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PRIMARY CARE PHYSICIANS' ADHERENCE TO GUIDELINES AND THEIR LIKELIHOOD TO PRESCRIBE HPV VACCINE FOR 11–12 YEAR-OLD GIRLS

Andrzej Kulczycki¹, Haiyan Qu², and Richard Shewchuk³

Haiyan Qu: hyqu@uab.edu; Richard Shewchuk: shewchuk@uab.edu

¹Associate Professor, Department of Health Care Organization and Policy, University of Alabama at Birmingham (UAB)

²Research Assistant Professor, Department of Health Services Administration, School of Health Professions, UAB

³Professor, Department of Health Services Administration, School of Health Professions, UAB

Keywords

human papillomavirus (HPV) vaccine; professional guidelines; primary care physician; attitudes; barriers; prescription behaviors; vaccination rates

Introduction

Human papillomavirus (HPV)¹ is the most common sexually transmitted infection in the United States (U.S.) and worldwide (Satterwhite, Torrone, Meites, Dunne, Mahajan, & Ocfemia, 2008; Forman, de Martel, Lacey, Soerjomataram, Lortet-Tieulent, & Bruni, 2012). Persistent infection with high-risk strains can cause cervical, anogenital, oropharyngeal, and other cancers, as well as genital warts (Jemal, Simard, Dorrell, Noone, Markowitz, & Kohler, 2013). HPV vaccination began in 2006 when the quadrivalent HPV vaccine was introduced for use in females and a bivalent HPV vaccine was approved in 2009. Both vaccines protect against HPV types 16 and 18, which cause 70% of cervical cancers, and the quadrivalent vaccine also protects against HPV-6 and -11, responsible for 90% of genital warts. By 2010, the prevalence of HPV-16 and -18 fell by 56% in 14–19 year-old females, confirming vaccine efficacy (Markowitz, Hariri, Lin, Dunne, Steinau, & McQuillan, 2013).

Correspondence: Andrzej Kulczycki, PhD, Associate Professor, Dept. of Health Care Organization & Policy, Maternal and Child Health Concentration, University of Alabama at Birmingham (UAB), 320 Ryals Public Health Bldg., 1665 University Blvd., Birmingham, AL 35294-0022, Tel.: (205) 934-9875. Fax: (205) 934-3347. andrzej@uab.edu.

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¹**Abbreviations:** HPV, human papillomavirus vaccination; ACIP, Advisory Committee on Immunization Practices; AAFP, American Academy of Family Physicians; AAP, American Academy of Pediatrics; AMA, American Medical Association; CI, confidence interval; CME, continuing medical education; OR, odds ratio; PCP, primary care physician.

Vaccination is advised before exposure to HPV and hence sexual debut, which occurs during adolescence for most people (Guttmacher Institute, 2014). It is also more cost-effective when given to pre-teens. The Advisory Committee on Immunization Practices (ACIP) recommends routine vaccination for 11–12 year-old girls (though this may begin at age nine) and ‘catch-up’ vaccination through 26 years of age (Markowitz, Dunne, Saraiya, Chesson, Curtis, & Gee, 2014). The recommendation for the quadrivalent vaccine was expanded in 2011 to include males and a 9-valent vaccine will become available in 2015, offering protection against 90% of cervical and other anogenital cancers (Dochez, Bogers, Verhelst, & Rees, 2014; Petrosky, Bocchini, Hariri, Chesson, Curtis, & Saraiya, 2015).

