retrospective	Investigate the effectiveness of the Northern Territory Women's Cancer Prevention Program in improving cervical screening participation for Indigenous women	All NT resident women aged 20-69yrs who had at least one Pap smear recorded on the NT Pap Smear Registry (NTPSR) between 1997-2004 <ul style="list-style-type: none"> NTPSR does not record date on Indigenous status Indigenous participation rate estimated indirectly for the nine rural/remote areas in which Indigenous women comprise 70% or more of the female population. These nine areas encompass 55% of NT female Indigenous population Participation rate for Indigenous women calculated assuming the rate for non-Indigenous women were equivalent to those for the Australian population (61% in 2001) 	<ul style="list-style-type: none"> In 1997-1998, estimated participation for Indigenous women living in the ">70% Indigenous areas" was about half the national rate (33.9%, 95% CI: 32.6%-35.2% vs 63.9%, 95% CI: 63.8%-63.9%). In 1999-2000 participation increased to 44.0% (95%CI: 42.7%-45.4%) There was little change from 1999-2000 to 2003-2004, with Indigenous participation rates remaining 18-19 percentage points lower than national rates Participation was higher in the Top End compared with Central Australia In 2003-2004, participation varied from 22.3% to 69.4% between remote areas. The area with the greatest participation rate also had the highest proportion of Indigenous residents Participation rate for all women living in rural/remote regions were lower than those in urban areas
Whop 2014 Australia	Commentary	How well is the National Cervical screening Program is performing for Indigenous Australian women.	Indigenous Australian women	No national data on screening participation currently exists. This is in large part because pathology forms, the primary source of data for Pap Test Registers, do not include Indigenous status.
AHIW 2015	Report	Cervical screening in Australia 2012-2013	Data collected by AIHW for the Indigenous primary health-care national key performance indicators; provided by primary health-care organisations who receive funding from the Department of Health to provide services to Aboriginal and Torres Strait Islander people.	In June 2013, 31%, 37% and 43% of regular female Indigenous clients had a cervical screening test in the previous 2yrs, 3yrs and 5yrs respectively. By December 2013 this had improved to 32%, 40% and 46% respectively. However these records may not capture screening visits if clients receive screening outside their regular primary healthcare organisation. State-by-state data is available*

CI: confidence interval; * National Key Performance Indicators for Aboriginal and Torres Strait Islander primary health care: first national results June 2012 to June 2013. <http://www.aihw.gov.au/publication-detail/?id=60129546941>

Table 4: Cervical cancer incidence rate

Author Year Country	Type of study	Objective (s) of relevance	Population	Results
Zhang 2011	Retrospective	To assess data quality of cancer registrations for Indigenous Australians and produce reliable national Indigenous cancer incidence statistics	Indigenous and non-Indigenous Australians Incidence rates calculated for: <ul style="list-style-type: none"> Indigenous population: using NSW, Qld, WA and NT cancer registries; covers 84% of the Indigenous Australian population Non-Indigenous population: cases registered as non-Indigenous for whole of Australia 	<ul style="list-style-type: none"> Between 1998-2005 the age-standardised incidence rate was 2.7 times higher (95%CI 2.2-3.2) for Indigenous women (20 per 100,00) compared to non-Indigenous women (7 per 100,000) Cervical cancer incidence was found to be decreasing by 3% per year but with a very wide confidence interval (IRR 0.97 per year, 95%CI 0.83-1.13); over a longer period this possible improvement may be confirmed

CI: confidence interval; IRR: incidence rate ratio, Indigenous compared to non-Indigenous

Table 5: Incidence of cervical cancer by Indigenous status, by state/territory, 2005-2009^{(a)(b)}

State	Indigenous		Non-Indigenous		Indigenous status not stated		Rate ratio ^(d)	Rate difference ^(e)
	Number	Number per 100,000 ^(c)	Number	Number per 100,000 ^(c)	Number	%		
New South Wales	33	10.3	1067	6.0	119	9.7	1.72	4.3
Queensland	44	18.6	717	7.0	62	7.5	2.66	11.6
Western Australia	19	12.5	387	7.5	8	1.9	1.67	5.0
Northern Territory	22	22.8	34	11.0	0	0.0	2.07	11.8
Total	118	14.9	2205	6.6	189	7.5	2.26	8.3

(a) Data are reported for New South Wales, Queensland, Western Australia and the Northern Territory only. These four states and territories are considered to have adequate levels of Indigenous identification in cancer registry data for this period.

(b) Data are presented for a five-year period instead of one year because of small annual numbers for Indigenous Australians.

(c) Directly age-standardised incidence rates per 100,000, using the 2001 Australian Standard Population, by 5-year age group to 75+.

(d) Rate ratio is the incidence rate for Indigenous Australians divided by the incidence rate for non-Indigenous Australians.

(e) Rate difference is the incidence rate for Indigenous Australians minus the incidence rate for non-Indigenous Australians.

