

## SHORT REPORT

## Awareness of human papillomavirus among women attending a well woman clinic

J Waller, K McCaffery, S Forrest, A Szarewski, L Cadman, J Wardle

*Sex Transm Infect* 2003;**79**:320–322

**Objectives:** To assess the level and accuracy of public understanding of human papillomavirus (HPV) in the United Kingdom.

**Methods:** Women attending a well woman clinic were asked to complete a questionnaire assessing HPV awareness and specific knowledge about the virus.

**Results:** Questionnaires were completed by 1032 women, of whom 30% had heard of HPV. Older women, non-smokers, and those with a history of candida, genital warts, or an abnormal smear result were more likely to have heard of HPV. Even among those who had heard of HPV, knowledge was generally poor, and fewer than half were aware of the link with cervical cancer. There was also confusion about whether condoms or oral contraceptives could protect against HPV infection.

**Conclusions:** In this relatively well educated sample, awareness and knowledge of HPV were poor. Public education is urgently needed so that women participating in cervical cancer screening are fully informed about the meaning of their results, especially if HPV testing is soon to be introduced.

Human papillomavirus (HPV) is widely acknowledged to be the most prevalent sexually transmitted infection (STI) in the United States<sup>1</sup> and elsewhere. High risk types of HPV are a necessary though not sufficient cause of the vast majority of cervical cancers.<sup>2</sup> In the United States, HPV testing is recommended for the triage of women with borderline smear results.<sup>3</sup> A similar system is being considered in the United Kingdom, and HPV testing in primary screening has also been suggested.<sup>4</sup>

Studies in the United States have found low awareness of HPV among women in university and healthcare settings.<sup>5–9</sup> In the United Kingdom, 70% of female university employees surveyed had never heard of the virus<sup>10</sup> and in a representative population sample, fewer than 1% recalled HPV as a risk factor for cervical cancer (unpublished data).

It is critical that women participating in cervical screening are aware of HPV and its causal role in cervical intraepithelial neoplasia (CIN) and cancer. Information about HPV has been found to cause confusion among women with no prior knowledge of the virus or its link with cervical cancer<sup>11</sup> and smear results which mention “wart virus” are poorly understood.<sup>12</sup>

We assessed HPV knowledge among women attending a well woman clinic to gain an understanding of the level and accuracy of public awareness.

**METHODS****Participants**

Participants were women attending the Margaret Pyke Centre, an NHS well woman clinic in central London. Speaking English was the only inclusion criterion. Participants’

reasons for attending the centre are shown in table 1 and are broadly representative of the clinic as a whole.

**Measures**

Knowledge of HPV was measured using a series of questions similar to those used in other studies.<sup>6–10</sup> Women who reported having heard of HPV were asked how they had heard about it. They also responded to six statements about HPV with “true,” “false,” or “don’t know” (see table 2).

Demographic characteristics and STI and cervical screening history were also assessed with simple questions.

**Procedure**

Women attending the centre over 15 months between 2000 and 2002 were asked to complete a survey about cervical screening and HPV self sampling. Selected clinic sessions were targeted each week to ensure that women attending for different reasons were included. Those attending for smear tests were invited to participate in a trial of HPV self testing, the results of which will be presented elsewhere. The study was approved by the University College London Hospitals local research ethics committee.

**RESULTS****Characteristics of the sample**

The response rate was high, with approximately 80% of women who were asked agreeing to complete a questionnaire. Those who declined mostly did so because of time constraints. Of the 1045 women completing the questionnaire, 13 did not respond to the question about having heard of HPV and are excluded from all analyses, leaving a sample size of 1032. Participants were representative of the clinic population being predominantly young (mean age 30.2 (SD 7.7)), white, well educated, and in full time employment (see table 1). Equal numbers of women were married/cohabiting (47%) and single (47%). Most reported having had between one and three sexual partners in the past year and 27% reported a previous diagnosis of an STI.

**HPV knowledge**

About 30% of women (316/1032) had heard of HPV. There were significant, but generally small associations with demographic characteristics (see table 1). Awareness of HPV was higher in older (47%) than younger women (25%). Women reporting a history of candida or genital warts had higher awareness of HPV, as did those who reported ever having an abnormal smear result. Not surprisingly, knowing someone who had had HPV was associated with greater awareness. Awareness was lower among smokers (22%) than non-smokers (35%). When the significant predictors were entered into a logistic regression model (see table 1), all remained significant independent predictors of awareness of HPV except experience of an abnormal smear result.

