

What Australian women want and when they want it: cervical screening testing preferences, decision-making styles and information needs

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Abstract

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Background New testing technologies and human papillomavirus (HPV) vaccines have recently brought changes to cervical cancer screening. In 2006, the Australian government also changed the protocol for managing abnormal Pap smears. Australian women's attitudes and preferences to these changes are largely unknown. Quantitative data on information needs and community attitudes to informed decision making in screening in Australia are also limited.

Objective This national study measures women's preferences for testing and management of abnormal screening results, preferred decision-making styles and information needs for cervical cancer screening.

Design A randomly selected sample of Australian women aged 18–70 participated in a structured telephone questionnaire, exploring testing preferences, information and decision-making needs.

Results A total of 1279, of 1571 eligible women, participated in the study with an overall response rate of 81.4%. Half of the women ($n = 637$) preferred having their Pap smears at least annually, and 85% wanted concurrent HPV testing. A large proportion of women preferred to be involved in decision making for both routine Pap smears (87%) and follow-up for abnormal results (89%). The majority of women wanted information on screening risks (70%) and benefits (77%); of these 81 (85%) wanted this information *before* screening. However, 63% of women only wanted information about follow-up examinations if they had an abnormal Pap test result.

Conclusion Australian women want to be involved in decision making for cervical cancer screening and require information on the risks *and* benefits of Pap testing *prior* to undergoing any screening.

Introduction

The landscape for preventing cervical cancer has changed dramatically in the past 10 years. In 2007, Australia was the first country in the world to introduce a national immunization programme for human papillomavirus (HPV). Recent trials have also suggested that HPV testing may have a role to play in both primary screening and the management of abnormal Pap results.^{1–4} The Australian guidelines for the management of abnormal Pap smears changed in July 2006 following recommendations from the National Health and Medical Research Council Cervical Screening Guidelines Review Group⁵ and have remained unchanged since then. Changes have also been made in other parts of the world, with screening delayed until 25 years of age in the UK⁶ and 21 years in the USA,⁷ and an increased screening interval for different age groups in the UK and USA.^{6,7} Despite this, little research has examined how women respond to these changes or their attitudes and preferences to new cervical screening protocols.

Research shows public attitudes to cancer screening in the USA is highly enthusiastic with preferences for maximizing sensitivity, despite the physical and emotional costs associated with over-investigation and treatment.⁸ Women have also been found to accept changes towards a 3-year screening interval if their physician endorsed this, despite an inherent reluctance to screen less often and strong enthusiasm for annual screening.⁹ In Australia, a discrete choice study recently evaluated consumers' and providers' preferences regarding alternative cervical screening protocols.¹⁰ This study showed women put relatively more weight on financial cost, false-positive rates and a recommended screening interval of 1 year.

Alongside changes in screening protocols, there are also moves towards greater informed choice in population screening programmes.^{11,12} Australian community attitudes to informed decision making, and women's information needs for cervical cancer screening, are poorly

defined. There are also little data on preferences for HPV testing as a primary or triage test, despite Australia and other nations being likely to face decisions about these new testing options in the near future.

This study is the first to investigate Australian women's cervical screening preferences, information needs and decision-making styles.

Methods

Participants

Australian women aged 18–70 eligible for cervical screening were included in this study. Women who had had a hysterectomy and women who were unable to complete a telephone survey in English were excluded.

Recruitment

Participants were recruited for the national survey conducted by the Hunter Valley Research Foundation (HVRF). The HVRF is an Australian non-profit organization specialized in general population surveys, restricted population surveys and case-control studies for clients. Australian households with a landline telephone connection were randomly selected within each of the five states and two territories of Australia from the July 2004 electronic white pages. This generated a proportional random sample of telephone numbers in each state and territory. The introduction to the survey asked how many women aged 18–70 lived in the household, and if there was more than one eligible woman, then a random respondent selection was used to minimize volunteer effects. A total of 5500 telephone numbers were selected, 5497 households were sent a letter about the survey 1–2 weeks before telephone contact was made, and three telephone numbers did not have address information. The letter included a free telephone number for women to call if they did not want the telephone interviewer to call. Potential participants who had not requested to be withdrawn were telephoned by a female interviewer

at the HVRF. The required sample size was estimated to be 1200 completed interviews. Generally, a maximum of six call attempts were made to each household to establish contact, and 1571 eligible women were identified. The remaining phone numbers were either disconnected or not residential telephone lines or did not have an eligible participant (see appendix 2).