Source: Australian Cancer Database 2010, AIHW.

Table 6: Incidence of cervical cancer (age-specific rates per 100,000 population), by Indigenous status and age, Western Australia, Queensland, New South Wales and Northern Territory combined, 2005-2009^{(a)(b)(c)}

	<45	45-54	55-64	65-74	75+	Total ^(d)
Indigenous	5.8	24.8	19.1	38.4	27.7	14.9
Non-Indigenous	4.6	9.9	9.4	10.9	12.7	6.6

(a) Data are reported for New South Wales, Queensland, Western Australia and the Northern Territory only. These four states and territories are considered to have adequate levels of Indigenous identification in cancer registry data for this period.

(b) Data are presented for a five-year period instead of one year because of small annual numbers for Indigenous Australians.

(c) Age-specific rates per 100,000 using the midpoint populations for the relevant years.

(d) Rates total is directly age-standardised using the 2001 Australian Standard Population, by 5-year age group to 75+.

Source: Australian Cancer Database 2010, AIHW.

Table 7: Five-year crude survival^{(a)(b)} for cervical cancer by Indigenous status, Western Australia, Queensland, New South Wales and Northern Territory combined, 1999-2007, followed to the end of 2010^(c)

	Number ^(d)	Mean age at diagnosis (years)	Crude survival (%)	95% confidence interval (%)
Indigenous	201	46.0	51.2	44.1 to 57.9
Non-Indigenous	3845	52.8	67.2	65.7 to 68.7
Not stated	432	44.5		

(a) The 5-year crude survival rate is the percentage of people who are still alive 5 years after their cancer diagnosis. The rates were calculated by the cohort method based on all diagnoses in 1997-2007, followed to the end of 2010.

(b) The survival rates reported in this table are crude survival rates, which are not the same as and cannot be compared with the more commonly reported relative survival rates. The calculation of relative survival rates by Indigenous status would require life tables for the years 1999–2010 for NSW, Qld, WA and NT combined, stratified by Indigenous status. Such life tables were not available.

(c) Data are reported for New South Wales, Queensland, Western Australia and the Northern Territory only. These four states and territories are considered to have adequate levels of Indigenous identification in cancer registry data for this period.

(d) The number of incident cases diagnosed in 1999–2007

Source: Australian Cancer Database 2007, AIHW.

Table 8: Cervical cancer mortality per 100,000 by Indigenous status, Western Australia, South Australia, Queensland, New South Wales and Northern Territory combined, 2008-2012^{(a)(b)(c)}

Indigenous		Non-Indigenous		Not stated	Rate ratio ^(e)	Rate difference ^(f)
Number (%)	Rate per 100,000 ^(d) (95% CI)	Number (%)	Rate per 100,000 ^(d)	Number (%)		
53 (1.0)	6.5 (2.1 to 10.8)	809 (0.3)	1.9	11 (0.5)	3.4*	4.6*

CI: confidence interval

* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons at the $p < 0.05$ level.

(a) Data are reported for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only, which are considered to have adequate levels of Indigenous identification in mortality data. Data for these jurisdictions over-represent Indigenous populations in less urbanised and more remote locations, and should not be assumed to represent the experience in the other jurisdictions.

(b) Data are presented in 5-year groupings because of small numbers each year. For rate calculations, the numerator is the average of the total number of deaths and the denominator is the mid-point of the population for the time period.

(c) Although most deaths of Indigenous Australians are registered, it is likely that some are not accurately identified as Indigenous. Therefore, these statistics are likely to underestimate the Indigenous mortality rate. These data exclude 5,517 registered deaths where the Indigenous status was not stated over the period 2008-2012.

(d) Directly age-standardised using the 2001 Australian standard population, by 5-year age group up to 75+.

(e) Rate ratio is the mortality rate for Indigenous Australians divided by the mortality rate for non-Indigenous Australians.

(f) Rate difference is the mortality rate for Indigenous Australians minus the mortality rate for non-Indigenous Australians.

Source: ABS and AIHW analysis of National Mortality Database.

Table 9: Cervical cancer mortality for Indigenous women by age group (rate per 100,000 population), Western Australia, South Australia, Queensland, New South Wales and Northern Territory combined, 2008-2012^(a)

Rate per 100,000 population	Age (years)						Total
	<35	35-44	45-54	55-64	65-74	75+	
	Not published	3.9	3.7	8.5	13.9	Not published	1.8

(a) Data are reported for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only, which are considered to have adequate levels of Indigenous identification in mortality data. Data for these jurisdictions over-represent Indigenous populations in less urbanised and more remote locations, and should not be assumed to represent the experience in the other jurisdictions.

(b) Data are presented in 5-year groupings because of small numbers each year. For rate calculations, the numerator is the average of the total number of deaths and the denominator is the mid-point of the population for the time period.

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