Even among women who had heard of HPV (n=316), knowledge was poor (see table 2). They generally knew that HPV was sexually transmitted and could be carried by men,

**Table 1** Characteristics of the whole sample (n=1032) and women who were aware (n=316) and unaware (n=716) of HPV, with  $\chi^2$  tests for between group differences and odds ratios for significant predictors

	Whole sample (n=1032)		Women aware of HPV (n=316)		Women unaware of HPV (n=716)		Difference between groups $\chi^2$ [df] (p)	Odds ratio of having heard of HPV [95% CI]
	%	No	%	No	%	No		
Age (years)								
16–25	30.0	310	24.7	78	32.4	232		1.00
26–35	47.9	494	47.2	149	48.2	345	13.3 [3] (0.004)	1.19 [0.82 to 1.74]
36–45	15.6	161	17.7	56	14.7	105		1.20 [0.72 to 1.98]
46 and over	5.5	57	8.5	27	4.2	30		2.40 [1.23 to 4.68]
Age of leaving full time education								
16 and under	8.1	84	6.6	21	8.8	63		
17–18	15.7	162	13.9	44	16.5	118	NS	
19 and over	74.0	764	78.2	247	72.2	517		
Still in full time education and under 19	0.6	6	0	0	0.8	6		
Ethnicity								
White	83.7	864	83.9	265	83.7	599		
Black	3.4	35	2.8	9	3.6	26	NS	
Asian	4.5	46	4.1	13	4.6	33		
Other	5.5	57	4.7	15	5.9	42		
Housing tenure								
Rent from local authority	5.7	59	4.4	14	6.3	45		
Rent from private landlord	47.4	489	49.4	156	46.5	333	NS	
Own/buying home	35.0	361	36.7	116	34.2	245		
Live with parents	4.5	46	2.8	9	5.2	37		
Other	6.2	64	5.7	18	6.4	46		
Marital status								
Married/living with partner	47.1	486	48.1	152	46.6	334		
Single	47.4	489	46.2	146	47.9	343	NS	
Separated/divorced/widowed	4.4	45	4.1	13	4.5	32		
Work status								
Working full time	73.2	755	75.3	238	72.2	517		
Working part time	9.2	95	7.6	24	9.9	71	NS	
Not working at present	6.4	66	6.6	21	6.3	45		
Student	10.0	103	9.5	30	10.2	73		
Do you smoke cigarettes? (yes)	34.3	354	25.0	79	38.4	275	17.0 [1] (<0.0001)	0.52 [0.36 to 0.74]
Number of sexual partners in the last year								
None	4.1	42	3.5	11	4.3	31		
1	65.8	679	65.8	208	65.8	471	NS	
2–3	22.4	231	22.5	71	22.3	160		
4 or more	6.2	64	6.6	21	6.0	43		
STI history								
Candida (thrush)	51.4	530	59.5	188	47.8	342	15.3 [1] (<0.0001)	1.47 [1.06 to 2.03]
Genital warts	10.1	104	18.0	57	6.6	47	33.8 [1] (<0.0001)	2.37 [1.41 to 3.56]
Other STI*	20.5	212	23.7	75	19.1	137	NS	
Previous abnormal smear result (yes)	26.4	272	35.1	111	22.5	161	17.9 [1] (<0.0001)	1.28 [0.88 to 1.85]
Know someone who has had HPV (yes)	8.7	90	23.7	75	2.1	15	114.2 [1] (<0.0001)	11.80 [6.47 to 21.54]
Reason for attending clinic								
Smear test	32.7	337	33.2	105	32.4	232		
Smear test and contraceptive advice	11.5	119	15.2	48	9.9	71	NS	
Contraceptive advice	46.8	483	45.6	144	47.3	339		
Colposcopy	2.8	29	2.2	7	3.1	221		

\*Herpes simplex, *Trichomonas vaginalis*, chlamydia, gonorrhoea, anaerobic vaginosis, pelvic inflammatory disease, non-specific urethritis.

but fewer than half knew that it is the main cause of cervical cancer, and only a third knew that genital warts do *not* cause cervical cancer. The majority believed condoms to be protective and, worryingly, only half knew that the contraceptive pill does not protect against HPV infection. The most common sources of information were the media or a general practitioner. Women who had heard about it from an “other” source cited a wide variety including pamphlets, sexual health classes, through having had HPV in the past, or having a medical background.

