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Do Florida Medicaid Providers' Barriers to HPV Vaccination Vary Based on VFC Program Participation?

Teri L. Malo, PhD¹, Donna Hassani¹, Stephanie A. S. Staras, PhD², Elizabeth A. Shenkman, PhD², Anna R. Giuliano, PhD^{3,4}, and Susan T. Vadaparampil, PhD^{1,4}

¹Department of Health Outcomes and Behavior, Moffitt Cancer Center, Tampa, FL

²Department of Health Outcomes and Policy, College of Medicine, University of Florida, Gainesville, FL

³Department of Cancer Epidemiology, Moffitt Cancer Center, Tampa, FL

⁴Department of Oncologic Science, College of Medicine, University of South Florida, Tampa, FL

Abstract

Objectives—This study aimed to determine if physicians' perceived barriers to HPV vaccination were associated with participation in the federal Vaccines for Children (VFC) program.

Methods—A sample of 800 Florida Medicaid providers was randomly selected from the Florida Medicaid Master Provider File. A cross-sectional study was conducted using a 27-item survey that included 13 potential barriers to immunizing Medicaid patients against HPV, including concerns about vaccine safety and efficacy, discussing sexuality, vaccinated teens practicing riskier sexual behaviors, cost and reimbursement, ensuring 3-dose series completion, and school attendance requirements associated with HPV vaccination. Pearson Chi-square tests were conducted to investigate differences between each barrier and VFC program participation. Data were analyzed for 449 physicians.

Results—Compared to non-VFC providers, VFC providers were significantly less likely to somewhat or strongly agree that the following were barriers to vaccination: the cost of stocking the HPV vaccine ($p = 0.0011$), lack of adequate reimbursement for HPV vaccination ($p < 0.0001$), and lack of timely reimbursement for HPV vaccination ($p < 0.0001$). After adjusting for provider specialty and number of years since completion of residency training, VFC status remained significantly associated with the barrier regarding lack of adequate reimbursement for vaccination such that non-VFC providers had a 2.6-fold (95% confidence interval, 1.1–5.8) greater odds of somewhat or strongly agreeing that this barrier applied to them.

Conclusions—Increasing participation in the VFC program may decrease physicians' cost-related barriers, which may increase the number of children vaccinated on time according to the recommended schedule.

Introduction

Human papillomavirus (HPV) is one of the most common sexually transmitted infections, with an estimated 20 million cases of HPV infection in the United States and 6 million new cases each year (1). Two vaccines, Gardasil® (Merck & Co., Inc.) and Cervarix®

Corresponding Author: Teri Malo, PhD, Health Outcomes and Behavior Program, Moffitt Cancer Center, 12902 Magnolia Drive, Tampa, FL 33612; Telephone: (813) 745-8705; Fax: (813) 449-8444; Teri.Malo@moffitt.org.

Author to whom requests for reprints and galley proofs should be addressed: Susan T. Vadaparampil, PhD, Moffitt Cancer Center, 12902 Magnolia Drive, MRC-CANCONT, Tampa, FL 33612; Telephone: (813) 745-1997; Fax: (813) 745-6525; Susan.Vadaparampil@moffitt.org

(GlaxoSmithKline), are currently available to confer immunity against the types of HPV infection associated with most cervical cancers. Despite availability, HPV vaccine uptake remains suboptimal; in 2010, only 48.7% of females aged 13 to 17 years had received 1 dose of the vaccine (2). In order for HPV vaccine to reduce cervical cancer incidence and prevalence, diffusion and uptake must occur.

Previous data suggest that one of the strongest factors in vaccine acceptance is a physician's positive recommendation of the vaccine (3–9). The influence of physician recommendation highlights the importance of understanding physicians' motivations for and barriers to vaccine recommendation. Some previously cited perceived barriers to HPV vaccination include parental concerns about vaccine safety and efficacy, the time it takes to discuss HPV vaccination with parents, difficulty ensuring patient completion of the three-dose series, and parental concern that vaccinating a child against a sexually transmitted infection will encourage riskier sexual behavior (10). In addition to these logistical, parental, and patient-focused barriers, physicians have reported monetary barriers to vaccination (10–15).