HPV vaccination rates remain low, however, and substantially lower than for other vaccines licensed and recommended for children and adolescents at about the same time. In 2013, only 57% of 13–17 year-old females had initiated HPV vaccination and 38% were fully immunized with all three doses of vaccine (CDC, 2014a; 2014b). Geographic, socioeconomic, racial and ethnic disparities in HPV vaccine initiation and completion have emerged. The lowest vaccination rates are found in Southern states; in poorer neighborhoods and in rural communities; among those not covered by public insurance; and among non-Hispanic blacks (Widdice, Bernstein, Leonard, Marsolo, & Kahn, 2011; Pruitt & Schootman, 2010; Dempsey, Cohn, Dalton, & Ruffin, 2011; Ylitalo, Lee, & Mehta, 2013; Niccolai, Mehta, & Hadler, 2011; Gelman, Miller, Schwarz, Akers, Jeong, & Borrero, 2013). For example, HPV coverage rates in Mississippi and Alabama, which are more rural and have among the lowest median household incomes of U.S. states, are significantly lower than those found in the more economically developed and urban Northeastern states. Failure to address these vaccination disparities could potentially exacerbate disparities in cervical cancer rates and in the incidence of other HPV-associated diseases in the future.

Numerous professional organizations, including the American Academy of Family Physicians (AAFP) and American Academy of Pediatrics (AAP), have issued position statements endorsing ACIP guidance (Wolfe, 2012). However, multiple factors may impede implementation of HPV vaccination in practice. These may include parental attitudes and beliefs such as fears the vaccine may increase early sexual activity, low awareness that it reduces cervical cancer and genital warts, perceived low risk for contracting HPV, and the expense and time of negotiating three vaccinations and clinic visits (Bednarczyk, Davis, Ault, Orenstein, & Orner, 2012; Mayhew, Mullins, Ding, Rosenthal, Zimet, & Morrow, 2014; Dorrell, Yankey, Santibanez, & Markowitz, 2011; Darden, Thompson, Roberts, Hale, Pope, & Naifeh, 2013; Holman, Benard, Roland, Watson, Liddon, & Stokley, 2014). Multiple factors may also prevent health care professionals from prescribing HPV vaccine, but these have been less studied. Vaccination rates will likely remain low without good adherence to professional guidelines and, potentially, mandated HPV vaccination for middle-school entry. However, a mandate requirement is resisted by many stakeholders (Perkins & Clarke, 2012; Chatterjee, 2013; Colgrove, Abiola, & Mello, 2010; National Conference of State Legislatures, 2013) who may include physicians (deSante, Caplan, Shofer, & Behman, 2010; Kahn, Cooper, Vadaparampil, Pence, Weinberg, & LoCoco, 2009), although recent studies of their beliefs about mandated HPV vaccination are lacking.

The goal of this study is to understand the extent to which adherence to clinical guidelines, as indicated by the reported intentions of primary care physicians (PCPs) to prescribe HPV vaccination, is influenced by perceptions of guideline clarity. Lack of guideline clarity has been identified as a factor related to behavioral inertia and failure to adopt best clinical practices as suggested by evidence (Cabana, Rand, Powe, Wu, Wilson, & Abboud, 1999). However, there is surprisingly limited research on how physicians perceive HPV vaccine guidelines. Specifically, we examined PCPs' stated likelihood to prescribe HPV vaccine for 11–12 year-old girls as recommended by their professional guidelines. We hypothesized that the key predictors of likelihood to prescribe the vaccine to girls in the vaccine-targeted age-group are attitudinal factors, professional norms, perceived barriers to vaccination, as well as socio-demographic and practice-related characteristics. Further, we explored possible regional variations between Southern states and the rest of the country in reported likelihood levels of vaccine prescription and their correlates.

Our focus is on family physicians and pediatricians because they are primarily responsible for prescribing the vaccine to females in the targeted age-group. Earlier research suggested strongly that physician recommendation of HPV vaccination increases parental and adolescent vaccine acceptance (Brewer & Fazekas, 2007), intent to receive it (Kahn, Ding, Huang, Zimet, Rosenthal, & Frazier, 2009), and immunization rates (Caskey, Landau, & Alexnader, 2009). Recent studies reiterate the salience of physicians' recommendations (Darden, Thompson, Roberts, Hale, Pope & Naifeh, 2013; Holman, Benard, Roland, Watson, Liddon, & Stokley, 2014), but the term is often used non-specifically in the HPV vaccination literature and other factors associated with such behaviors remain unexamined, particularly with respect to the target age-group. Physicians' adherence to clinical practice guidelines and their perceptions have received scant attention. These issues need to be re-evaluated now that the vaccine has been available and recommended for several years. Moreover, as argued recently by the President's Cancer Panel, HPV vaccination research should be a national priority given that immunization rates remain well below those needed to obtain population-level benefits and those attained for other new vaccines recommended routinely at 11–12 years of age (U.S. Dept. of Health and Human Services, 2014).

