

Reasons that clinicians in Australia offer cervical screening outside guidelines for frequency, age and co-testing

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Key points

- Around 40% of clinicians provide screening more frequently than recommended
- Some clinicians screen women at younger ages than recommended or perform HPV and cytology co-testing
- Patient request was a key reason for clinicians screening outside the guidelines

Abstract

Objectives and importance of study: Changing cancer screening programs is notoriously difficult and may be influenced by clinicians' willingness to adhere to new guidelines. Our objective was to investigate clinicians' adherence to revised cervical screening guidelines and to identify any reasons for testing outside the revised guidelines.

Methods: Australian clinicians involved in cervical screening and treating women with cervical abnormalities were invited to complete a cross-sectional online survey between September 2019 and February 2020. We measured self-reported adherence to cervical screening guidelines for three common scenarios and analysed free-text reasons for offering tests contrary to guidelines using content analysis.

Results: A total of 607 clinicians (283 general practitioners [GPs], and 324 obstetricians and gynaecologists [O&Gs]) were eligible and participated. Of these, 37.8% of GPs and 43.8% of O&Gs would provide testing more frequently than indicated by guidelines, but recognised the need for patients to be aware of the additional cost and for guidelines to be explained; 13.9% of GPs and 10.2% of O&Gs would screen women at a younger age than indicated due to patient request, patient/family history and the need for patient reassurance; and 11.4% of GPs and 23.6% of O&Gs would perform a HPV and cytology co-test when not indicated, mainly as a result of a mistake or lack of familiarity with guidelines, patient/family history and patient reassurance. Patient request for testing was a reason for testing outside the guidelines with regard to frequency of testing, age of testing and co-testing.

Conclusions: These data suggest that it is likely cervical screening outside guidelines is occurring in Australia. As patients often request these tests, strategies to reduce screening outside the guidelines should include ensuring that women are aware of the financial implications and the reasons for the updated guidelines.

Introduction

Screening programs for disease have both harms and benefits. Overdiagnosis, overtesting and consequent overtreatment have increasingly been recognised as harms over the past 10 years.^{1,2} Overtreatment can result in emotional distress and increased healthcare costs for patients. For some cervical lesions, it can also lead to an increased risk of obstetric complications.³⁻⁵ Using advances in technology and understanding of the progression of disease to modify screening programs can help ensure that the benefits of screening outweigh the harms. Benefits for women of screening less often for cervical cancer include reduced costs, less frequent invasive speculum examinations, greater convenience with fewer visits to the doctor⁶ and reduced overtreatment from unnecessary procedures. However, missing cancers is a common concern.⁷

The Australian National Cervical Screening Program has had demonstrable success in reducing cancer incidence and mortality⁸, alongside a successful human papillomavirus (HPV) vaccination program.⁹ The screening program was revised in December 2017 as a result of development of new technology and recognition of potential overtreatment in younger women.¹⁰ This revision involved reducing the frequency of testing in women (from 2-yearly to 5-yearly), implementing primary HPV screening and raising the starting age for the screening program (from 18–20 to 25 years). To ensure that the benefits of the changes are as anticipated, it is essential that clinicians support the guidelines.

Previous research conducted in the US^{11,12} and Italy¹³ suggests that some clinicians do not adhere to changes to cervical screening clinical guidelines, resulting in women being overscreened. This was particularly noticeable when screening intervals were increased. A recent systematic review found that 31–43% of clinicians reported initiating cervical screening in women aged less than 21 years, and that women aged 21–29 years often receive annual screening, which is not indicated by guidelines.¹⁴ In Alberta, Canada, of all cervical screening performed between 2011 and 2013, 17.5% of the female population aged 15–20 years and 10.3% of the female population aged over 70 years were screened contrary to the existing guidelines.¹⁵

The aim of this study was to examine Australian clinicians' adherence to the revised cervical screening guidelines and to identify any reasons for testing outside the guidelines.

Methods

Participants

Participants were a convenience sample of Australian clinicians involved in cervical screening and treating women with cervical abnormalities – that is, general

practitioners (GPs), and obstetricians and gynaecologists (O&Gs). Primary recruitment used the mailing list of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG), and advertisements in the RANZCOG and Primary Health Network newsletters. Participants were eligible to receive continuing professional development points as a result of their participation.