## DISCUSSION

This is the first study to evaluate HPV knowledge among women in a primary healthcare setting in the United Kingdom. In this predominantly young and sexually active population, only 30% reported awareness of HPV, and knowledge was generally poor even among those who had heard of it, consistent with the findings of previous US and UK studies.<sup>5–9</sup> Given that the sample was highly educated, and there was some evidence of a trend towards poorer knowledge

among less educated women, it is likely that knowledge in the general population is even lower. However, the age effect would be in the opposite direction, as the sample was skewed towards younger women who had lower awareness.

Awareness of HPV was associated with experience of candida, genital warts, or an abnormal smear, indicating that attending for treatment for these might expose women to information about HPV. Knowing someone who has had HPV was another predictor of awareness, although women generally cited the media or their general practitioner as sources of knowledge.

Awareness was lower among smokers, which is of concern as smoking increases the risk of cervical abnormalities and cancer among women with HPV infection. Raising awareness of the virus and the role of cigarette smoking in viral persistence and CIN progression among smokers should be a priority.

Women’s uncertainty about whether the pill protects against HPV partly reflects their lack of knowledge about the sexually transmitted nature of the virus. Of those who knew

**Table 2** HPV knowledge among those who had heard of it (n=316 out of total sample of 1032)

	%	No
How did you hear about it?		
GP	18.7	59
Friend or family member	13.9	44
Internet	2.2	7
TV/magazine/newspaper	38.3	121
Other	23.4	74
HPV sexually transmitted (true)		
True	64.9	205
False	7.3	23
Not sure	25.3	80
HPV main cause of cervical cancer (true)		
True	40.2	127
False	15.2	48
Not sure	42.7	135
Men can carry HPV (true)		
True	63.9	202
False	3.8	12
Not sure	29.7	94
Genital warts cause cervical cancer (false)		
True	24.1	76
False	34.2	108
Not sure	38.9	123
The pill protects against HPV (false)		
True	7.0	22
False	55.1	174
Not sure	34.8	120
Condoms protect against HPV (uncertain)		
True	66.5	210
False	9.5	30
Not sure	20.6	65

that HPV is sexually transmitted, 70% were aware that the pill is not protective, compared with only 32% of those who did not know or were not sure that HPV is an STI. It is also possible that the protective role of the pill in other gynaecological cancers might have influenced women's beliefs about its impact on HPV risk.

The majority of women believed that condoms are protective against HPV, although the evidence for this is unclear. It seems likely that condoms provide some protection,<sup>13</sup> but the message about condom use will need to be clarified so that women can be given consistent information.

Caution must be exercised when drawing conclusions beyond our sample, as it was not representative of the UK population, being younger, better educated, and more predominantly white. However, low HPV awareness was consistent with other studies, which lends credence to this finding.

Public education about HPV is essential, in order that women participating in cervical screening understand the possible results of the smear test, particularly if HPV testing is

introduced. Clear and consistent messages about HPV transmission, cancer risk, and protection must be developed in order that women are fully informed when they participate in cervical screening.

## ACKNOWLEDGEMENTS

This study was funded by Cancer Research UK. We would also like to thank the staff and patients at the Margaret Pyke Centre for their time and cooperation in the study.

## CONTRIBUTORS

AS, JaW, and LC conceived the study and obtained funding; KM and SF designed the measures and conducted the fieldwork; JoW contributed to the field work, carried out the data analysis and wrote the first draft of the text; all authors commented on drafts and contributed to the final manuscript.