Survey

The questionnaire was based on earlier published work^{8,13–16} and addressed preferences for cervical screening intervals, commencement of cervical screening, HPV awareness, HPV testing preferences and preferences concerning follow-up testing after receiving a minor abnormal test result (i.e. non-specific minor changes or low-grade intraepithelial lesion). The survey also addressed preferences regarding collaborative decision making with doctors using the widely used Control Preferences questionnaire¹⁷ and the provision of information about different aspects of cervical screening.¹⁴ The questionnaire took 18 min, on average, to complete. The interviews were conducted between July 2006 and August 2006.

Data collection

Semi-structured telephone interviews, using computer-aided telephone interviewing (CATI), were conducted by HVRF, who pilot tested the questionnaire. The interviews were carried out by 16 trained female interviewers. Two pilot studies of 10 interviews each were undertaken to identify problems with, and to refine, the CATI. Pilot testing allowed streamlining and simplifying the questionnaire and clarifying interviewer instructions.

Data analysis

Descriptive analyses with frequencies and cross tabulations were undertaken. The effect of age, level of education, abnormal Pap test history and usual Pap test timing on the outcomes of HPV testing preferences for primary and triage

testing and decision making were assessed using logistic regression models. Decision-making preferences were grouped into three non-ordered outcome categories and analysed using multinomial logistic regression, which models simultaneous logistic regression models for each outcome category, with its own intercept and coefficients, compared with a reference category. Likelihood ratio *P*-values were used to assess the significance of each covariate in each model. All statistical analyses were completed in SAS 9.2.¹⁸

Results

The study population

The total number of contact numbers called was 5497. From these, 1571 women were eligible for the study and 1279 (81.4%) participated (see appendix 2). Women aged 18–70 with a mean age of 46 and a median age of 44 completed the survey. The majority of respondents were born in Australia or New Zealand (1049, 82%), and half had reached TAFE or university-level education. Table 1 is a summary of the sociodemographic characteristics of the participants.

Table 1 compares our study population with the Australian population. Our sample under-represented women aged 20–29 (11%) compared with 19% in the Australian population.¹⁹ Seventy-seven percentage of participants were married or living together compared with 54% in the Australian population.¹⁹ Thirty percentage of the study participants attained a university degree (bachelor or above) compared with 18% in the Australian population. Eighty-two percentage of our sample was born in Australia or New Zealand compared with 78% in the Australian population.

Screening interval preferences

Tables 2 and 3 summarize women's self-reported screening behaviours and preferences for screening frequency. Thirty-eight percentage of women reported that their last Pap smear was between 1 and 2 years before the interview, and

Table 1 Sociodemographic characteristics of the respondents (*n* = 1279)

	Sample	Australian population (Australian Bureau of Statistics Data)	
	<i>n</i> (%)	Age (in years)	%
Age (in years) ¹			
< 20	25 (2)	15–19	9
20–29	141 (11)	20–29	19
30–39	310 (24)	30–39	21
40–49	342 (27)	40–49	21
50–59	264 (21)	50–59	18
60–70	197 (15)	60–69	12
Relationship Status ²			
Single (never married)	153 (12)	Never married	28
Married/living together	985 (77)	Married	54
Partner but not living together	14 (1)	–	–
Divorced/separated	89 (7)	Divorced	8
Widowed	38 (3)	Widowed	10
Highest level of education ³			
Primary/intermediate/school certificate	285 (22)	School education	56
Leaving certificate/HSC or equivalent	326 (25)		
TAFE	289 (23)	Diploma/Certificate	25
University	379 (30)	Bachelor or above	18
Country of Birth ¹			
Australia and New Zealand	1049 (82)	Australia and New Zealand	78
Asia	51 (4)	Asia	7
America	16 (1.6)	America	1
Europe	142 (11)	Europe	11
Africa	16 (1.6)	Africa	2
Other	5 (0.4)	Other	0.5

¹Age distribution and country of birth are based on Australian Bureau of Statistics cat 3105.0.65.001 for 2006 (<http://www.abs.gov.au>).