Procedure

Between September 2019 and February 2020, participants were directed to an online survey using the web-based platform Qualtrics. Participants accessed the participant information sheet and provided online informed consent to participate before completing an online survey of around 10 minutes duration.

Measures

The survey was developed by adapting previous work on clinician attitudes towards, and acceptance of, the revised cervical screening program before its implementation.¹⁶ As well, discussions were held with the Australian Government Department of Health, and members of the National Health and Medical Research Council Centre for Research Excellence in Cervical Cancer Control.

As part of a larger survey, participants were asked about their education and information sources for the revised guidelines; comfort with, and confidence in, aspects of the revised program; self-collection; colposcopy; and the newly created National Cancer Screening Register (data presented elsewhere¹⁷). Clinicians were also asked three questions about adherence to the guidelines: 1) If your patient asked for an additional cervical screening test that was not recommended by the guidelines, would you screen them as often as they requested? (Yes/No); 2) Have you offered screening to women under age 25 where it was not recommended in the guidelines? (Yes/No); and 3) Have you offered human papillomavirus (HPV) and cytology (a co-test) to women who did not meet the criteria in the clinical guidelines? (Yes/No). Following each item, participants who responded 'yes' were asked to give a free-text response on their reasons for performing the test. The study was approved by the University of Sydney Human Ethics Committee (2019/691).

Analysis

Analyses were carried out using SPSS v26 (IBM SPSS Inc.2019). Descriptive statistics summarised the characteristics of the sample, and the proportion and percentage of clinicians endorsing each item – overall and by job role. Respondents were categorised into O&Gs (including specialist O&Gs and O&G registrars) and GPs (including specialist GPs and GP registrars). Respondents in 'other' roles were excluded from the

analysis. Content analysis¹⁸, which is a combination of qualitative and quantitative methods, was used to analyse free-text responses to the three items. RD and HO first read through all the comments and developed a coding framework through discussion. RD and HO then independently coded all comments using the coding framework. Agreement between RD and HO using Cohen's kappa coefficient¹⁹ was indicated as 'almost perfect': 0.896 for the comments related to offering an additional cervical screening test, 0.826 for comments related to offering a co-test and 0.955 for comments related to offering a test to a woman under 25 years of age. Any discrepancies were discussed between RD and HO. Responses indicating that the participant would perform screening outside the guidelines but listing a reason indicated in the guidelines (e.g. early sexual activity, symptomatic) were removed from the content analysis. Univariate logistic regression models explored the relationships between all covariates and the use of the three additional tests. All multivariable models controlled for clinical role (GP/O&G), gender (male/female), age group (<35/36–50/51–65/66+), years of practice (<1/1–5/5–10/10–20/20+) and state/territory.

Results

A total of 648 clinicians responded to the survey. Participants not aware of changes to the screening program ($n = 3$), those who did not complete the survey ($n = 6$) and those who reported an 'other' role ($n = 32$) were excluded, leaving 607 participants included in the analyses (Table 1). Participants were O&Gs ($n = 324$; 53.4%) or GPs ($n = 283$; 46.6%). Almost 16% were specialist trainees (registrars): 12% of GPs ($n = 34/283$) and 18.8% ($n = 61/324$) of O&Gs. Fifty per cent ($n = 125/249$) of GPs who provided information on their main area of practice had a special interest in women's health (e.g. GP obstetrician).

Table 1. Sample characteristics

Characteristic	Total sample N (%)	GPs n (%)	O&Gs n (%)
Role	607 (100)	283 (46.6)	324 (53.4)
What is your main area of practice?^a			
GPs ($n = 249$)			
General GP		111 (44.6)	
Role in general practice with a women's health focus		125 (50.2)	