Methods

Survey instrument

We developed and pre-tested a questionnaire to explore PCPs' intentions to administer HPV vaccine. Survey development was informed by elicitation of PCPs' views, reviews of research regarding influences on physicians' HPV vaccine behavior and their perceptions of professional recommendations, and constructs of the theory of planned behavior (attitudes, perceived behavioral controls and subjective norms). Survey content validity was assessed by seven prominent family physicians and related faculty at the authors' university and experts in the field of HPV vaccination. Questionnaire items were piloted with 10 family practitioners and pediatricians before survey administration.

The outcome measure was assessed using the item: "How likely are you to prescribe HPV vaccine to girls who are 11–12 years old?" Responses ranged from "not at all likely" to "very likely" (a 5-point Likert scale). A vaccine prescription involves a clinic order

authorizing vaccine use and should include a recommendation as part of a patient-centered discussion with the patient/parent, rather than as a simple declarative instruction that may not be a sufficient driver of patient behavior. Multi-item Likert-scaled responses were also used to represent other constructs of interest. These included views and understanding of ACIP and professional society recommendations, belief in mandated HPV vaccination for middle-school entry and comfort discussing HPV vaccination with 11–13 year-old girls; as well as potential barriers such as the administrative costs associated with reimbursement for health care providers, and the lack of patient adherence to follow-up vaccinations. Scaled responses were dichotomized (likely versus unlikely; agree versus disagree) to preserve sufficient cases in variable response categories for analyses. Other relevant independent variables included socio-demographic and practice characteristics such as medical specialty, practice setting, region, years since graduation from medical school, and estimated proportions of racial/ethnic minority patients and using public assistance.

Study sample design and population

We surveyed by mail and the Internet a representative sample of PCPs using a systematic randomized sampling design in mid-2011 (several months before vaccination of males was routinely recommended). For the states selected, family practitioners and pediatricians were identified from the American Medical Association's (AMA) Masterfile. Eligible PCPs needed to respond to a filter question that they had vaccinated 11–12 year-olds. Respondents who completed the entire questionnaire were given a \$50 gift card for their time. The project was reviewed and approved by the Institutional Review Board of the University of Alabama at Birmingham.

The sample was designed to be about evenly split between both medical specialties, as well as between Southern states and a random selection of other U.S. states. The two Southern states, Alabama and Mississippi, have a high HPV-associated disease burden, major disparities in cervical cancer, and low HPV immunization rates. Series completion in Mississippi, in particular, is among the lowest in the nation (25.2% for 13–17 year-old females in 2013) (CDC, 2014b). Further, subjects were recruited from 10 other randomly selected states, with 13 respondents (comprising at least 6 family practitioners and 6 pediatricians) selected in each. PCPs received up to three reminders to complete the survey over the next month.

Statistical analyses

Descriptive, bivariate and multivariate statistics were used to estimate relationships between the outcome and the attitudes, norms, barriers, demographic and practice-related characteristics considered. To facilitate bivariate and multivariate comparisons, we explored both the original scaled responses and then the collapsed dichotomous variables. Chi-square tests were used to assess whether each of the characteristics were associated with the dependent variable. Subsequently, multivariable logistic regression analyses were employed to examine the range of factors associated with the likelihood of prescribing HPV vaccination. Statistical significance was assessed using a significance level of 0.05. All analyses were performed using SPSS version 22 (SPSS Statistics, SPSS Inc., Chicago, IL).

