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Future acceptance of adolescent human papillomavirus vaccination: A survey of parental attitudes

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Abstract

The main target group for vaccination against human papillomavirus (HPV), the sexually transmitted virus that causes cervical cancer, will be young adolescents. We undertook a population-based survey to assess parental consent and potential HPV vaccine uptake in eight secondary schools using stratified randomisation according to school type and ethnicity. Our results suggest that in socially and ethnically mixed populations such as Manchester, an HPV vaccine uptake rate of 80% may be achievable if the vaccine is perceived to be safe and effective. However, most parents lack knowledge about HPV and some are concerned about sexual health issues that would arise as part of a HPV vaccine programme. It will be important to raise general awareness of the role of HPV in cervical cancer without stigmatizing the vaccine.

Keywords: Human papillomavirus vaccines; Adolescents; Parental attitudes

1. Introduction

Soon to be licensed are vaccines against human papillomavirus (HPV), a ubiquitous sexually transmitted virus that causes cervical cancer [1,2]. Randomised clinical trials have demonstrated their immunogenicity and short-term effectiveness in preventing incident and persistent type-specific HPV infections, as well as cytological abnormalities [3,4]. The main target group for HPV vaccination will be young adolescent girls (and possibly boys) and the accepted strategy would be to vaccinate prior to onset of sexual activity. It is not yet known how the general public will view vaccinating (pre)-pubescent adolescents against HPV. In the wake of scares about measles–mumps and rubella (MMR) vaccines, parents are more cautious about vaccine safety and are less trusting of scientific evidence [5–7]. Many women do not know that cervical cancer is linked to sex and may be shocked to discover that it is caused by a sexually transmitted infection (STI) [8]. Linking cervical cancer to a potentially stigmatising STI risks a negative impact on vaccine uptake and there is scope for anxiety that vaccination could encourage promiscuity [9]. Conversely, the vaccine could provide a key opportunity for increasing awareness of STIs and their prevention among young people, leading to wider sexual health benefits.

There have been no studies to assess the climate for HPV vaccines in the UK. The objectives, therefore, of this study were to assess perceptions and attitudes to HPV vaccination as determinants of acceptance of HPV policies among a representative sample of parents of young adolescents living in the city of Manchester.

2. Materials and methods

2.1. Sample

The study was designed to sample randomly parents of year 7 (age 11–12) pupils in the city of Manchester. Based

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on data from Manchester City Council's Education Department, all the 26 community, voluntary-aided and independent schools were stratified into eight strata according to school type and ethnicity. Using a purpose-written computer program, one school was randomly selected from each stratum, with alternative second and third choice schools available in the event of refusals. This gave a potential sample of between 1300 and 1900 pupils and allowed sampling across all school types. The alternative of sampling within schools was rejected because the required sampling frame was not available. With an anticipated response rate of 30%, this sample size enabled quantification of a 5% proportion holding a minority view with a 95% confidence interval width of ±2%.

2.2. Data collection

A questionnaire was drafted following two focus group discussions with primary school parents, and was refined over three rounds of validation. Questions were formulated to explore the vaccine policy decisions that formed the main outcome indicators for the study: agreement to vaccination (Likert scale), information to accompany school vaccination (6 yes/no questions), agreement with universal vaccination (Likert scale), involving the child in the decision to vaccinate (yes/no) and provision of the vaccine at sexual health clinics independent of parental consent (Likert scale). Information was also collected on social and demographic background, attitudes towards STIs and current knowledge of HPV and cervical cancer. As it was apparent that knowledge was limited, 11 facts were provided (Box 1) and parents asked how many they knew prior to receiving the questionnaire. The University of Manchester Committee on the Ethics of Research on Human Beings approved the study and final questionnaire.

Two schools refused to participate. One could not be replaced because it was the only school of its type in the voluntary-aided non-christian stratum, which left seven schools in the sample. Between March and April 2005 questionnaires, background information and pre-stamped envelopes for return posting, were mailed by school staff to Year 7 parents. This arrangement maintained parent anonymity as mandated by the Ethics Committee. Follow-up of non-responders accordingly relied on general reminders to parents by the schools.