Characteristic	Total sample N (%)	GPs n (%)	O&Gs n (%)
'Other' area within general practice		9 (3.6)	
Missing		4 (1.6)	
O&Gs ($n = 263$)			
General obstetrics and/or gynaecology			230 (87.5)
Obstetrics and gynaecology sub-specialty ^b			29 (11.0)
Missing			4 (1.5)
Average age (years)	46.96	45.07	48.24
Years of practice as specialist			
<1		17 (6.9)	9 (3.5)
1–5		54 (21.9)	47 (18.1)
5–10		28 (11.3)	45 (17.3)
10–20		61 (24.7)	60 (23.1)
More than 20		87 (35.2)	99 (38.1)
Gender			
Male	164 (25.7)	40 (14.1)	124 (38.3)
Female	442 (72.8)	243 (85.9)	199 (61.4)
Other	1 (0.2)	0 (0)	1 (0.3)
State or territory of practice			
Australian Capital Territory	8 (1.3)	2 (0.7)	6 (1.9)
New South Wales	191 (31.5)	79 (27.9)	112 (34.6)
Northern Territory	12 (2.0)	10 (3.5)	2 (0.6)
Queensland	109 (18.0)	37 (13.1)	72 (22.2)
South Australia	52 (8.6)	26 (9.2)	26 (8.0)
Tasmania	21 (3.5)	11 (3.9)	10 (3.1)
Victoria	152 (25.0)	89 (31.4)	63 (19.6)
Western Australia	62 (10.2)	29 (10.2)	33 (10.2)
Practice setting			
Rural	6 (1.0)	5 (1.8)	1 (0.3)
Urban	595 (98.0)	276 (98.2)	319 (99.7)
Missing	6 (1.0)		

^a Question not asked of GP or O&G registrars.

^b Includes gynaecology oncology, maternal–fetal medicine, reproductive endocrinology and fertility, uro-gynaecology, and obstetric and gynaecological ultrasound.

The main area of practice for O&Gs was general obstetrics and/or gynaecology ($n = 230/263$; 87.5% of those asked this question). Participants were predominantly female ($n = 442/607$; 72.8%) and practised in urban areas ($n = 595/607$; 98.0%).

Content analysis

Screening more frequently than indicated

When asked about screening more frequently than indicated by the guidelines, just over one-third of GPs ($n = 107$; 37.8%) and just under half of O&Gs ($n = 142$; 43.8%) indicated that they would screen women as often

as they requested (Table 2; Appendix A, available from: ses.library.usyd.edu.au/handle/2123/29643).

The top three reasons both GPs and O&Gs gave for testing patients more frequently than indicated by the guidelines were the patient being aware of the additional cost and still wanting to screen (65.4% of GPs; 38.7% of O&Gs), the patient making an informed choice after clinician education about why the test is not indicated for them by the guidelines (51.4% of GPs; 27.5% of O&Gs), and managing the patient's anxiety (30.8% of GPs; 40.8% of O&Gs). These were not mutually exclusive with some clinicians listing multiple reasons.

Both GPs and O&Gs recognised that patients should be made aware that they would be charged for additional

Table 2. Most common reasons for screening women outside the guidelines

Reason	GPs agreed n (%)	O&Gs agreed n (%)
<i>If your patient asked for an additional cervical screening test that was not indicated by the guidelines, would you screen them as often as they requested? – yes</i>	107 (37.8)	142 (43.8)
Patient-related factors		
Patient aware of additional cost and still wants to screen	70 (65.4)	55 (38.7)
Patient needs education first/explain guidelines/informed choice	55 (51.4)	39 (27.5)
Manage patient anxiety/reassurance/encourage patient confidence in screening	33 (30.8)	58 (40.8)
Patient autonomy/request	17 (15.9)	33 (23.2)
Provider-related factors		
May be detrimental/acknowledge not necessary	4 (3.7)	5 (3.5)
Test not 100% accurate/not comfortable with guidelines	3 (2.8)	10 (7.0)
<i>Have you offered HPV screening to women under age 25 where it was not indicated in the guidelines? – yes</i>	39 (13.8)	33 (10.2)
Patient-related factors		
Patient autonomy/choice/request	11 (28.2)	6 (18.2)
Patient/family history of cancer or abnormalities	5 (12.8)	4 (12.1)
Had previous Pap smear	2 (5.1)	6 (18.2)
Other risk factors (e.g. immunocompromised, sexual assault)	4 (10.3)	8 (24.2)
Provider-related factors		
Accident/mistake	10 (25.6)	1 (3.0)
<i>Have you offered screening with HPV and cytology (a co-test) to women who did not meet the criteria in the cervical screening guidelines? – yes</i>	32 (11.3)	76 (23.5)
Patient-related factors		
Patient autonomy/request	6 (18.8)	16 (21.1)
Patient aware of additional cost and still wants to screen	5 (15.6)	3 (3.9)
Patient needs education first/explain guidelines/informed choice	5 (15.6)	2 (2.6)
Provider-related factors		
Accident/mistake	7 (21.9)	1 (1.3)
Early days of program/initial confusion/not familiar with new guidelines	7 (21.9)	9 (11.8)
Clinical judgement	2 (6.3)	2 (2.6)

tests outside the guidelines. Strategies used to avoid giving the patient the extra test included explaining the reasons behind the changes to the National Cervical Screening Program:

"If, after careful explanation, they still wish to have the test, and they are aware of cost, then I would screen them." (GP)

"To ease patient anxiety, only after discussion and ensuring patient aware of cost." (O&G)

Screening at an earlier age than indicated

Around 12% of clinicians reported that they had offered HPV screening to women under 25 years of age where it was not indicated by the guidelines ($n = 39$, 13.8% of GPs; ($n = 33$, 10.2% of O&Gs). The top three reasons given for screening under 25-year-olds differed between GPs and O&Gs. GPs gave patient request (28.2%), testing by accident or mistake (25.6%), or patient or family history of cancer or abnormalities (12.8%) as reasons:

"Sometimes forgot that CST [cervical screening test] not covered in those under 25 – some women would present for it, having had previous Pap tests, and I'd forget to check their age." (GP)

For O&Gs, the most frequently cited reasons were risk factors such as immunosuppression (24.2%), the woman having had a previous Pap smear (18.2%) and patient request (18.2%):

"If previously been screened by liquid-based cytology on previous system." (O&G)

Screening with additional cytology rather than just HPV ('co-test')

Just over 10% of GPs ($n = 32$; 11.3%) and 23.5% of O&Gs ($n = 76$) had offered screening with HPV and cytology to women who did not meet the criteria in the cervical screening guidelines. The top three reasons for GPs ordering a co-test were an accident or mistake (21.9%), initial confusion and lack of familiarity with the guidelines (21.9%), and patient request (18.8%):

"Initially in the program there were so many guideline arms that I thought co-test was done as a follow-up after other HPV." (GP)

Patient reassurance was the main reason given for O&Gs offering co-testing (28.9%); other reasons were patient/family history (21.1%) and patient request (21.1%):

"For example a pt [patient] with a deceased relative from cervical cancer or one with multiple previous CIN [cervical intraepithelial neoplasia] is more anxious than most women." (O&G)

Quantitative analysis

Univariate analyses showed that GPs were less likely than O&Gs to provide additional cervical screening tests (odds ratio [OR] = 0.71; 95% confidence interval [CI] 0.51, 0.98; ($p = 0.04$) or co-tests (OR = 0.28; 95% CI 0.18, 0.43; $p < 0.001$), and male clinicians were more likely than females to provide additional cervical screening tests (OR = 1.49; 95% CI 1.04, 2.13; $p = 0.03$) or co-tests (OR = 2.18; 95% CI 1.46, 3.25; $p < 0.001$). In addition, participants practising in South Australia (OR = 0.34; 95% CI 0.17, 0.67; $p = 0.002$), Western Australia (OR = 0.52; 95% CI 0.29, 0.94; $p = 0.03$) and the Northern Territory (OR = 0.22; 95% CI 0.08, 0.60; $p = 0.003$) were less likely than those practising in New South Wales (NSW) to request an additional cervical screening test. Clinicians aged 35 years and under (OR = 0.21; 95% CI 0.09, 0.48; $p < 0.001$) and 36–50 years (OR = 0.43; 95% CI 0.21, 0.86; $p = 0.02$) were less likely to order a co-test for their patient compared with their counterparts aged 66 years and over.

Two factors remained significant when entered into multivariable models (Table 3). GPs were less likely than O&Gs to provide a co-test (OR = 0.26; 95% CI 0.16, 0.45; $p < 0.001$), and participants practising in South Australia were less likely than those practising in NSW to request an additional cervical screening test (OR = 0.42; 95% CI 0.20, 0.87; $p = 0.02$).

Years of specialist practice and number of patients seen per week for GPs were not associated with requesting tests outside the guidelines.

