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## Views on HPV and HPV Vaccination: The Experience at a Federal Qualified Clinic in Puerto Rico

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### Abstract

**Objective**—The purpose of this study was to understand through a quantitative assessment, the views of HPV and HPV vaccination among parents of sons from a FQHC in PR.

**Methods**—A self-administered questionnaire was given to a convenience sample of 200 parents of sons 9–17 years old.

**Results**—Nearly 30% of the parents reported that their sons had initiated the HPV vaccine regimen. Health care provider recommendation was significantly associated with vaccine initiation. Among parents of unvaccinated sons, the main reason for not getting the HPV vaccine was they did not know that boys were allowed to get the vaccine.

**Conclusions**—Future efforts should focus on multilevel interventions aimed to increase knowledge as well as other modified behavioral determinants in parents of young males about HPV and the vaccine. Capacity building efforts should be targeted also to increase health providers' education and communication skills to promote HPV vaccination effectively.

## Keywords

Hispanic; HPV vaccine; mothers; males

Human papillomavirus (HPV) is the principal cause of cervical cancer among women and it is also the most common sexually transmitted infection (STI) among adults.<sup>1,2</sup> Among men, several studies have reported that oncogenic (high-risk) HPV types may be responsible for HPV-related cancers such as oropharyngeal, anal, and penile cancer.<sup>3,4</sup> Studies in Puerto Rico (PR) have reported an increased risk of penile cancer in men compared with other racial/ethnic groups in the United States (U.S.),<sup>5</sup> as well as an increased incidence trend of anal cancer of 26.9%, comparing the period of 2001–2004 to that of 1992–1996.<sup>6</sup>

Although vaccination is an effective way to prevent the infection, vaccination rates remain low,<sup>7</sup> with only 34.6% of young males aged 13–17 having received at least one dose in the U.S.<sup>8</sup> In PR, similar low rates are observed, with only 28% of young males in Puerto Rico aged 11–18 years having received at least one dose.<sup>9</sup> This low rate is observed even though state law mandates health insurers to cover the HPV vaccine for both girls and boys aged 11–18 years.<sup>10</sup> Among the vulnerable and underserved populations in Puerto Rico, young men who attend a federally qualified health center (FQHC) clinic might provide an opportunity to increase HPV vaccination rates on the island. As in the U.S., FQHCs serve uninsured and minority populations<sup>11</sup> who cannot use private-pay facilities.<sup>12</sup> In Puerto Rico, as in the U.S., the Vaccine for Children Program<sup>13</sup> provides vaccines at no cost to children who might not otherwise be vaccinated because of inability to pay. Aside from this program, Law 9, 2010 requires all health insurance companies to include the HPV vaccine for both girls and boys aged 11–18 years as part of their coverage plans.<sup>10</sup>

Given that the HPV vaccine is most effective if given prior to HPV exposure through sexual contact,<sup>14</sup> vaccination promotion strategies for young males and their parents are essential. Parents play an important role in the decision-making process of HPV vaccination,<sup>15</sup> although most of them feel that they do not have adequate information about HPV or the vaccine to make an informed decision about vaccinating their children.<sup>16</sup> Studies have identified reasons why parents have not vaccinated their children, including: believing the HPV vaccine is not necessary, having concerns over side effects, lacking or having insufficient knowledge about the vaccine, and lack of recommendations from health care

providers.<sup>17–19</sup> Therefore, enhancing knowledge in parents—particularly Hispanics/Latinos—about HPV and the vaccine will help increase vaccination rates among young males.

The purpose of this study was to identify correlates of HPV vaccine initiation, determine reasons why parents have not vaccinated their sons, and finally, explore preferences in delivery channels for educational messages that might influence the HPV vaccine uptake in young Hispanic/Latino males attending an FQHC clinic in Puerto Rico. Given that 94.9% of the young male (11–18 years old) patients participating in our study at an FQHC clinic are covered by the government health insurance program, Mi Salud,<sup>20</sup> the HPV vaccine is accessible to the vast majority of them at no cost. Thus, promoting vaccination awareness in this setting among parents might lead to increased vaccination rates among this group.