Barriers related to the financial facet of HPV vaccination may play a particularly large and understudied role in physician recommendation. The rising cost of administering all vaccines on the child immunization schedule has made cost an increasingly significant barrier to vaccination. A national survey conducted in 2007 indicated that the amount of reimbursement received for a vaccine plays a large role in whether a physician administers that vaccine (11). Young and colleagues found that reporting inadequate reimbursement as a frequent barrier to HPV vaccination was associated with being 55% less likely to recommend vaccination to patients (12). The researchers highlighted the importance of this finding in the context of continued disparities in cervical cancer prevention. Other studies have supported the importance of inadequate reimbursement (10, 13, 14), as well as other financial barriers to vaccine delivery, including vaccine costs (10, 13, 14) and insurance coverage (10, 13, 15).

One goal of the Vaccines for Children (VFC) program is to “remove cost as a barrier for the immunization” of children (16). The VFC program is a federally funded program that provides free vaccines to children who are Medicaid-eligible, Native American or Alaska native, or uninsured. The program also provides free vaccines to underinsured children at federally qualified health centers, rural health clinics, or their approved designees. In order for a new vaccine to be added to the list of VFC vaccines, the CDC's Advisory Committee on Immunization Practices (ACIP) must first recommend the vaccine (17). Once the vaccine has been added to the list of vaccines available to VFC-eligible children, the CDC purchases the vaccines from manufacturers at a discounted rate. These vaccines are then distributed to states to allocate the vaccines, free of charge, among VFC providers (18). This program allows VFC providers with a private practice to vaccinate their VFC-eligible patients instead of referring them to public health clinics due to insufficient reimbursement. Thus, more vaccines are administered in private practices as a result of the VFC program (17). Providing free vaccines to physicians reduces a physician's out of pocket cost (19); however, participating in the VFC program also presents difficulties for physicians such as the paperwork required to join the program, specific administrative requirements while participating in the program, and the requirement of maintaining separate private and VFC stocks of the vaccine (19).

Although previous studies have examined physicians' barriers to recommending the HPV vaccine, to our knowledge none have assessed these barriers in light of physicians' VFC program participation. Moreover, relatively little research has focused on HPV vaccination among underserved populations (20). The current study helps fill these important gaps in HPV vaccination literature. The aims of this study were to: (1) examine physicians' barriers

to immunizing patients against HPV, with particular attention to cost-related barriers, and (2) assess if barriers vary by a physician's VFC program participation.

Methods

Participant Recruitment and Data Collection

A sample of 800 Medicaid providers in Florida was randomly selected from the Florida Medicaid Master Provider File. Physicians were eligible for study inclusion if they had: a physical address in Florida, billed claims or an assigned panel that included 25 or more 9–17 year old girls in the past year, and a primary care specialty (Pediatrics, Obstetrics and Gynecology, Family Medicine, Internal Medicine, General Practice, or Preventive Medicine).

Upon Institutional Review Board approval from the University of South Florida and the University of Florida, data collection occurred between October 2009 and April 2010. A multiphase approach was used to recruit participants. First, a postcard was mailed to the physicians to inform them about the survey that would follow. Two weeks later, physicians received a Federal Express packet that contained a cover letter, scannable survey, prepaid return envelope, and \$15 cash incentive to participate. A reminder card was mailed two weeks later, followed by another copy of the survey to prompt non-responders to complete the survey. A third survey packet was mailed to those who received the second mailing due to a clerical error discovered in the cover letter suggesting \$15 was included in the second packet. The third survey packet was sent via Federal Express and contained a cover letter explaining the mistake, survey, prepaid return envelope, and \$15 cash incentive.

Measures

Physicians were mailed a 27-item survey that assessed demographic and practice characteristics, HPV knowledge, perceived barriers related to HPV vaccination, vaccine practices, and vaccine recommendation. Physicians were asked to assess 13 potential barriers to immunizing their Medicaid patients against HPV, including concerns about vaccine safety and efficacy, discussing sexuality, vaccinated teens practicing riskier sexual behaviors, cost and reimbursement, ensuring completion of the 3-dose series, and school attendance requirements associated with HPV vaccination. Specific items are presented in Table 2 with results from the data analyses. Physicians were asked to indicate on a 5-point Likert scale how strongly they agreed each item was a barrier (1=strongly disagree to 5=strongly agree). Additionally, participants were asked if they were a VFC provider. Response options included yes, no, and don't know. Participants were also asked to report their specialty and the year in which they completed their residency training; the latter was subtracted from the year of study completion (2010) to calculate the number of years since residency training completion.