Discussion

The findings from this study demonstrate that screening of women for cervical cancer outside the clinical guidelines is reported by clinicians to be most often driven by patient preferences or confusion around the guidelines. Our previous publication showed that more than 80% of the clinicians in this sample were comfortable with the programmatic change to screening women every 5 years, and only at age 25 years and over.¹⁷ The current study found a very small number of clinicians who stated that they did not agree with the new guidelines, supporting previous research demonstrating that Australian clinicians are generally positive about the changes²⁰, unlike in the US.^{11,21} These findings show that, despite being generally positive about the changes and feeling comfortable with the guidelines, clinicians will still offer cervical screening outside the guidelines if a patient requests it. Encouragingly, many clinicians did report that they would explain to the patient why the test would not be indicated by the guidelines before they performed the test, with more than 95% of this sample feeling confident in doing so.¹⁷

Patient request and reassurance were common reasons for screening outside the guidelines. This

Table 3 Unadjusted and adjusted odds of factors associated with requesting screening outside the guidelines

Factor	Additional cervical screening test		Patient under 25 years of age		Co-test	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
GPs (relative to O&Gs)	0.71 (0.51, 0.98) ^a	0.67 (0.45, 1.02)	0.76 (0.51, 1.13)	0.64 (0.38, 1.07)	0.28 (0.18, 0.43) ^b	0.26 (0.16, 0.45) ^b
Male (relative to female)	1.49 (1.04, 2.13) ^a	1.04 (0.66, 1.62)	0.80 (0.50, 1.27)	0.56 (0.31, 0.99) ^a	2.18 (1.46, 3.25) ^b	1.23 (0.74, 2.03)
Age (relative to 66+)						
35 years and under	0.55 (0.27, 1.12)	0.66 (0.19, 2.32)	0.63 (0.28, 1.43)	1.13 (0.25, 5.19)	0.21 (0.09, 0.48) ^b	0.60 (0.13, 2.75)
36–50 years	0.62 (0.32, 1.21)	0.56 (0.21, 1.49)	0.53 (0.25, 1.15)	0.45 (0.14, 1.44)	0.43 (0.21, 0.86) ^a	0.54 (0.19, 1.57)
51–65 years	0.80 (0.40, 1.57)	0.83 (0.39, 1.80)	0.75 (0.35, 1.62)	0.83 (0.34, 2.01)	0.52 (0.26, 1.05)	0.72 (0.32, 1.61)
No. of patients in week (relative to 80+)^c						
Less than 40	0.51 (0.23, 1.13)		0.63 (0.21, 1.87)		2.63 (0.56, 12.34)	
40–80	0.58 (0.28, 1.21)		1.14 (0.44, 2.98)		2.07 (0.46, 9.29)	
Years of specialist practice (relative to more than 20)						
Less than 1	0.87 (0.38, 1.98)	1.38 (0.46, 4.21)	0.28 (0.06, 1.23)	0.27 (0.05, 1.62)	0.48 (0.16, 1.47)	0.86 (0.20, 3.61)
1–5	0.81 (0.50, 1.32)	1.18 (0.51, 2.74)	0.96 (0.53, 1.72)	1.02 (0.36, 2.89)	0.59 (0.32, 1.08)	0.91 (0.33, 2.47)
5–10	0.91 (0.52, 1.56)	1.26 (0.57, 2.78)	0.61 (0.29, 1.26)	0.86 (0.32, 2.32)	0.89 (0.48, 1.66)	1.11 (0.44, 2.79)
10–20	0.70 (0.44, 1.11)	0.92 (0.49, 1.74)	0.93 (0.53, 1.62)	1.33 (0.64, 2.78)	1.05 (0.63, 1.76)	1.50 (0.73, 3.05)
State/territory of practice (relative to New South Wales)						
Australian Capital Territory	1.26 (0.33, 4.84)	1.12 (0.24, 5.27)	1.89 (0.45, 7.89)	1.61 (0.28, 9.36)	1.73 (0.42, 7.21)	1.83 (0.34, 9.71)
Northern Territory	0.22 (0.08, 0.60) ^a	0.46 (0.11, 1.87)	0.63 (0.21, 1.92)	1.03 (0.20, 5.38)	0.75 (0.27, 2.10)	1.65 (0.31, 8.73)
Queensland	0.86 (0.54, 1.37)	0.96 (0.57, 1.64)	0.75 (0.41, 1.38)	0.77 (0.39, 1.50)	0.98 (0.56, 1.72)	0.84 (0.44, 1.60)
South Australia	0.34 (0.17, 0.67) ^a	0.42 (0.20, 0.87) ^a	1.26 (0.62, 2.58)	0.94 (0.40, 2.19)	1.04 (0.50, 2.15)	1.24 (0.55, 2.83)
Tasmania	0.70 (0.29, 1.71)	0.74 (0.29, 1.90)	1.42 (0.52, 3.85)	1.46 (0.51, 4.20)	1.62 (0.62, 4.21)	1.94 (0.67, 5.61)
Victoria	0.79 (0.52, 1.21)	0.88 (0.54, 1.44)	1.03 (0.61, 1.72)	1.03 (0.57, 1.85)	0.98 (0.59, 1.63)	1.07 (0.59, 1.94)
Western Australia	0.52 (0.29, 0.94) ^a	0.64 (0.33, 1.24)	0.48 (0.21, 1.14)	0.58 (0.23, 1.45)	0.92 (0.46, 1.84)	1.07 (0.48, 2.36)