## Authors' affiliations

**J Waller, K McCaffery, S Forrest, J Wardle**, Cancer Research UK Health Behaviour Unit, Department of Epidemiology and Public Health, UCL, 2-16 Torrington Place, London WC1E 6BT, UK  
**A Szarewski, L Cadman**, Department of Mathematics, Statistics and Epidemiology, Cancer Research UK, 61 Lincoln's Inn Fields, London WC2A 3PX, UK  
**K McCaffery**, Screening and Test Evaluation Program, School of Public Health, University of Sydney, NSW 2006, Australia

Correspondence to: Jo Waller, CRUK Health Behaviour Unit, Department of Epidemiology & Public Health, UCL, 2-16 Torrington Place, London WC1E 6BT, UK; [j.waller@public-health.ucl.ac.uk](mailto:j.waller@public-health.ucl.ac.uk)

Accepted for publication 13 February 2003

## REFERENCES

- Carr J, Gyorfí T. Human papillomavirus. Epidemiology, transmission, and pathogenesis. *Clin Lab Med* 2000;**20**:235-55.
- Bosch FX, Lorincz A, Munoz N, et al. The causal relation between human papillomavirus and cervical cancer. *J Clin Pathol* 2002;**55**:244-65.
- Wright TC Jr, Cox JT, Massad LS, et al. 2001 Consensus guidelines for the management of women with cervical cytological abnormalities. *JAMA* 2002;**287**:2120-9.
- Sasieni P, Cuzick J. Could HPV testing become the sole primary cervical screening test? *J Med Screen* 2002;**9**:49-51.
- Baer H, Allen S, Braun L. Knowledge of human papillomavirus infection among young adult men and women: implications for health education and research. *J Commun Health* 2000;**25**:67-78.
- Dell DL, Chen H, Ahmad F, et al. Knowledge about human papillomavirus among adolescents. *Obstet Gynecol* 2000;**96**:653-6.
- Lambert EC. College students' knowledge of human papillomavirus and effectiveness of a brief educational intervention. *J Am Board Fam Pract* 2001;**14**:178-83.
- Mays RM, Zimet GD, Winston Y, et al. Human papillomavirus, genital warts, Pap smears, and cervical cancer: knowledge and beliefs of adolescent and adult women. *Health Care Women Int* 2000;**21**:361-74.
- Yacobi E, Tennant C, Ferrante J, et al. University students' knowledge and awareness of HPV. *Prev Med* 1999;**28**:535-41.
- Pitts M, Clarke T. Human papillomavirus infections and risks of cervical cancer: what do women know? *Health Educ Res* 2002;**17**:706-14.
- McCaffery KJ, Forrest S, Waller J, et al. Attitudes towards HPV testing: a qualitative study of beliefs among Indian, Pakistani, African Caribbean and white British women in the UK. *Br J Cancer* 2003;**88**:42-6.
- Kavanagh AM, Broom DH. Women's understanding of abnormal cervical smear test results: a qualitative interview study. *BMJ* 1997;**314**:1388-91.
- Manhart LE, Koutsky LA. Do condoms prevent genital HPV infection, external genital warts, or cervical neoplasia? A meta-analysis. *Sex Transm Dis* 2002;**29**:725-35.



## Awareness of human papillomavirus among women attending a well woman clinic

J Waller, K McCaffery, S Forrest, et al.

*Sex Transm Infect* 2003 79: 320-322

doi: 10.1136/sti.79.4.320

---

Updated information and services can be found at:

<http://sti.bmj.com/content/79/4/320.full.html>

---

*These include:*

### References

This article cites 13 articles, 5 of which can be accessed free at:

<http://sti.bmj.com/content/79/4/320.full.html#ref-list-1>

Article cited in:

<http://sti.bmj.com/content/79/4/320.full.html#related-urls>

### Open Access

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 3.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/3.0/>

### Email alerting service

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

---

To request permissions go to:

<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:

<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:

<http://group.bmj.com/subscribe/>

## Topic Collections

Articles on similar topics can be found in the following collections

[Open access](#) (163 articles)  
[Cervical cancer](#) (118 articles)  
[Gynecological cancer](#) (140 articles)  
[Vulvovaginal disorders](#) (411 articles)  
[Cervical screening](#) (77 articles)  
[Screening \(oncology\)](#) (102 articles)  
[Condoms](#) (680 articles)  
[Contraception](#) (214 articles)  
[Dermatology](#) (214 articles)  
[Drugs: obstetrics and gynaecology](#) (129 articles)  
[Other viral STIs](#) (133 articles)  
[Reproductive medicine](#) (1197 articles)  
[Screening \(epidemiology\)](#) (862 articles)  
[Screening \(public health\)](#) (862 articles)

---

## Notes

---

To request permissions go to:

<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:

<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:

<http://group.bmj.com/subscribe/>