Data Analysis

Data were analyzed using SAS® 9.1 statistical software package (SAS Institute Inc, Cary, North Carolina); all analyses used two-tailed tests of significance with a statistical significance level set at $p < 0.05$. Individual barrier items were dichotomized into "somewhat agree/strongly agree" and "other." Pearson Chi-square tests were conducted to investigate the association between each barrier and VFC provider status. A Tukey-type multiple comparison procedure was used to determine which groups differed among the statistically significant barriers (21, 22). Separate logistic regression models were conducted to examine the association between each statistically significant barrier and VFC status, while adjusting for potential confounding variables.

Results

Sample Demographic Characteristics

After accounting for undeliverable surveys, the response rate was 68.3% (n=485). Respondents who identified themselves as unlikely to be involved in vaccination (e.g., hospice, emergency care providers; n = 23), reported a specialty other than those targeted (n = 23), had missing data for VFC provider status (n = 13), or had no Medicaid enrollees during the study period (n = 6) were excluded, leaving 428 providers for the current analyses. The sample was predominantly male (54.2%), white (47.9%), not Hispanic or Latino (65.4%), and age 50 or older (48.4%). Additionally, 80.1% of respondents were VFC providers, 17.1% were not VFC providers, and 2.8% did not know their VFC provider status. Sample demographics by VFC status are reported in Table 1.

Barriers by VFC Provider Status

Data for all measured barriers by VFC status are shown in Table 2. Overall, many physicians somewhat or strongly agreed that the monetary aspects of HPV vaccination serve as barriers: 36.5% considered the cost of stocking the HPV vaccine a barrier, 47.4% considered lack of adequate reimbursement a barrier, and 40.2% considered lack of timely reimbursement for HPV vaccination a barrier. Statistically significant differences by VFC provider status were found for these cost-related barriers. Specifically, compared to non-VFC providers, VFC providers were significantly less likely to somewhat or strongly agree that the cost of stocking the HPV vaccine ($p = 0.0003$), lack of adequate reimbursement for HPV vaccination ($p < 0.0001$), and lack of timely reimbursement for HPV vaccination ($p < 0.0001$) are barriers to vaccination. Additionally, VFC providers were more likely to somewhat or strongly agree that concerns about vaccine safety served as a barrier to HPV vaccination ($p = 0.0056$). All other barriers were not statistically significant ($p > 0.05$).

The association between VFC status and each of the four statistically significant barrier items was examined while adjusting for provider specialty and number of years since completion of residency training, which may serve as confounding factors (Table 3). After adjusting for these other variables, VFC status remained significantly associated with the barrier regarding lack of adequate reimbursement for HPV vaccination such that non-VFC providers had a 2.6-fold (95% confidence interval, 1.1–5.8) greater odds of somewhat or strongly agreeing that this barrier applied to them. VFC status did not remain significantly associated with the other barrier items.

Discussion

The successful uptake of HPV vaccine is an important factor in preventing cervical cancer. A physician plays an integral part in fostering uptake as demonstrated by the power a physician's recommendation holds in whether a patient actually receives the vaccine (3, 4). Thus, it is important to examine physicians' perceived barriers to administering HPV vaccine.

Among the barriers evaluated in the current study, many physicians considered cost to be a barrier; cost-related items comprised the top three barriers for non-VFC providers and 32–42% of VFC providers agreed that they served as barriers to immunizing their Medicaid patients against HPV. These results are aligned with those of a national survey of Pediatricians, Family Physicians, and OBGYNs conducted in 2009, which found that over half of the sample somewhat or strongly agreed that these three factors were issues surrounding HPV vaccination (23). Similarly, another cross-sectional survey indicated the financial burden of the vaccine as one of the most frequently reported barriers to physicians (24).

Findings from this study show that non-VFC providers had a greater odds of agreeing that lack of adequate reimbursement was a barrier to HPV vaccination compared to VFC providers. Concerns about lack of adequate reimbursement for HPV vaccination were raised in a news article in 2007, and it appears these concerns continue to prevail. The article reported that doctors experienced insufficient reimbursement by some insurance companies; for instance, some companies paid doctors only \$2 more than the cost of the dose, which may not amply cover administration and stocking costs, whereas other plans reimburse at rates less than the cost of the dose (25). Some physicians reported reserving the vaccine for patients whose insurance plan provides adequate reimbursement and other physicians stated that they give patients a prescription for the vaccine to be filled at a pharmacy and later administered by the physician for a fee; however, some insurance companies do not cover the vaccine if it is not supplied by a physician. Physicians' inadequate reimbursement and subsequent decision not to administer or stock the vaccine may pose a significant barrier to HPV vaccine access for both insured and uninsured patients.