²Relationship status is based on Australian Bureau of Statistics cat 3105.0.65.001 for 2001 for women aged 15 or more (<http://www.abs.gov.au>).

³Highest level of education is based on Australian Bureau of Statistics cat 4230.0 for 2001 (<http://www.abs.gov.au>).

Table 2 Self-reported Pap screening behaviour *n* (%)

Reported timing of last Pap test (<i>n</i> = 1233)					
Within last year	1–2 years	2–3 years	4–5 years	6 or more years	Do not know
343 (28)	476 (38)	259 (21)	73 (6)	61 (5)	21 (1.7)
Preferred timing for routine Pap testing (<i>n</i> = 1279)					
6 monthly	Annually	2 yearly	3 yearly	5 yearly	Do not know
101 (8)	536 (42)	488 (38)	36 (3)	106 (8)	12 (1)

28% declared that their last Pap test was within the last year (Table 2). This is consistent with the most recent data from the Australian cervical screening programme, reporting a 2-year screening participation rate of 61%.²⁰ Forty-two percentage of women indicated that they

preferred screening to occur annually, and 38% preferred screening to happen 2 yearly (Table 2). When women were asked why they wanted screening annually, early detection (27%) and peace of mind (19%) were the most common reasons given (Table 3).

Table 3 Reason for preferred timing of routine Pap testing *n* (%) (*n* = 1278)

	6 monthly	Annually	2 yearly	3 yearly	5 yearly
Early detection	44 (44)	130 (27)	17 (4)	–	1 (1)
Peace of mind	28 (28)	94 (19)	11 (3)	–	–
Part of routine health check	2 (2)	50 (10)	43 (11)	–	–
High risk of cancer	20 (20)	–	6 (2)	1 (3)	–
Adequate time to detect cell changes	–	88 (18)	102 (25)	12 (33)	2 (3)
Rec. by guidelines	1 (1)	17 (3.5)	86 (22)	–	–
Negative attitude towards testing	–	12 (2.5)	70 (18)	12 (33)	91 (92)
Perceived low risk	–	4 (1)	21 (5.3)	3 (8)	4 (4)
Other	5 (5)	94 (19)	38 (9.7)	8 (23)	–

HPV testing preferences for primary and triage testing

When given brief information about HPV testing, 85% of women indicated that they would prefer to have an HPV test with their routine Pap smear as a primary screening test. Preferences for primary HPV testing with routine Pap tests were more common in older women ($P < 0.001$, Table 4) and less common in women with a previous abnormal Pap smear result (OR = 0.65, 95% CI: 0.46–0.94, $P = 0.018$) compared to women with no history of abnormal Pap smear.

Similarly, 83% of women reported that they would prefer management by HPV triage if they

had a minor abnormal Pap smear result, when this was compared with 6-month repeat Pap test.

When HPV testing was compared with the option of a 12-month repeat Pap smear as follow-up (rather than a 6-month follow-up as referred to previously), preferences for HPV testing increased to 88%.

We asked women the reasons why they did or did not want HPV testing with their routine Pap smear. The main reasons given by them were increased accuracy, early detection (50%), and health provider recommendation (13%). Reasons given for not wanting an HPV test included matters related to their sexual activity, such as not being sexually active (35%), and perceived low risk of cancer (18%).