## Methods

A cross-sectional study with 200 consecutive parents/legal guardians (hereafter referred to as “parents”) of young males aged 9–17 years were recruited from March through June 2013 in the HealthproMed Clinic-Barrio Obrero in Santurce, San Juan, PR (part of the FQHC network in Puerto Rico). Participants were recruited through announcements and flyers by the study coordinator and research assistant. The flyer contained information regarding the study aims, eligible criteria, and staff contact information. Eligible criteria for this study were (a) being 21 years or older, and (b) a parent of at least one young male between 9–17 years of age. If both parents were eligible to participate in the study, only one parent was allowed to complete the questionnaire, in which case the decision about which one was made by the parents. Once identified and after spoken consent to participate in the study, participants were given an information sheet with the study aims, procedures, and its benefits and risks. No personal identifying information of the participants was gathered; therefore, no written consent process was performed. Then, the recruiter distributed the questionnaire to each subject. After finishing the questionnaires, parents were given reading material about HPV and the vaccine.

The self-administered questionnaire was provided in paper form and consists of 54 questions designed to obtain information from each participant about their knowledge, attitudes, willingness, and barriers regarding the HPV vaccine. The questionnaire was translated into Spanish, modified and culturally adapted for the Hispanic population in PR from the “HPV Immunization in Sons (HIS) Study: Baseline Parent Survey” developed by Reiter et al.<sup>21</sup> The entire procedure (information sheet, recruitment, and survey completion) took approximately 30 minutes, and the questionnaires were then given back to the recruiter once they were completed. The study protocol was approved by the Institutional Review Board of the University of Puerto Rico, Medical Sciences Campus.

## Statistical Analysis

Descriptive statistics were performed to characterize the study population. To evaluate the self-administered questionnaire variables in the bivariate analysis, HPV vaccine initiation was chosen as the dependent variable, and selected parents’ and sons’ characteristics as independent variables. HPV vaccine initiation was assessed in terms of whether the parents reported that their sons had received one or more doses of the HPV vaccine. Parents’

characteristics included age, gender, place of birth, education, and marital status. Similarly, information from the parents regarding whether or not they had heard about the HPV infection or the HPV vaccine for males, as well as if they had asked a health care provider for or received a health care provider recommendation to get their sons HPV vaccinated, were selected as independent variables. Data on whether parents had at least one daughter (9–26 years old) who had received the HPV vaccine, were also gathered. Sons' characteristics included age, whether they had visited a health care provider in the last year, and their health care coverage. Information about household characteristics such as family annual income was also assessed. Other characteristics evaluated included parents' reasons for not getting the HPV vaccine for their sons (among only parents of unvaccinated sons) and preferred channels of delivery for educational messages to promote the HPV vaccination of young Hispanic/Latino males. The parents' reasons for not getting the HPV vaccine as well as the preferred channels of delivery for educational messages were included in the survey as multiple choice questions with an open-ended response option provided. Simple logistic regression was done to evaluate selected characteristics and HPV vaccine initiation. Those variables that achieved statistical significance ( $p < .05$ ) in the bivariate analysis were then included in a multivariate logistic regression model to produce adjusted odds ratios (ORs) and 95% confidence intervals (CI). Although, parents' gender resulted in being statistically significant in bivariate analyses ( $p < .05$ ), it was not included in multivariate regression models due to empty cells, because only one father reported that his son had initiated the HPV vaccine compared with mothers ( $n=53$ ). Also, sons' age was included in the multivariate regression model as a continuous variable because it gave more reliable and accurate estimates. Statistical analyses were performed using the statistical package SPSS (Version 21.0, Chicago, IL).

## Results

### Parents and sons' characteristics

The mean age of the recruited parents was  $37.7 \pm 7.2$  years. The vast majority were females (88.5%), born in Puerto Rico (65.3%), and reported educational attainment of high school or less (57.4%). Almost half reported being married or cohabitating (49.7%) and the familiar annual income was \$5,000 or less (48.8%) (Table 1). Regarding sons' characteristics, their mean age was  $12.5 \pm 2.6$  years. Most of the parents reported that their sons had visited a health care provider in the last year (78.1%) and that they had some type of health care coverage (75%).

Around a third of the parents reported that their sons had initiated the HPV vaccine regimen (29.3%) (Table 2). Most parents have heard about the HPV infection (88.1%), and 62.4% had heard about the HPV vaccine administration in males. More than one-third of the parents reported that they had asked a health care provider (35.6%) and received a health care provider recommendation (34.3%) to get their sons the HPV vaccine. Almost one-half had at least one daughter (9–26 years old) who had gotten the HPV vaccine (48%). Among those parents of unvaccinated sons, more than 70% were willing to get their sons vaccinated in the near future (71.3%). In addition, more than one-half of the parents (54.6%) indicated

their willingness to vaccinate their sons even if they were required to pay a deductible (\$10 per dose for this FQHC clinic).