Results

Sample description

A total of 301 questionnaires were completed (43% response proportion). The sample was almost evenly divided between family practitioners and pediatricians, with 56% from Alabama and Mississippi (Table 1). Respondents were mostly male (55%), Caucasian (71%), suburban (51%), and had on average graduated 20.7 years ago from medical school. Every second PCP (50%) reported that at least 25% of their patients were using public assistance programs. Respondents' demographic and practice characteristics were generally comparable to those for all PCPs for these two specialties in the AMA Masterfile (not shown).

Two-thirds (67%) of the respondents said they were likely to prescribe HPV vaccination to 11–12 year old girls. However, 14% of PCPs unequivocally disagreed with the statement that professional guidelines about HPV vaccination offered clear guidance and only 22% of respondents categorically believed in mandated HPV vaccination. The stated lack of prescription intention and of guideline clarity were implicated further in the observations that 15% of PCPs estimated that <50% of their 11–12 year old patients had received HPV vaccination, 24% said that they initiated discussion on the topic fewer than half the times that they met an unvaccinated adolescent female patient in their office, and 38% said they were uncomfortable discussing HPV vaccination with 11–13 year-old girls. Additional barriers to HPV vaccine prescription included administrative costs required for reimbursement (cited by 43% of respondents) and the lack of patient adherence to follow-up vaccination (22%).

Multivariable logistic regression analyses

Logistic regression analysis was used to model stated intentions to prescribe HPV vaccination as a function of the variables posited above. Four variables were significantly associated with the outcome (Table 2). PCPs who agreed that the vaccine guidelines offer clear guidance were significantly more likely to prescribe HPV vaccine for 11–12 year-old girls than those who did not (OR, 1.85; 95% CI, 1.03–3.35). Physicians who believed in mandated HPV vaccination for middle-school entry were over twice as likely to prescribe vaccine as those who did not accept such a mandate (OR, 2.39; 95% CI, 1.01–5.61). PCPs were five times as likely to prescribe vaccine if they were comfortable discussing it with early adolescent girls relative to those who expressed unease (OR, 5.10; 95% CI, 2.75–9.45). Additionally, PCPs who reported that at least 25% of their patients paid for their clinic visits using Medicaid, state, or other federal assistance were also more likely to prescribe HPV vaccine to the target age-group than those with fewer such patients (OR, 3.82, 95% CI, 1.91–7.64).

Concerns about the administrative costs of vaccine reimbursement required for a health care provider, or about the lack of patient adherence to follow-up vaccinations, were not statistically associated with the outcome. PCPs were somewhat less likely to prescribe the vaccine to 11–12 year-old girls if they were family physicians, if they practiced in the South, in rural or in suburban areas, or if they were White, but these factors were also not

statistically significant in multivariable analysis. The goodness-of-fit summary statistics showed that the model fits the data reasonably well and has good predictive power.

Discussion

Infections caused by HPV result in considerable morbidity and mortality worldwide. HPV vaccines can significantly alleviate this disease burden, but low coverage rates in the U.S. indicate the need to strengthen efforts to realize the potential benefits of immunization. This study highlights, in particular, that many PCPs do not incorporate key aspects of professional guidelines concerning HPV vaccination into their routine care. The finding that only 67% of our sample indicated they were likely to prescribe the vaccine to girls in the targeted age-group might be attributed to the fact that 34% of respondents reported some ambivalence about the clarity of professional guidelines. However, lack of physician endorsement exposes young women to infections and leads to sub-optimal immunization rates.

More research is needed about current HPV vaccination practices of U.S. physicians. A study conducted 18 months post-licensure reported that 56% of pediatricians and 50% of family physicians strongly recommended HPV vaccination for 11–12 year-old patients, compared to significantly higher proportions for 13–15 year-old patients (90% and 86%, respectively) (Daley, Crane, Markowitz, Black, Beaty, & Kemfe, 2010). In 2011, only 40% of physicians always recommended HPV vaccine to 11–12 year-old female patients (Vadaparampil, Malo, Kahn, Salmon, Lee, & Quinn, 2014). Studies identify having a health care provider as a source of information to be an important predictor of HPV vaccine uptake among adolescent girls (Kessels, Marshall, Watson, Braunack-Mayer, Reuzel, & Tooher, 2012), but all too often, prior research has tended to discount that many physicians may not prescribe HPV vaccination to 11–12 year-old girls as recommended in ACIP guidelines and endorsed by PCPs' own medical bodies.