2.3. Data analysis

From data made available by the Education Department on ethnic composition, entitlement to free school meals and pupil gender in Manchester for January 2005, response rates were inferred for ethnic and gender groups, and weights obtained to estimate population frequencies. For Independent schools, pupil numbers were based on data from the UK Department for Education and Skills. In these schools, for weighting purposes the sex ratio of mixed schools was assumed to be 50:50 and ethnic distribution was taken from the sample. Allowing for the survey structure plus post-stratification on school strata and ethnicity, estimates of the population proportions and their standard errors were calculated to adjust for differential sampling and response using the "survey" package in the statistical program R [10,11]. To test for associations between vaccine acceptability and responder characteristics, proportional odds ordinal regression models were applied adjusting for the sample stratification. The "no" and "probably not" categories were pooled for this analysis.

Parental beliefs and attitudes in relation to all vaccine policy outcomes were similarly explored by ordinal regression, using a proportional-odds model. A simplified "information desired" outcome variable was collated using the number of information items requested, and grouped as low (0–3), "medium" (4–5) and "high" (all six items selected). For this analysis six respondents were excluded on account of missing data and the number of variables in the model was reduced by amalgamating similar questions based on subject knowledge and exploratory principal components factor analysis and cluster analyses. Five questions loaded onto multiple factors, indicating that they explored multiple issues and were excluded. One question (whether parents thought vaccination would encourage sexual activity) was considered an independent factor. For grouped data a simple average response was computed, weighted by the length of the scale.

Box 1: Facts about HPV and cervical cancer

(a) HPV is a virus in the genital area that is sexually transmitted.
(b) HPV is very common.
(c) Both men and women get infected, and pass the virus to partners.
(d) Adolescents are likely to get infected once they start having sex.
(e) Most HPV infections have no symptoms and last 6–24 months.
(f) There is no treatment for HPV infection.
(g) In women, if the virus persists, it causes an abnormal cervical smear.
(h) Other factors, like smoking, increase the risk of the virus persisting.
(i) Over 95% of cervical cancer is due to persistent HPV infection.
(j) About 2000 new cases of cervical cancer are diagnosed each year.
(k) Vaccination against HPV will prevent cervical cancer.

These facts were provided to parents at the start of the questionnaire.

3. Results

Three hundred and seventeen questionnaires were returned with an overall response rate of 22% (Table 1). There was a higher response rate from black parents and a somewhat lower response rate from Indian and some other ethnic groups. The response rate of parents of children in receipt of free school meals was proportional for community and voluntary assisted schools, after excluding the independent school where only one respondent qualified for free school meals. Few parents, irrespective of background, had heard about HPV or the vaccine: 60% had no prior knowledge and only 11% were well informed (knew 7–11 facts). After adjusting for the survey design and response rates an estimated 81% indicated they would agree to their child's vaccination, but only 38% were definite about this decision (Table 2). Sociodemographic characteristics were not statistically associated with vaccine acceptance (Table 3). Parents who discussed the questionnaire with their child (44.4; S.E. 4.3%) were more likely to support vaccination than those who did not (OR 1.52: 95% CI 0.98–2.35; $p = 0.058$).

With regard to other aspects of vaccine policy (Table 4), 6% disagreed with vaccinating before onset of sexual activity, and a similar number responded "never" to the question about vaccination age, indicating a resistant group who would not allow their child to be vaccinated at any age. Vaccination in early adolescence was generally accepted, although in a separate question, 9 (2.1)% indicated that the vaccine should not be given to young adolescents because it would encourage promiscuity. Most parents agreed with universal vaccination (Table 4). In a separate question 84 (2.7)% stated that all boys should be vaccinated and less than 4% agreed with selectively giving the vaccine to adolescents having a lot of sexual partners or a family history of cervical cancer. Most parents favoured a joint decision with their child on whether to have the vaccine, but 19% would not take the child's view into consideration (Table 4). Although 42% agreed that the child should be able to request vaccination without parental consent, 48% were opposed to this suggestion. Giving children

Table 2
Estimates of the percentage of responders who would agree to HPV vaccination for their child

Response	Sample % (S.E.)	Population estimate % (S.E.)
No	5.0 (1.2)	4.1 (1.4)
Probably not	3.5 (1.0)	3.3 (1.4)
Do not know	16.1 (2.1)	11.6 (2.2)
Probably	43.2 (2.8)	43.4 (4.6)
Yes	32.2 (2.6)	37.5 (4.7)

Table 1
Composition of the population, sample and distribution of questionnaires returned