Table 4 Women's preferences for human papillomavirus (HPV) testing with a routine Pap test¹

Characteristic	Univariate (unadjusted) models			Multivariate (adjusted) model		
	OR	95%CI	<i>P</i> -value	OR	95%CI	<i>P</i> -value
Age (in years)		< 0.0001			< 0.0001	
< 30	1.00	Reference		1.00	Reference	
30–39	2.06	0.88, 4.79		2.17	0.93, 5.09	
40–49	3.00	1.32, 6.79		3.10	1.36, 7.06	
50–59	2.72	1.18, 6.31		2.79	1.20, 6.48	
60 or more	6.22	2.72, 14.2		6.11	2.65, 14.08	
Education						
Primary School	1.00	Reference	0.095	1.00	Reference	0.266
Leaving certificate	0.88	0.59, 1.30		1.07	0.71, 1.60	
University degree	0.62	0.40, 0.98		0.77	0.48, 1.23	
Abnormal Pap Smear						
No	1.00	Reference	0.009	1.00	Reference	0.018
Yes	0.63	0.44, 0.90		0.65	0.46, 0.94	

¹Outcome 'Yes preferred HPV testing with a routine Pap test' modelled versus No.

Decision-making preferences

For routine Pap smears, 53% of women preferred an active decision-making approach (i.e. to decide themselves or to decide after considering their GPs opinion), 33% preferred sharing the decision with their GP, and 13% preferred to defer the decision to their GP (passive decision-making approach). Education was associated with decision-making preferences for routine Pap smears ($P = 0.0098$). Women with a university degree were less likely to prefer deferring their Pap smear decisions to the GP compared with women with a primary school education (OR = 0.47, 95% CI: 0.27–0.79).

Regarding follow-up of an abnormal Pap smear, 49% of women preferred an active decision-making approach, 39% preferred sharing the decision with their GP, and 11% preferred deferring the decision to their GP. Education was associated with decision-making preferences regarding follow-up of an abnormal Pap smear ($P = 0.023$). Women with a university degree were more likely to prefer an active decision-making style compared to women with a primary school education (OR = 1.46, 95% CI: 1.03–2.06) (Table 5).

Information needs and timing preferences

Most women indicated that they wanted information about aspects of cervical cancer screening including test accuracy and information on advantages and disadvantages of testing (Table 6).

The majority of women wanted to have information on test advantages (80%) and disadvantages (85%) *before* their Pap test. However, 63% wanted information about their abnormal result, follow-up and treatment only if they had an abnormal Pap test result.

We also investigated women's level of anxiety about cervical screening information, and the majority of women reported low levels of anxiety about receiving such information (Table 6).

Information sources

Ninety-three percentage of women reported relying on their GP for cervical cancer screening information. Forty-three percentage of women reported relying on family and friends for information.

Sixty-six percentage of women reported relying on the national screening programme for information (Table 7).

Discussion

Australian women prefer more frequent screening and newer technology (HPV test) for the secondary prevention of cervical cancer. Our findings indicate that they rate early detection and peace of mind as important in their reasons for these preferences. Women also indicated that they want more information and more involvement in decision making about Pap testing and the follow-up of abnormal Pap test results.

Our results also show that women would prefer to have a Pap smear annually. These findings are consistent with other studies from Australia¹⁰ and the USA⁹ showing that women prefer a screening interval of 1 year. However, women's screening preferences are inconsistent with Australian guidelines⁵ and evidence of the effectiveness of screening at a yearly interval.²¹ Such preferences for annual screening may reflect a lack of community awareness about this evidence. These preferences are also inconsistent with the women's own behaviour, with only 28% having had a Pap smear within the year and only 61% being screened 2 yearly.²⁰

There is on-going debate about the benefits and risks of introducing HPV-DNA testing into cervical cancer screening. Women in this study were advised that HPV testing can improve the accuracy of Pap testing, but the trade-off is perhaps more false positives, although our participants were not told that this was more likely in younger women (see appendix 1). Our results suggest that women want HPV testing with their routine Pap smear and as a triage test for minor cervical abnormalities. The findings indicate that women may prefer earlier resolution to any