### **Correlates with HPV vaccine regimen initiation**

Descriptions of the initiation of the HPV vaccine by study characteristics and bivariate analyses are presented in Table 3. It is reported in the bivariate analyses that fathers were 88% less likely to report that their sons had initiated the HPV vaccine regimen (OR= 0.12; 95% CI= 0.02–0.90) compared with mothers. Parents who reported that they had asked a health care provider to get their sons the HPV vaccine were 10 times more likely to have a son who had initiated the HPV vaccine regimen (OR= 10.50; 95% CI= 4.97–22.19) compared with those parents who reported that they had not asked a health care provider about the vaccine. Similarly, those parents who reported that had received a health care provider recommendation to get their sons the HPV vaccine were 34 times more likely to have a son who had initiated the HPV vaccine regimen (OR= 34.03; 95% CI= 13.56–85.39) compared with those parents who reported that had not received a health care provider recommendation about the vaccine. Parents who reported having at least one daughter between 9–26 years of age who had received the HPV vaccine were six times more likely to report that their sons had initiated the HPV vaccine regimen (OR= 6.46; 95% CI= 2.50–16.69) compared with those parents who reported that they had daughters who had not received HPV vaccine. On the other hand, parents who reported that their sons were between 13 and 15 years old were more than four times as likely to indicate that their sons had initiated the HPV vaccine regimen (OR= 4.40; 95% CI= 2.15–9.02) compared with younger boys (9–10 years old).

In the multivariate analysis, after adjusting by son's age, asking a health care provider, and receiving a health care provider recommendation to get their sons vaccinated, as well as having a daughter 9–26 years old who had received the vaccine, all remained statistically significant ( $p < .05$ ) (Table 4). Those parents who reported that they had asked a health care provider (OR= 6.49; 95% CI= 1.23–34.36) and received a health care provider recommendation (OR= 13.04; 95% CI= 2.06–82.74) to get their sons the HPV vaccine, as well as having a daughter among 9–26 who had received the HPV vaccine (OR= 4.94; 95% CI= 1.09–22.41), were more likely to have initiated the HPV vaccine regimen in their sons compared with their counterparts.

### **Reasons why parents have not vaccinated their sons with the HPV vaccine**

Among parents of unvaccinated sons ( $n=125$ ), the main reason for not getting the HPV vaccine was because they did not know that boys were allowed to get the vaccine (41.6%). Similarly, parents reported that they had never heard about the HPV vaccine before (31.2%), they did not know enough about the vaccine yet (23.2%), and that their sons were not having sex yet (17.6%) (Table 5).

### **Preferred channels of delivery for educational messages**

The majority of surveyed parents (94%) considered that a physician and/or a health care professional should educate parents of young males (9–17 years) with informative messages about the HPV vaccine. More than one-half (59.2%) answered that a teacher or a health

educator might also be effective in giving those educational messages. Additionally, most of the parents considered that educational messages about HPV vaccination should be delivered through advertisements and educational TV programs (84.9%). Another 72.6% considered social networks (via the internet) to be an effective channel of delivery for HPV vaccination promotion (Figure 1).

## Discussion

In this study, only 29.3% of the parents attending this FQHC in San Juan, PR reported that their sons had received at least one dose of the HPV vaccine. Although comparisons are difficult to achieve due to differences in the venue or methodology used, estimates from this study are similar compared with PRIR (Puerto Rico Immunization Registry) estimates of HPV vaccination initiation for 2013 among young boys (28%).<sup>9</sup>

The majority of the parents of unvaccinated sons indicated a willingness to vaccinate them, which is consistent with previous reports.<sup>22</sup> Differences in awareness of HPV and the possibility to vaccinate their sons were notable, highlighting opportunities to increase vaccination uptake if targeted interventions among this group are delineated. Findings from our study reveal differences in initiation of the HPV vaccine based on the son's age. Parents who reported that their sons were between 13 and 15 years old were more likely to indicate that their sons had initiated the HPV vaccine regimen compared with younger boys (9–10 years old). Other studies have reported similar findings.<sup>23–25</sup> For instance, in a study from the 2010 Child Health Assessments and Monitoring Program (CHAMP), it was reported that HPV vaccine initiation was more than three times higher for boys who were older (13–15 years vs. 11–12 years).<sup>23</sup> Another study found similar findings among White, Black and Latino parents reported after multivariate analysis.<sup>25</sup> The results from our study, as well as previous studies which report similar trends, warrant the necessity to strengthen efforts in suggesting vaccination administration based on recommendations from the Advisory Committee on Immunization Practices (ACIP).<sup>7</sup>