Sample characteristics	No. in Manchester schools	No. in sampled schools	No. questionnaires returned	% questionnaires returned
Total	4788	1427	317	22.2
School strata				
Community 1[a]	648	149	24	16.1
Community 2	836	352	65	18.5
Community 3	975	198	26	13.1
Community 4	697	286	68	23.8
VA[*] Anglican	242	242	72	29.8
VA Catholic	933	126	16	12.7
Independent[b]	457	74	46	62.2
Ethnicity				
White	3071	744	207	27.8
Black-Caribbean	124	70	25	35.9
Black-African	240	98	28	28.6
Indian	707	242	39	16.1
Others[**]	646	273	13	4.8
No response	0	0	5	
Gender of child				
Male	2375	491	84	17.1
Female	2413	936	227	24.3
No response	0	0	6	
Eligible for free school meals				
No	2802	836	224	26.8
Yes	1986	591	85	14.4
No response	0	0	8	

[a] Community schools are funded by local government and have no selective academic entry criteria.
[b] Independent schools are fee-paying and select pupils by entrance exam.
[*] Voluntary-aided schools are non fee-paying, linked to religious organizations and decide their own admissions policy.
[**] For example: non-Indian Asian, Arabic.

Table 3
Association between child and responder characteristics and probability of consenting to HPV vaccination

Will consent to HPV vaccination									
Characteristic	Group	No	Estimate of population percentages				Ordinal regression		
			Probably no (S.E.)	Do not know (S.E.)	Probably (S.E.)	Yes (S.E.)	OR	CI	*P*
Ethnicity	White	207	5.3 (1.6)	13.5 (2.4)	47.8 (3.5)	33.3 (3.2)	1		
	Black Car[a]	25	8.0 (5.4)	36.0 (9.6)	32.0 (9.4)	24.0 (8.6)	0.58	0.25–1.31	
	Black-Afr[b]	28	21.4 (7.8)	7.1 (4.9)	32.1 (8.8)	39.3 (9.2)	1.02	0.45–2.35	0.73
	Indian	39	15.4 (5.8)	17.9 (6.2)	35.9 (7.7)	30.8 (7.4)	0.79	0.38–1.64	
	Others	13	15.4 (10.1)	0.0 (0.0)	53.8 (13.9)	30.8 (12.8)	1.12	0.39–3.19	
No. of other children in family	0	29	10.3 (5.7)	13.8 (6.4)	58.6 (9.1)	17.2 (7.0)	1		
	1	87	6.9 (2.7)	18.4 (4.1)	46.0 (5.3)	28.7 (4.9)	1.34	0.62–2.91	
	2	101	8.9 (2.8)	12.9 (3.4)	44.6 (5.0)	33.7 (4.7)	1.51	0.71–3.22	0.12
	3	51	15.7 (5.1)	17.6 (5.3)	33.3 (6.6)	33.3 (6.6)	1.10	0.47–2.59	
	>3	41	2.4 (2.4)	9.8 (4.7)	43.9 (7.8)	43.9 (7.8)	2.81	0.15–6.89	
Age of respondent	≤30	24	0.0 (0.0)	8.3 (5.7)	41.7 (10.1)	50.0 (10.3)	1		
	31–35	65	7.7 (3.2)	18.5 (4.7)	41.5 (6.1)	32.3 (5.8)	0.33	0.13–0.82	
	36–40	75	13.3 (3.9)	10.7 (3.5)	44.0 (5.8)	32.0 (5.4)	0.37	0.15–0.91	0.17
	41–45	94	11.7 (3.3)	14.9 (3.7)	39.4 (5.0)	34.0 (4.9)	0.45	0.19–1.10	
	>45	48	2.1 (2.1)	18.8 (5.6)	58.3 (7.1)	20.8 (5.9)	0.43	0.17–1.11	
Religion	Protestant	145	6.2 (2.0)	13.8 (2.9)	42.8 (4.1)	37.2 (4.0)	1		
	Catholic	52	7.7 (3.7)	15.4 (5.1)	44.2 (6.8)	32.7 (6.5)	0.79	0.41–1.53	
	Muslim	32	18.8 (6.9)	12.5 (5.9)	37.5 (8.6)	31.3 (8.3)	0.62	0.25–1.55	0.16
	Other	23	17.4 (8.0)	26.1 (9.2)	26.1 (9.2)	30.4 (9.7)	0.47	0.20–1.13	
	None	58	6.9 (3.4)	17.2 (4.9)	53.4 (6.6)	22.4 (5.4)	0.52	0.29–0.94	
Free school meal entitlement	No	224	9.4 (2.0)	15.2 (2.4)	46.0 (3.4)	29.5 (3.1)	1		0.83
	Yes	85	7.1 (2.7)	16.5 (4.0)	37.6 (5.2)	38.8 (5.3)	1.06	0.64–1.76	
School type[*]	Community	183	7.1 (1.9)	15.3 (2.6)	40.4 (3.7)	37.2 (3.6)	1		
	Independent	46	10.9 (4.6)	19.6 (5.9)	45.7 (7.4)	23.9 (6.4)	0.59	0.32–1.06	0.11
	Voluntary	88	10.2 (3.3)	15.9 (3.9)	47.7 (5.4)	26.1 (4.7)	0.68	0.43–1.09	