Table 5 Women's cervical screening decision-making preferences¹

	Univariate (unadjusted) models				Multivariate (adjusted) model					
	Active decision making		Passive decision making		Active decision making		Passive decision making			
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI		
									P-value	
Women's decision-making preferences for routine Pap testing (n = 1277)										
Age (in years)										
< 30	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	0.23
30–39	0.96	0.60, 1.53	0.81	0.40, 1.62	0.96	0.60, 1.54	0.83	0.41, 1.66		
40–49	0.76	0.48, 1.20	0.70	0.35, 1.37	0.77	0.49, 1.12	0.69	0.35, 1.36		
50–59	0.68	0.42, 1.09	0.85	0.43, 1.69	0.69	0.43, 1.10	0.82	0.41, 1.64		
60 or more	0.83	0.50, 1.38	1.45	0.72, 2.93	0.86	0.52, 1.44	1.30	0.64, 2.65		
Education										
Primary school	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	0.0098
Leaving certificate	1.15	0.84, 1.60	0.72	0.47, 1.11	1.13	0.81, 1.56	0.76	0.49, 1.17		
University degree	1.19	0.84, 1.68	0.43	0.26, 0.72	1.16	0.82, 1.65	0.47	0.27, 0.79		
Abnormal Pap Smear										
No	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	0.813
Yes	1.09	0.84, 1.41	1.05	0.72, 1.53	1.09	0.84, 1.41	1.08	0.74, 1.58		
Women's decision-making preferences for follow-up and treatment of abnormal Pap test results (n = 1279)										
Age (in years)										
< 30	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	0.218
30–39	0.82	0.52, 1.28	0.79	0.39, 1.57	0.80	0.50, 1.26	0.76	0.38, 1.53		
40–49	0.69	0.44, 1.08	0.59	0.29, 1.17	0.69	0.44, 1.08	0.56	0.28, 1.12		
50–59	0.61	0.38, 0.97	0.62	0.30, 1.26	0.61	0.38, 0.98	0.59	0.29, 1.20		
60 or more	0.60	0.37, 0.98	1.03	0.51, 2.08	0.62	0.38, 1.02	0.92	0.45, 1.89		
Education										
Primary school	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	0.023
Leaving certificate	1.15	0.85, 1.57	0.69	0.44, 1.08	1.10	0.80, 1.50	0.69	0.44, 1.09		
University degree	1.53	1.09, 2.15	0.58	0.41, 1.14	1.46	1.03, 2.06	0.71	0.42, 1.19		
Abnormal Pap Smear										
No	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	0.387
Yes	0.86	0.67, 1.11	0.99	0.67, 1.46	0.85	0.66, 1.09	1.01	0.69, 1.49		

¹Outcomes (active decision making and passive decision making) versus reference group shared decision making.

Table 6 Women's cervical cancer screening information needs and preferences *n* (%)

Type of cervical screening information desired (<i>n</i> = 1279)				
	Yes	No	Do not know	
Test accuracy information	1082 (85)	188 (14)	9 (1)	
Information on advantages of testing	985 (77)	289 (22.6)	4 (0.4)	
Information on disadvantages of testing	896 (70)	370 (29)	13 (1)	
Information on what an abnormal Pap test result is	1199 (93.9)	79 (6)	1 (0.1)	
Abnormal result follow-up and treatment information	1209 (94.9)	68 (5)	1 (0.1)	
Level of anxiety about screening information (<i>n</i> = 1279)				
Level of Anxiety	No	A little/ Moderate	Very/ Extremely	Do not know
Test accuracy information (<i>n</i> = 1082)	594 (55)	416 (39)	36 (3)	36 (3)
Information on advantages of testing (<i>n</i> = 985)	735 (75)	227 (23)	14 (1.4)	7 (0.6)
Information on disadvantages of testing (<i>n</i> = 896)	505 (57)	352 (39)	15 (1.4)	24 (2.6)
Information on what an abnormal Pap test result is (<i>n</i> = 1198)	528 (44)	579 (49)	68 (6)	22 (2)
Abnormal result follow-up and treatment information (<i>n</i> = 1209)	511 (42)	603 (50)	83 (7)	11 (1)
Preferred timing to receive screening information (<i>n</i> = 1279)				
	Before Pap test	With Pap results	With abnormal results	Do not know
Test accuracy information (<i>n</i> = 1082)	527 (49)	290 (27)	257 (23)	8 (1)
Information on advantages of testing (<i>n</i> = 985)	794 (81)	101 (10)	87 (8.8)	3 (0.2)
Information disadvantages of testing (<i>n</i> = 896)	765 (85)	67 (7.5)	61 (7)	3 (0.5)
Information on what an abnormal Pap test result is (<i>n</i> = 1198)	412 (34)	215 (18)	570 (47.9)	1 (0.1)
Abnormal result follow-up and treatment information (<i>n</i> = 1209)	282 (23)	169 (13.9)	757 (63)	1 (0.1)