^a $p < 0.05$

^b $p < 0.001$

^c Only asked of GPs so not included in multivariate analyses.

supports findings from a cross-sectional survey of healthcare professionals in the US, with patient demand frequently cited as a reason for not adhering to guidelines.²² It also aligns with findings from studies before implementation of the revised National Cervical Screening Program, as many women asked whether they would be able to request more frequent screening.^{7,23} Personal experience is also influential in acceptance of guideline changes.²⁴ Clinicians' reasons for adhering to patient requests were the need to protect the patient's mental health, by reassuring women and reducing their concerns. However, focus groups conducted with women have shown that explaining the reasons behind the changes can help reassure women about the changes and may therefore reduce patient requests for additional tests.²³

In Australia, tests that are requested by women outside the guidelines are not reimbursed and must be paid for by the women themselves, referred to as 'out-of-pocket costs'. Many clinicians in this sample reported that the patient needed to be aware that there was a financial cost involved. Some of the reasons given, albeit infrequently, aligned with findings from research conducted before the changes were implemented, in which clinicians said that they would wish to continue screening from 18 years of age (as per the previous Australian Pap smear screening program) for women who had not been vaccinated for HPV, were immunosuppressed or had been victims of childhood sexual assault.¹⁶ This previous study also found that GPs are more willing than O&Gs to follow the revised guidelines, which is supported by our findings: a lower proportion of GPs than O&Gs reported performing tests not indicated by the guidelines. This may be due to O&Gs being more aware of high-risk patients who require more frequent screening.²¹ Some of the reasons given by this sample of clinicians for why they offered the test are listed in the guidelines as exceptions and therefore recommended in the guidelines (e.g. if women are symptomatic). This may suggest that clinicians at the time of this survey were still not fully familiar with the guidelines.

Previous evidence from Australia shows a lack of compliance with National Health and Medical Research Council guidelines for prevention of cervical cancer with regard to the HPV test of cure (i.e. testing after treatment), with more than 50% of women continuing to have annual Pap smears with potentially unnecessary biopsies and/or colposcopies.²⁵ In the US, overscreening is widespread, with 30–50% of healthcare professionals not following age-specific guideline recommendations for HPV testing.²¹ Although patient reassurance was given in these previous studies as a common reason for offering the tests, overscreening could inflict psychological distress if women are HPV-positive.²⁶ A positive screening result might have no clinical relevance because of the transient nature of HPV infection in younger women, and will incur unnecessary medical costs for the woman.

Understandably, some of the additional tests were during the transition period between the old and the new guidelines, and the main reason for GPs offering co-tests was accident or mistake. The complex nature of the guidelines was reported previously in a qualitative study with clinicians in Australia.²⁰ This suggests that the transition between guidelines is a critical time for educating and supporting clinicians to adhere to the new guidelines. The timing of the survey means that most of the responses for screening more frequently than recommended would have been hypothetical, but a small minority were not. Monitoring which clinicians are providing tests more frequently than every 5 years, and educating clinicians, are important to ensure that this issue is addressed.