Table gives proportions giving each response, and proportional odds odds-ratios with their 95% confidence intervals and associated significance levels, adjusting for the sampling strata.

[a] Black-Caribbean.

[b] Black-African.

[*] Unadjusted analysis as stratification was by school type.

biological information relevant to the vaccine was approved but differences emerged in relation to other types of information. Fewer parents were in favour of messages relating to safer sex (73%), treatment for STIs (67%) and sexual abstinence (56%).

Pooled attitudinal variables (summarised in Table 5) were entered into ordinal regression models to explore associations between attitudes and vaccine decisions (Table 6). For four vaccine decisions the most important attitudes that predicted a positive response were parents' beliefs that the vaccine would be effective and that evidence was trustworthy. Parents who perceived their child to be at risk of STIs were also significantly more likely to endorse these decisions. Conversely, parents who were anxious about the safety of the vaccine, parents with strong religious or cultural views, and those who thought that the vaccine encouraged sexual activity, were least likely to support these policies. Parents who found it hard to talk with their children about sex were less likely to agree to vaccinate, but this variable did not affect any other decisions. None of the variables was significantly associated with an intention to include the child in the decision-making process.

4. Discussion

Given a high uptake, HPV vaccines have the potential to greatly reduce risk of cervical cancer [12], and among socially and ethnically mixed communities such as in Manchester, an HPV vaccine uptake rate of 80% may be achievable. Based largely on the facts provided with the questionnaire, the majority of parents favoured universal school-based vaccination. Yet only 38% were definite in their approval, and there remained an important minority of ∼15% who were opposed to vaccination. The study addressed additional questions to inform development of HPV policies. Some of these were contentious because parents had diverse views on issues such as the right of a sexually active child to request vaccination without parental consent, or the scope of sexual health information to accompany vaccination. These policy-related

Table 4
Responses to questions concerning vaccination policy

Question	Response	Sample percentage (S.E.)	Population estimate (S.E.)
Do you agree that it is better to vaccinate a child before he/she becomes sexually active?	Strongly disagree	3.5 (1.0)	1.8 (0.9)
	Disagree	4.1 (1.1)	4.4 (1.6)
	Do not know	12.3 (1.9)	10.0 (2.2)
	Agree	49.2 (2.8)	49.4 (4.4)
	Strongly agree	30.9 (2.6)	34.4 (4.5)
Do you agree that it is preferable to vaccinate every child (universal vaccination)?	Strongly disagree	3.8 (1.1)	3.6 (1.6)
	Disagree	8.2 (1.5)	5.2 (1.3)
	Do not know	13.6 (1.9)	14.9 (3.4)
	Agree	45.4 (2.8)	42.8 (3.7)
	Strongly agree	29.0 (2.6)	33.5 (4.4)
At what age should vaccination start?	As recommended	8.3 (1.6)	9.1 (3.0)
	Earlier	0.7 (0.5)	0.1 (0.1)
	11–12	39.9 (2.8)	40.0 (5.0)
	13–14	32.0 (2.7)	32.3 (3.5)
	15–16	8.9 (1.6)	8.1 (2.2)
	17–18	4.6 (1.2)	4.9 (1.7)
	Never	5.6 (1.3)	5.4 (1.9)
Who should make the decision on vaccination?	Mother or female relative	4.6 (1.2)	4.7 (1.5)
	Father (or male guardian)	1.0 (0.6)	1.1 (0.7)
	The child	2.3 (0.9)	3.5 (1.7)
	Joint decision of parents and child	73.9 (2.5)	70.9 (5.0)
	Only the parents	17.3 (2.2)	18.6 (4.7)
	Someone else	1.0 (0.6)	1.2 (0.8)
Do you agree that a well informed child should be able to request vaccination at sexual health clinics without parental consent?	Strongly disagree	16.4 (2.1)	17.5 (3.6)
	Disagree	25.6 (2.4)	29.7 (4.1)
	Do not know	12.3 (1.9)	11.1 (2.4)
	Agree	32.5 (2.6)	28.6 (3.3)
	Strongly agree	13.2 (1.9)	13.0 (2.6)
Do children need information about the vaccine?	Yes	95.8 (1.2)	97.1 (1.0)
Should information be given in school?	Yes	95.0 (1.2)	95.9 (1.4)
If given in school, what should it be? . . .			
Information on cervical cancer and its prevention	Yes	85.0 (2.0)	84.2 (3.0)
Biological information on HPV and other STIs.	Yes	89.3 (1.8)	91.0 (2.0)
Information of when and where to get treated for STIs.	Yes	71.0 (2.6)	67.0 (4.4)
Sexual abstinence messages	Yes	59.2 (2.8)	55.6 (4.6)
Safer sex messages.	Yes	77.5 (2.3)	72.7 (3.7)