cervical abnormality even at the expense of increased testing and further investigation. These findings are consistent with those reported in randomized trial of HPV triage testing in which some women were given detailed information to make an information choice about HPV triage or conventional management (a repeat Pap smear). The majority of women in this study (65%) chose HPV testing indicating a strong preference for this management.¹¹

The national cervical screening programme declared that there was no enough evidence to recommend the use of HPV testing in primary screening or as a triage test for women in Australia.⁵ A large randomized trial by Ronco *et al.*²² concluded that HPV-based screening is more effective in preventing invasive cervical cancer compared with cytology alone. They found that HPV screening detects persistent

high-grade lesions earlier and provides a longer low-risk period, however, in younger women and leads to over-diagnosis of regressive CIN2. Therefore, the finding of women's willingness to have HPV testing with their routine Pap smear is interesting given that older women were more likely to be favourable to HPV testing.

Another important finding of this study is that most women preferred active involvement in cervical cancer screening decisions, although there was a trend towards this being more likely with higher levels of education. This is consistent with other research²³ that indicates a preference for a less active role in decision making by people with lower levels of literacy. It should not be assumed that being less 'involved' means women do not want to be well informed but rather that they would prefer their provider to have a more active role in screening choices.

Table 7 Sources of cervical cancer information for women *n* (%)

Reliance on cervical cancer screening information from different sources (<i>n</i> = 1279)						
	1	2	3	4	5	Do not know
GP	48 (4)	41 (3)	159 (12)	305 (24)	725 (56.9)	1 (0.1)
National screening programme	305 (24)	104 (8)	200 (16)	260 (20)	389 (30)	21 (2)
Friends and family	473 (37)	258 (20)	306 (24)	132 (10)	109 (8.9)	1 (0.1)
Other sources of cervical cancer information for women (<i>n</i> = 157)						
Medical journals/books/brochures						28 (18)
Internet						13 (8)
Newspaper/TV						26 (17)
Health professionals						57 (36)
Other						33 (21)

1 = Not at all; 5 = Very much so.

Information supporting informed decision making in cervical cancer screening is not currently available, although has been included as part of a randomized trial in Australia.¹¹

Our findings also suggest that there are unmet information needs in some aspects of cervical cancer prevention. The results show over 70% of Australian women wanted information about the accuracy of Pap testing options, their advantages and disadvantages, and most women wanted this information before their Pap test. However, many women only wanted information about the follow-up examinations recommended after an abnormal result, if they had an abnormal test result, therefore only if relevant to their test results. This is inconsistent with the UK General Medical Council guidelines²⁴ recommending that women should be given all information regarding any medical test offered including follow-up of abnormal results before they have the test.

For sources of information about Pap testing, over 80% of women relied on their GP and 66% on the national screening programme. This finding is similar to the results of Pitts and Clarke²⁵ who found that 64% of women reported the most important source of cervical screening and HPV information was their GP. Fulfilling women's information needs is considered very important, because discontent with cervical cancer screening has been previously associated with lack of information.^{26,27} As the

Internet is becoming an important source of health-care information,²⁸ this could be used to inform Australian women.