Given the cross-sectional nature of this survey and our inability to calculate a response rate, these findings may not be generalisable to other GPs and O&Gs across Australia. We had a large number of clinicians practising in urban settings, so future research is encouraged to recruit clinicians from rural settings. The question about frequency of screening was hypothetical; some clinicians may have responded to reflect their current practice and others to the hypothetical nature of the question, so it is difficult to report whether these figures are representative. Further useful data include the number of cervical screens the clinicians conducted per month, to provide context about their experience conducting cervical screening.

Conclusions

As HPV primary screening is implemented across other countries, and screening intervals are likely to increase as a result, it has never been more important to identify and address reasons for overtesting. Cervical screening guidelines will continue to evolve as the World Health Organization strategy for elimination of cervical cancer progresses, so countries worldwide need to be able to navigate these changes. As women become more aware of guidelines, requests may subside for these additional tests. However, there may also be patient characteristics that predict overscreening, including a family or personal history of cancer or abnormalities.^{24,27} This indicates a need to ensure that clinicians are educated about the role that HPV and not family history plays in cervical cancer, to reduce overscreening in women who present with family history as a reason for additional testing. As many clinicians are comfortable with the new guidelines, targeting particularly anxious women to reduce patient requests for additional tests might be the most effective way to reduce overscreening. Where overscreening is driven by provider-related factors, practice-level electronic health records could be one strategy to alert clinicians when a cervical screening test would be of low value based on a woman's previous medical history.²⁸

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Competing interests

None declared.

Author contributions

RD and HO were responsible for conceptualization, data curation, formal analysis, investigation, methodology, project administration. RD was responsible for funding acquisition, supervision, writing of original draft and HO and KM contributed to review and editing of the manuscript.

References

1. Marmot MG, Altman DG, Cameron DA, Dewar JA, Thompson SG, Wilcox M. The benefits and harms of breast cancer screening: an independent review panel on breast cancer screening. *Br J Cancer*. 2013;108(11):2205–40.
2. Carter SM, Barratt A. What is overdiagnosis and why should we take it seriously in cancer screening? *Public Heal Res Pract*. 2017;27(3):e2731722.
3. Arbyn M, Kyrgiou M, Simoens C, Raifu AO, Koliopoulos G, Martin-Hirsch P, et al. Perinatal mortality and other severe adverse pregnancy outcomes associated with treatment of cervical intraepithelial neoplasia: meta-analysis. *BMJ*. 2008;337(7673):798–803.
4. Kyrgiou M, Athanasiou A, Kalliala I, Paraskeva M, Mitra A, Martin-Hirsch P, et al. Obstetric outcomes after conservative treatment for cervical intraepithelial lesions and early invasive disease. *Cochrane Database Syst Rev*. 2017;11(CD012847).
5. Kyrgiou M, Koliopoulos G, Martin-Hirsch P, Arbyn M, Prendiville W, Paraskeva E. Obstetric outcomes after conservative treatment for intraepithelial or early invasive cervical lesions: systematic review and meta-analysis. *Lancet*. 2006;367(9509):489–98.
6. Gerend MA, Shepherd MA, Kaltz EA, Davis WJ, Shepherd JE. Understanding women's hesitancy to undergo less frequent cervical cancer screening. *Prev Med (Baltim)*. 2017;95:96–102.
7. Obermair H, Dodd R, Jansen J, Bonner C, McCaffery KJ. "It has saved thousands of lives, so why change it?" content analysis of objections to cervical screening programme changes in Australia. *BMJ Open*. 2018;8(2):e019171.
8. Australian Institute of Health and Welfare. Cervical screening in Australia 2019. Canberra: AIHW; 2019. [cited 2021 Jun 1]. Available from: www.aihw.gov.au/reports/cancer-screening/cervical-screening-in-australia-2019/contents/table-of-contents
9. Brotherton JM, Gertig DM, May C, Chappell G, Saville M. HPV vaccine impact in Australian women: ready for an HPV-based screening program. *Med J Aust*. 2016;204(5):184.
10. Medical Services Advisory Committee. Application No. 1276 – Renewal of the national cervical screening program. Canberra: Australian Government MSAC; 2013. [cited 2021 June 1]. Available from: [www.msac.gov.au/internet/msac/publishing.nsf/Content/D924E2F768B13C4BCA25801000123B9E/\\$File/1276%20-%20Final%20MSAC%20PSD%20-%20NCSP%20Renewal.pdf](http://www.msac.gov.au/internet/msac/publishing.nsf/Content/D924E2F768B13C4BCA25801000123B9E/$File/1276%20-%20Final%20MSAC%20PSD%20-%20NCSP%20Renewal.pdf)
11. Boone E, Lewis L, Karp M. Discontent and confusion: primary care providers' opinions and understanding of current cervical cancer screening recommendations. *J Women's Heal*. 2016;25(3):255–62.
12. Min CJ, Massad LS, Dick R, Powell MA, Kuroki LM. Assessing physician adherence to guidelines for cervical cancer screening and management of abnormal screening results. *J Low Genit Tract Dis*. 2020;24(4):337–42.
13. Caglioti C, Pileggi C, Nobile CGA, Pavia M. Gynecologists and human papillomavirus DNA testing. *Eur J Cancer Prev*. 2017;26(3):249–56.
14. Tatar O, Wade K, McBride E, Thompson E, Head KJ, Perez S, et al. Are health care professionals prepared to implement human papillomavirus testing? A review of psychosocial determinants of human papillomavirus test acceptability in primary cervical cancer screening. *J Women's Heal*. 2019;29(3):390–405.
15. Symonds C, Chen W, Rose M, Cooke L. Screening with Papanicolaou tests in Alberta. Are we choosing wisely? *Can Fam Physician*. 2018;64(1):47–53.
16. Yap D, Liang X, Garland SM, Hartley S, Gorelik A, Ogilvie G, et al. Clinicians' attitude towards changes in Australian national cervical screening program. *J Clin Virol*. 2016;76:S81–7.
17. Obermair H, Bennett K, McCaffery K, Brotherton J, Smith M, Dodd R. Australian national cervical screening program renewal: attitudes and experiences of general practitioners, and obstetricians and gynaecologists. *Aust New Zeal J Obstet Gynaecol*. 2021;61(3):416–423.