issues will need to be carefully considered and the vaccine appropriately "packaged" to ensure optimal vaccine uptake.

This is the first UK study to assess parental views on HPV vaccines and provides useful baseline information for further research and for policy makers, bearing in mind that people may respond differently when faced with an actual vaccination decision [13,14]. The survey was based on the whole-population, and is unlikely to be biased, except for under-representation of the religious views of one non-participant school. A response rate of 22% was lower than the 35% achieved in a comparable Dutch survey of future childhood vaccines, but that study recruited relatively well-educated parents through a large children's day-care organization [15]. Additionally, we could not follow-up non-responders due to ethical requirements for anonymity, and data protection issues governing access to mailing addresses. The major social and ethnic groups were well represented within the sample, and as vaccine acceptance did not vary significantly across these groups, it seems unlikely that non-response has appreciably biased the results.

The lack of association between vaccine acceptance and socio-demographic factors is also broadly true for adolescent hepatitis B (HBV) vaccination uptake. In the United States, the provision of education and free vaccination in a convenient location, together with careful follow-up, diminished many of the socio-economic obstacles to uptake [16]. In the UK a feasibility study of school-based adolescent HBV vaccination in Glasgow achieved a coverage of ∼90% of students for at least two vaccine doses [17], irrespective of the religious or funding status of the school [18]. For most parents, safety and trust issues are relatively more important than socio-demographic background [19,20], even for adolescent STI vaccines [13]. Only 61% of parents in this study said they would trust government reassurances about vaccine safety, and challenges to vaccine policies may be most strongly expressed by highly educated parents and even

Table 5
Description of aggregated variables and their components describing parental attitudes and beliefs about HPV vaccine policy

Aggregated variable	Component statements	Number responding positively to statement*	
		Number	Population estimate % (S.E.)
Worried about STIs	Children are starting sex at younger ages	161	52.7 (4.1)
	Young people are sometimes pressured into having younger sex	172	54.4 (4.3)
	Young people do not know how to protect themselves	81	29.8 (4.7)
	Children make their own decisions about sex	131	37.5 (4.0)
	There are many sexual infections around	195	63.0 (4.1)
Worried about vaccine safety	Worried by short term side effects	180	58.2 (4.0)
	Worried the vaccine might affect adolescent development	167	56.0 (4.3)
	Worried the vaccine might have unknown long term side effects	220	70.3 (4.0)
Wants reassurance about vaccine efficacy	Wants reassurance that the vaccine will protect against HPV	283	89.6 (2.5)
	Wants reassurance that the vaccine will protect against cervical cancer	280	88.6 (2.5)
Will base vaccine decision on efficacy	Vaccine decision will be influenced by knowledge that the vaccine protects against HPV	246	82.0 (2.7)
	Vaccine decision will be influenced by knowledge that the vaccine protects against cervical cancer	247	79.9 (3.0)
Belief in the authorities	Will believe the government that the vaccine is safe	194	60.6 (4.6)
	Will believe scientific evidence that the vaccine is safe	250	78.2 (4.4)
Influenced by culture or religion	Our religion/culture does not permit sex before marriage	55	23.8 (3.2)
	My decision will be influenced by my religious beliefs	44	11.1 (1.9)
Communication problems with child	This is not a subject we talk or think about	24	7.5 (2.0)
	I find it hard to talk to my children about sex	27	13.1 (4.5)
Partner will not expose child to STIs	I think my child will choose a partner who will not have an infection	18	5.7 (2.0)
	My child is sensible and will use condoms to prevent infection	118	37.9 (4.3)
Vaccination will encourage sexual activity	My decision will be influenced by concerns that the vaccine will encourage my child to have sex	40	11.3 (2.6)