Physicians have expressed concerns about adequate reimbursement with other vaccines, including pneumococcal conjugate vaccine (26, 27), which was the most expensive vaccine on the immunization schedule prior to HPV vaccine. A study conducted in 2001 showed that physicians often referred their patients to another facility for pneumococcal conjugate vaccination, leading to a delay or even a failure in the administration of the vaccine (26). The study cited lack of reimbursement for the vaccine and the high cost of the pneumococcal vaccine as the main reasons for a physician's referral. Referring patients to other facilities to receive vaccination has been shown to lead to lower vaccine administration (28); therefore, it is important to draw on these experiences and conduct further research pertaining to HPV vaccine in order to minimize referrals to other facilities and delays in vaccine administration.

The VFC program aims to reduce the number of children referred to other facilities by working to eliminate cost as a barrier (29). Participation in the VFC program has been shown to lead to fewer referrals for vaccination (30), and fewer referrals has been associated with a stronger adherence to vaccination guidelines (31). Taken together, these findings indicate that increasing VFC program participation may be one way to decrease physicians' cost-related barriers, decrease the number of referrals to other facilities, and increase the number of children vaccinated on time according to the ACIP recommended schedule; however, when encouraging VFC program participation, it is important to address potential physician barriers associated with VFC participation. For example, findings from one national survey pointed to difficulty of record keeping and difficulty maintaining separate stocks as barriers to participation in the VFC program (31). Additionally, although VFC providers are supplied with vaccine doses, these providers may still incur vaccine administration costs that may not be recovered. Providers are allowed to charge an administration fee and the state Medicaid agency is billed this fee for Medicaid-eligible VFC children (32), but the cap on this fee may be lower than the ancillary costs of providing vaccination. Findings from the current study support the existence of cost-related barriers, with over 30% of VFC providers agreeing that lack of adequate reimbursement, lack of timely reimbursement, and the cost of stocking HPV vaccine were barriers to vaccination. Interventions designed to increase VFC program participation should take into account and attempt to minimize these barriers, perhaps by increasing reimbursement rates to cover administration fees.

Of note, physicians were asked only whether or not they were VFC providers and were not asked about other vaccine financing mechanisms available to cover HPV vaccine cost. Further, different states may have varying degrees of HPV vaccine coverage depending on the type of vaccine supply policy in which they participate. At the time this study was

conducted, Florida's vaccine financing policy was VFC-only, in which routinely recommended vaccines are supplied to private VFC-enrolled providers for only VFC-eligible patients. Although private providers do not receive state-funded vaccines for underinsured children, these children may receive the vaccine using state or local funds at public clinics (33). Conversely, other states have vaccine financing policies to offer vaccines to private and public VFC-enrolled providers to vaccinate both VFC-eligible and underinsured children, as well as universal vaccine policies offering vaccines to these providers to vaccinate all children. Thus, in order to fully understand the effects of VFC status on HPV vaccination, it is necessary to conduct further research discerning the specific types of vaccine financing policies that are available.

Although this study is among the first to examine the relationship between VFC participation and perceived barriers to HPV vaccination among a sample of Medicaid physicians, the findings should be considered in light of certain limitations. First, given that about 32% of physicians did not respond to the survey, results may be more representative of physicians who have stronger opinions about the HPV vaccine. Second, providers who are supportive of the vaccine are potentially more likely to also participate in VFC. Third, this study is cross-sectional and cannot show with certainty that participation in the VFC program is responsible for the observed differences in barriers. Finally, it is also possible that physicians provided socially desirable responses to the survey items since we asked about a vaccine for which there is a clear practice guideline issued by the ACIP.

This study also has notable strengths. The physicians sampled in this study were restricted to those who would be eligible to be VFC providers given that they are serving Medicaid participants. Additionally, a response rate of nearly 70% enhances generalizability to all Florida Medicaid providers.