18. Weber RP. Content Analysis. In: Basic Content Analysis. 2nd ed. London: Sage; 1990. p.117–124.
19. Cohen J. A coefficient of agreement for nominal scales. *Educ Psychol Meas.* 1960;20(1):37–46.
20. Dodd RH, Obermair HM, McCaffery KJ. Implementing changes to cervical screening: A qualitative study with health professionals. *Aust New Zeal J Obstet Gynaecol.* 2020;60(5):776–83.
21. Perkins RB, Anderson BL, Gorin SS, Schulkin JA. Challenges in cervical cancer prevention a survey of U.S. obstetrician-gynecologists. *Am J Prev Med.* 2013;45(2):175–81.
22. Teoh D, Marriott A, Vogel R, Marriott RT, Lais CW, Downs LS, et al. Adherence to the 2012 national cervical cancer screening guidelines: a pilot study. *Am J Obstet Gynecol.* 2015;212(1):62.e1–62.e9.
23. Dodd R, Nickel B, Wortley S, Bonner C, Hersch J, McCaffery K. Examining the information needed for acceptance of deintensified screening programmes: qualitative focus groups about cervical screening in Australia. *BMJ Open.* 2019;9:e029319.
24. Obermair HM, McCaffery KJ, Dodd RH. “A Pap smear saved my life”: Personal experiences of cervical abnormalities shape attitudes to cervical screening renewal. *J Med Screen.* 2020;27(4):223–6.
25. Munro A, Spilsbury K, Leung Y, O’Leary P, Williams V, Codde J, et al. The human papillomavirus test of cure: a lesson on compliance with the NHMRC guidelines on screening to prevent cervical cancer. *Aust New Zeal J Obstet Gynaecol.* 2015;55(2):185–90.
26. Dodd RH, Mac O, Brotherton JML, Cvejic E, McCaffery KJ. Levels of anxiety and distress following receipt of positive screening tests in Australia’s HPV-based cervical screening programme: A cross-sectional survey. *Sex Transm Infect.* 2020;96(3):166–72.
27. Sirovich B, Woloshin S, Schwartz L. Screening for cervical cancer: will women accept less? *Am J Med.* 2005;118:151–8.
28. Mathias JS, Gossett D, Baker DW. Use of electronic health record data to evaluate overuse of cervical cancer screening. *J Am Med Informatics Assoc.* 2012;19(E1):96–101.