* Those not responding to question are excluded. For the 5-point scales the figure represents the proportion responding "agree"/"strongly agree" or "probably"/"yes".

health workers [15]. Although not reaching statistical significance, our data suggested a lower potential uptake among some ethnic and religious minority groups. HPV infection is highly prevalent among young adolescents who have had a single partner [21] but some parents may not acknowledge their child's risk and indeed, there is evidence that STI risk is not evenly distributed among Britain's ethnic groups [22]. Moral risks associated with vaccination may be perceived to outweigh its benefits—although hopefully an emphasis on cervical cancer prevention could overcome reluctance to vaccinate unmarried adolescents. These issues need further exploration because cultural and religious beliefs that influence family structure, sexual behaviour and parental control are not best characterised by race/ethnicity [23,24]. Our results also demonstrated that parents hope their children will be protected from STIs because of sensible sexual behaviour or use of condoms (Table 5). It will be important to ensure that parents and children are aware that condoms may not protect against HPV infection [25]. Others are concerned that STI vaccines give children a false sense of protection against STIs and encourage promiscuity [26].

Two American studies have shown much higher levels of awareness (∼70%) about HPV among young women and parents than this study [9,27]. In this and a previous UK study [8], it was striking that mothers, many who have been exposed to cervical screening, had little awareness of the link between HPV and cervical cancer. Indeed the Department of Health leaflet sent to women advising then to go for their smear, does not mention HPV [28]. Our results suggest that communication is central to HPV acceptance, whether this is between

Table 6
Ordinal regression, adjusting for sampling strata, of the pooled attitudinal variables as they related to parental views on HPV vaccination policies

Attitude	No	OR	CI	*P*
Probability of agreeing to vaccination				
STI worries	306	7.9	2.0–31.3	0.001
Safety worries	311	0.59	0.40–0.88	0.006
Convinced of efficacy	307	51.8	16.0–167.8	<0.001
Believes authorities	311	3.8	2.2–6.7	<0.001
Cultural/religious perspectives	311	0.09	0.03–0.26	<0.001
Communication problems	306	0.13	0.03–0.57	0.009
Sexual activity worries	307	0.10	0.04–0.26	<0.001
Level of information to be provided to child at vaccination				
STI worries	306	10.7	3.1–36.6	<0.001
Convinced of efficacy	307	11.0	4.6–26.2	<0.001
Cultural/religious perspectives	311	0.35	0.13–0.91	0.035
Agreement with universal vaccination				
STI worries	306	7.7	2.4–24.7	<0.001
Safety worries	311	0.73	0.53–1.00	0.043
Convinced of efficacy	307	10.4	4.5–24.1	<0.001
Believes authorities	311	2.8	1.7–4.4	<0.001
Cultural/religious perspectives	311	0.13	0.05–0.30	<0.001
Sexual activity worries	307	0.13	0.06–0.30	<0.001
Agreement with child getting vaccinated without parental consent				
STI worries	306	3.0	1.2–7.5	0.016
Safety worries	311	0.61	0.45–0.83	0.001
Convinced of efficacy	307	3.4	1.6–7.3	0.002
Believes evidence	311	2.0	1.3–3.0	0.001
Cultural/religious perspectives	311	0.25	0.11–0.57	0.001
Sexual activity worries	307	0.36	0.17–0.77	0.011

No is number of available responses to each question. OR: Odds ratios. These are relative to the scale length. Table includes only variables associated at a <0.05 level of significance.

health professionals and patients, or parents and children. Of particular interest was the fact that parents who talked to their children about the survey were more likely to support vaccination. HPV vaccination could provide a starting point for parents who find it problematic to discuss sexual issues with their children [29]. It is difficult to engage young men in sexual health decisions, but HPV vaccination for boys could provide a useful entry point, and seems to be supported by parents.

In conclusion, this study demonstrates that for high uptake, a case for HPV vaccination will need to be built. The focus should be on prevention of cervical cancer but with such a high STI prevalence among young people, the broader spectrum of adolescent sexual health risks should not be ignored.

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