Increasing HPV vaccination among adolescent females is an important approach to cervical cancer prevention. Providers' reluctance to administer and stock HPV vaccine due to inadequate reimbursement may result in patient inability to access vaccination, thereby presenting a significant threat to cervical cancer prevention that needs to be addressed. Programs such as VFC represent a policy level approach to reducing barriers, such as cost, that may impact a physician's decision to routinely offer HPV vaccination to his or her patients. More research is needed to design interventions aimed at reducing cost-related barriers to vaccination among all providers.

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Table 1

Demographic characteristics by VFC provider status (N = 428)

	VFC Yes (N=343) n (%)	VFC No (N=73) n (%)	VFC Don't Know (N=12) n (%)
Age (yr)			
25–39	45 (72.6)	15 (24.2)	2 (3.2)
40–49	120 (85.7)	17 (12.1)	3 (2.1)
50+	165 (79.7)	35 (16.9)	7 (3.4)
Gender			
Male	179 (77.2)	44 (19.0)	9 (3.9)
Female	158 (83.6)	28 (14.8)	3 (1.6)
Race			
White/Caucasian	157 (76.6)	39 (19.0)	9 (4.4)
Black/African-American	29 (76.3)	7 (18.4)	2 (5.3)
Asian	52 (86.7)	8 (13.3)	0 (0.0)
Other	81 (82.7)	16 (16.3)	1 (1.0)
Ethnicity			
Hispanic or Latino	116 (82.3)	24 (17.0)	1 (0.7)
Not Hispanic or Latino	220 (78.6)	49 (17.5)	11 (3.9)

^aPercentages may not add up to 100 due to rounding error and/or missing data

Table 2

Barriers by VFC provider status (% somewhat and strongly agree)

Barrier	VFC Yes (N=343) n (%)	VFC No (N=73) n (%)	VFC Don't Know (N=12) n (%)	p
Lack of adequate reimbursement (non-payment or partial payment) for HPV vaccine	143 (41.7)	52 (71.2)	8 (66.7)	< 0.0001
Lack of timely reimbursement for HPV vaccination	117 (34.1)	47 (64.4)	8 (66.7)	< 0.0001
The cost of stocking HPV vaccine	109 (31.8)	41 (56.2)	6 (50.0)	0.0003
Difficulty ensuring that patients will complete the 3-dose HPV vaccination series	135 (39.4)	38 (52.1)	7 (58.3)	0.0598
Concerns about vaccine safety	190 (55.4)	28 (38.4)	3 (25.0)	0.0056
HPV vaccination is not required for school attendance	154 (44.9)	26 (35.6)	4 (33.3)	0.3023
Concern that vaccinated teens will practice riskier sexual behaviors	111 (32.4)	26 (35.6)	4 (33.3)	0.8303
The time it takes to discuss HPV vaccination with patients and/or parents	93 (27.1)	26 (35.6)	4 (33.3)	0.3031
Adding another vaccine to the vaccine schedule	115 (33.5)	21 (28.8)	3 (25.0)	0.6668
Lack of information about the quadrivalent HPV vaccine	119 (34.7)	20 (27.4)	4 (33.3)	0.4918
Concerns about vaccine efficacy	105 (30.6)	19 (26.0)	2 (16.7)	0.4748
Personal discomfort discussing sexuality/sexually transmitted infections with parents	25 (7.3)	9 (12.3)	0 (0.0)	0.2385
Personal discomfort discussing sexuality/sexually transmitted infections with teens	22 (6.4)	9 (12.3)	0 (0.0)	0.1468

Table 3

Statistically significant barriers by VFC provider status, adjusting for other provider factors

Barrier ^a	VFC Yes OR (95% CI)	VFC No OR (95% CI)	VFC Don't Know OR (95% CI)
Lack of adequate reimbursement (non-payment or partial payment) for HPV vaccine	1.0 (Reference)	2.6 (1.1–5.8)	2.0 (0.5–7.5)
Lack of timely reimbursement for HPV vaccination	1.0 (Reference)	1.9 (0.9–4.2)	2.3 (0.6–8.8)
The cost of stocking HPV vaccine	1.0 (Reference)	1.9 (0.9–4.0)	1.3 (0.4–4.7)
Concerns about vaccine safety	1.0 (Reference)	0.7 (0.3–1.6)	0.4 (0.1–1.5)

^a Adjusted for provider specialty and number of years since completion of residency training