Many physicians lack awareness of adolescent sexual behaviors, including age of sexual debut, leading to misperceptions of risk and sexual health, and adversely influencing their discussions about HPV vaccination (Hoffstetter & Rosenthal, 2014; Hughes, Jones, Feemster, & Fiks, 2011). They may also lack knowledge about aspects of HPV vaccines and vaccination recommendations, and may misjudge parental and adolescent barriers to HPV vaccination (Fishman, Taylor, Kooker, & Frank, 2014). Some providers may use pre-vaccination assessments not recommended by guidelines (Roland, Benard, Greek, Hawkins, & Saraiya, 2014). More effort may be needed to promote physicians' self-efficacy to encourage the HPV vaccine to parents of young females (Krieger, Katz, Kam, & Roberto, 2012). Current strategies to boost immunization coverage tend to focus on parents and patients which, though helpful, are insufficient to boost uptake. There is evidence that neither parental nor adolescent knowledge is related to subsequent adolescent vaccination (Fishman, Taylor, Kooker, & Frank, 2014).

This research indicates that the attitudes physicians hold about HPV vaccination and their concerns about their patients may be driving their vaccine behavior even more strongly than the professional guidelines themselves. In logistic regression models, four variables were

significantly associated with physicians' likelihood to prescribe HPV vaccine to 11–12 year-old girls: acceptance of vaccine guideline clarity and of a mandate requirement, comfort discussing HPV vaccination with 11–13 year-old females, and having at least 25% of patients paying for their clinic visits using public assistance. Despite the compelling rationale of HPV vaccine recommendations, adherence to professional guidelines regarding pre-adolescent HPV vaccination remains sub-optimal. Only 55% of respondents cited ACIP or CDC as their primary source on HPV vaccine guidelines, 25% reported significant ambivalence about some aspects of professional recommendations, and 9% said that adhering to professional guidelines “is not a priority for me” (not shown). Evidently, some PCPs still harbor considerable concerns about the vaccine and tension exists between practice autonomy and the demands for evidence-based protocols. The future resolution of this tension requires further research. The issue of guideline adherence will remain fundamental as a second generation vaccine becomes more widely available.

PCPs are likely well-informed about most aspects of HPV vaccination, although some gaps in knowledge and communication may need to be narrowed, perhaps through continuing medical education (CME), supplementary professional information and additional patient educational materials. This could help make PCPs more comfortable about HPV vaccine discussion and prescription for the targeted age-group. Mandatory HPV vaccination for middle-school entry could potentially assure broader coverage, but 65% of respondents in this study unequivocally disagreed with such a requirement. This implies that a mandate policy lever may not be acceptable to physicians. Further, there is much potential for a broad societal backlash against a HPV mandate and opt-out provisions are problematic (Chatterjee, 2013; Colgrove, Abiola, & Mello, 2010).

Strengths and Limitations

There are several limitations to this study. First, the data are self-reported and could not be checked through other methods, although there is little reason to think they would be subject to social desirability or recall biases. Second, it is possible that respondents differ in some unknown ways from most PCPs in their knowledge, attitudes, and practices regarding HPV vaccination, but we found no evidence of participation bias. Limited resources prevented us from conducting a larger, more truly nationally representative survey, but we sought to make the study as representative as possible of these specialties, as well as of Southern states and of the rest of the country. Respondents do not appear to have any major different characteristics from their professional peers. We believe our data are at least generally reflective of the reported intentions, subjective norms, and barriers held by family medicine physicians and pediatricians regarding vaccine prescription to 11–12 year-old girls. Levels of public awareness of HPV vaccination may be lower in the South, but they need not be lower among physicians. Third, this study assessed likelihood to prescribe HPV vaccination rather than its actual administration. Nevertheless, behavioral intention is a strong determinant of actual behavior, as predicted by the theory of planned behavior which is widely used to predict a range of health-related behaviors, including professional recommendations (Godin & Kok, 1996). Lastly, other factors not included in the survey questionnaire may be influencing the likelihood of vaccine prescription, which is subject to multiple influences. Additional variables were examined in bivariate tests, but these were