We also note that when women were asked to report their level of anxiety about cervical screening information, most of them were not anxious about receiving this information. Indeed, as women have previously been found to experience high levels of anxiety during the process of diagnosis and treatment,^{29–33} it is vital for them to receive evidence-based information before their Pap test and before the detection of a cervical abnormality.³⁴

Limitations of the study

There are some limitations to this study. In the measure of preference for HPV testing, women were given a brief description of HPV testing (as part of primary screening or as a triage test – see appendix 1) and gave their preferences based on this information. As the survey was delivered by telephone, it was not feasible to give more detailed information about the quantitative outcomes of HPV testing. However, we felt that this level of information-giving mirrors the limited information provided in current clinical practice.

Although this study was completed in 2006, there have been no substantial changes to the Australian cervical cancer screening protocol. However, it is possible that with the

introduction of the HPV vaccine, women may now be more aware of HPV and its relationship to cervical cancer aetiology. We have no evidence to suggest that there would be a significant impact of the preferences identified in this study.

Strengths of the study

This study has several strengths. This was a national survey with a large sample size and a high response rate (81.4%).

The sample is generally representative of the Australian general population, although it under-represented women aged <30 and over-represented married women. This is most likely explained by the fact that households were randomized from the telephone directory, which excludes households without a landline telephone or whose telephone numbers are not listed. This tends to exclude younger women who may change addresses more often and are more likely to have mobile telephones rather than a landline and are less likely to be married.

As such, the results are representative of planning public health interventions regarding cervical cancer screening and screening policy changes in the Australian context. To our knowledge, this study provides one of the first national surveys on women's attitudes and perceptions to real and potential future changes in the Australian cervical screening programme. It also provides important information about the kind of information women want to receive, when and where they want to receive it from and their preferences for shared/involvement in decision making.

Practice implication

Most Australian women rely on their GP for their information needs about cervical cancer prevention. They want to be actively involved in screening decisions and want more information about the benefits *and* the risks of screening options. In addition, they want this information *before* the Pap smear consultation. These findings pose real challenges to general practitioners and the National Cervical Cancer Screening Program

and will require the development of new strategies for informed choice in cervical cancer screening. Educational strategies that explore ways of informing women about cervical cancer screening benefits and risks *prior* to their consultation need to be developed and evaluated.

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Conflict of interests

None.

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Appendix 1: Information given to women about HPV test as part of this telephone survey

Human papillomavirus (HPV) is a very common virus that can cause cervical cancer and can be carried dormant (hidden) by the body for many years without causing a problem. It is transmitted during sex and in most cases is cleared by the body's immune system and causes no problem. In a small minority of women, if HPV is not

cleared by the body and is left untreated for many years, it may lead to cancer. HPV testing is a new test suggested for use in cervical screening. It checks for the presence of HPV and feels similar to having a Pap test. Having an HPV test has pros and cons. It increases the accuracy of Pap testing, but it also means that you are more likely to have follow-up examinations, tests and treatment for something that might have cleared up on its own.

Appendix 2: Number of telephone call and outcomes and response rate calculation

Definition	All numbers
Completed interview	1279
Personal or household refusal	291
Terminated /Incomplete interview	2
No answer, Engaged, answering machine	668
Unsuitable	421
Invalid number (including disconnected or business)	1342
Engaged	36
Language difficulty	134
No eligible person	1165
No responsible person at home	7
Call-back appointment with household	3
Unavailable for duration of survey	185
Total numbers used	5497
Response rate	81.4%
Sample proportions	100%
Interviews as % of sample	23%
Interview proportions	100%

The response rate is the proportion of eligible respondents contacted who completed an interview.

The following is the calculation for the response rate:

$$\text{Response Rate} = \frac{\text{Completed interviews}}{\text{Household \& Personal refusals} + \text{Completed \& Incomplete interviews}}$$

$$\text{Response Rate} = 1279 / (291 + (1279 + 2))$$

$$\text{Response Rate} = 81.4\%$$