not included in the multivariable analysis because none of these factors were statistically different between PCPs who were likely and those who were not likely to prescribe the vaccine in the targeted age-group.

These limitations are offset by multiple study strengths. Specifically, this study assessed PCPs' attitudes which may be particularly important because their recommendations are closely monitored and are salient to parents seeking advice when faced with decisions to vaccinate their children. Although HPV vaccination promises major public health benefits, this study shows that vaccine coverage rates are low at least in part because PCPs' views and behavioral intentions regarding HPV vaccination may vary more than is commonly recognized. Additional study strengths included the recruitment of a robust sample and attainment of an adequate response rate for a physician survey. Our final multivariable model fits the data reasonably well and identifies several variables predictive of PCPs' guideline adherence and statistically related to the stated likelihood of prescribing the vaccine to females in the targeted age-group that warrant further investigation.

Implications for Practice and/or Policy

HPV vaccination rates remain low in the U.S., especially in the guideline-targeted ages 11–12. This study shows that the perceived lack of guideline clarity is associated with lower stated likelihood to prescribe vaccine, which in turn is associated with lower actual vaccination rates. Although clinical guidelines are evidence-based and should inform physician decision-making, many PCPs do not follow the recommendations regarding HPV vaccination. This could be due to the fact that many PCPs view the guidelines as lacking clarity. Additionally, PCPs are more likely to prescribe HPV vaccination if they report being comfortable discussing the topic and believe that there should be a vaccination mandate. Our ongoing research further suggests the importance of physician-initiated communication about HPV vaccination to starting and completing the vaccine series with 11–12 year old girls. Study results, in combination with the emerging literature regarding PCPs' behaviors with respect to HPV vaccination, could help inform additional efforts that are needed to improve vaccine uptake. Efforts to enhance vaccination rates should focus on addressing attitudinal barriers associated with failure to follow clinical recommendations in this important area.

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Biographies

Andrzej Kulczycki, PhD, is an Associate Professor in the Department of Health Care Organization and Policy, University of Alabama at Birmingham (UAB) School of Public Health. Dr. Kulczycki's research focuses on reproductive health, demography, health policies and programs, and research methods.

Haiyan Qu, PhD, is Research Assistant Professor in the Department of Health Services Administration, UAB School of Health Professions. Dr. Qu's research interests include women's health, health outcomes and disparities, health care quality, and patient-centered care.

Richard Shewchuk, PhD, is Professor in the Department of Health Services Administration, UAB School of Health Professions. Dr. Shewchuk's research focuses on health care delivery and management, research methodology, health promotion interventions for low-income and under-served communities, and continuing medical education.

Table 1

Sample Statistics and Associations between Primary Care Physician's Demographic, Practice and Attitudinal Characteristics and Likelihood to Prescribe Human Papillomavirus (HPV) Vaccine to 11–12 Year-old Girls (n=301).

Variable	Overall (n=301) No. (%)	Intent to Prescribe HPV Vaccine		p-value ^a
		Unlikely (n =98) No. (%)	Likely (n=203) No. (%)	
Demographic characteristics				
Sex				
Male	164(54.5)	58 (35.4)	106(64.6)	1.29
Female	137(45.5)	40 (29.2)	97(70.8)	
Racial/ethnic minority status				
No	216(71.8)	75 (34.7)	141 (65.3)	1.63
Yes	85(28.2)	23 (27.1)	62 (72.9)	
Years since graduated from medical school (mean, SD) ^b	20.7(10.5)	20.9(9.6)	20.7(10.9)	0.15
Practice characteristics				
Provider type				
Family practitioner	148(49.2)	50 (33.8)	98 (66.2)	1.99
Pediatrics	153 (50.8)	48 (31.4)	105 (68.6)	
Practice setting				
Urban	80(26.6)	23 (28.7)	57 (71.3)	9.23*
Suburban	152(50.5)	61 (40.1)	91 (59.9)	
Rural	69(22.9)	14 (20.3)	55 (79.7)	
Region				
South	169(56.1)	47 (27.8)	122 (72.2)	3.96*
Rest of the country	132(43.9)	51 (38.6)	81 (61.4)	
% of patients on public assistance				
<25%	150(49.8)	70 (46.7)	80 (53.3)	27.11**
25%	151(50.2)	28 (18.5)	123 (81.5)	
Attitudinal toward HPV vaccination				
Mandated HPV vaccine for teen girls				
Disagree	234(77.7)	88 (37.6)	146 (62.4)	12.20**
Agree	67(22.3)	10 (14.9)	57 (85.1)	
Comfort discussing HPV vaccination				
Perceived as a barrier	116(38.5)	64 (55.2)	52 (44.8)	43.96**
Not perceived as a barrier	199(66.1)	34 (18.4)	151 (81.6)	
HPV vaccine guidelines are clear				
Disagree	102(33.9)	49 (48.0)	53 (52.0)	16.84**
Agree	199(66.1)	49 (24.6)	150 (75.4)	
Administrative costs of physician reimbursement				
Unlikely	171(56.8)	59(34.5)	112(65.5)	0.68

Variable	Overall (n=301) No. (%)	Intent to Prescribe HPV Vaccine		<i>p</i> -value ^a
		Unlikely (n =98) No. (%)	Likely (n=203) No. (%)	
Likely	130(43.2)	39(30.0)	91(70.0)	
Patient non-adherence to follow-up vaccinations				
Significant	65(21.6)	20 (30.8)	45 (69.2)	0.12
Not Significant	236(78.4)	78 (33.1)	158 (66.9)	

^a Chi-square tests were used for categorical variables;

*
p<.05;

**
p<.01;

^b Independent-sample t-tests were used for quantitative variable.

Table 2

Final Multivariable Logistic Regression Model Predicting Likelihood to Prescribe HPV Vaccine to 11–12 Year-old Girls by Primary Care Physicians (n=301).

Predictors (reference group)	Odds Ratio	95% C.I.	
		Lower	Upper
<i>Socio-demographic characteristics</i>			
Physician's sex (male)	1.02	0.55	1.89
Physician's racial/ethnic minority status (not minority)	0.88	0.44	1.77
Years since graduation from medical school (years)	0.99	0.97	1.03
<i>Practice-related characteristics</i>			
Specialty (family practice)	0.57	0.30	1.09
Practice setting (urban)			
Suburban	0.88	0.41	1.85
Rural	0.69	0.48	1.21
Region (South)	0.93	0.50	1.75
Patients on public assistance (< 25%)	3.82**	1.91	7.64
<i>Attitudes</i>			
Agrees with mandated HPV vaccination (disagrees)	2.39*	1.01	5.61
Comfortable discussing HPV vaccination (disagrees)	5.10**	2.75	9.45
Accepts HPV vaccine guideline clarity (disagrees)	1.85*	1.03	3.35
Lack of patient adherence to follow-up vaccinations (disagrees)	0.79	0.39	1.61
High administrative costs of physician reimbursement (disagrees)	1.55	0.50	4.85

Note: C.I.= confidence interval;

Significance level of odds ratios:

* $p < .05$,

** $p < .01$.

Hosmer and Lemeshow Test: $\chi^2(8, N=301)=4.114$, $p=0.874$ indicating a good model fit ($p>0.05$). Adjusted $R^2=.343$