In our study, parents who reported that they had asked a health care provider or received a health care provider recommendation to get their sons the HPV vaccine were more likely to have a son who had initiated the HPV vaccine. This finding has been repeatedly identified in the literature.<sup>26–28</sup> For example, a study assessing HPV vaccine initiation in adolescent boys (13–17 years old) from the 2010 & 2011 National Immunization Survey-Teen (NIS-Teen) reported that, after multivariate analysis, those parents who reported receiving a health care provider recommendation to get their sons the HPV vaccine were almost 20 times more likely to have a son that had initiated the HPV vaccination.<sup>27</sup> Similar findings here were observed using the 2009 NIS-Teen data.<sup>28</sup>

Another study including data from the 2007 National Survey of Children's Health (NSCH) about adolescent females (12–17 years old), identified that parental report of a health care provider recommendation of the HPV vaccine was associated with about 18 times the adjusted odds of initiating the HPV vaccine series.<sup>26</sup> Therefore, since efforts to increase HPV vaccination are possible in this venue due to access and availability of the vaccine for



this group, efforts to improve provider-level communication and recommendation of the HPV vaccine are warranted.

Another important predictor of HPV initiation in our study was having a daughter who had been previously vaccinated. In this study, 48% of the parents reported having at least one vaccinated daughter younger than 26 years old. Reasons for this could be mediated due to the exposure of information regarding HPV vaccine for their daughters, which might help parents understand the short- and long-term consequences of the infection and how HPV affects both genders. Based on our extensive search, only one study used data from a sample of mothers of adolescent females, aged 11–14 years. The investigators reported, after multivariate analysis, that mothers were more willing to get their sons free HPV vaccine if their adolescent daughters had received any doses of HPV vaccine ( $\beta = 0.15$ ).<sup>29</sup> Targeting interventions that promote HPV vaccine to parents of daughters who have initiated the HPV vaccination may be an excellent opportunity to increase vaccination rates in young males. Subsequently, these parents may serve as HPV vaccine promoters to other parents with sons.

Regarding reasons why parents have not vaccinated their sons, data from this study identified that the main reason was because they did not know that boys were allowed to get the vaccine. Findings are consistent to those reported in other studies, although percentages may vary drastically.<sup>23,30</sup> For example, the Behavioral Risk Factor Surveillance System (BRFSS) and the CHAMP, reported that 17% of parents of unvaccinated boys reported being unaware that the HPV vaccine was available for their sons.<sup>22</sup> Another study using the HIS study data and collecting information on vaccine uptake and acceptability among parents and their sons (11–17 years old) identified that 80% of parents of unvaccinated sons were unaware that the HPV vaccine can be given to males.<sup>30</sup> Therefore, opportunities to increase awareness in this venue in which the vaccine will be free of charge will help in increasing vaccination rates for boys.

In relation to our results about preferred channels of delivery for educational messages, almost all of the surveyed parents considered that a physician and/or a health care professional should educate them and other parents about the HPV vaccine. This is similar to a study that interviewed parents attending an urban academic center and a community health center which concluded that 88% of parents preferred to receive vaccine information through speaking directly with their physicians.<sup>23</sup> Also, most of the parents from our study considered that educational messages about HPV vaccination should be delivered through advertisements and educational TV programs and on the internet. This finding is similar to the results of a study that identified that 70% of Latino parents surveyed preferred the TV/news/internet as their primary source of HPV vaccine information.<sup>31</sup>

To our knowledge, this is the first study that identifies factors associated to HPV vaccine initiation among Hispanic/Latino young males in Puerto Rico; however, these results should be interpreted with caution. The study was performed in a FQHC located in a low-income neighborhood in Santurce, PR and might not represent the overall population that attends other FQHCs around the Island or the Puerto Rican general population. Nevertheless, this clinic receives a great amount of patients yearly, providing primary care services not only to Puerto Ricans, but also to other Hispanic groups such as those from the Dominican

Republic. Hence, this FQHC could be an excellent setting to promote the HPV vaccination among health care providers and patients.

Information about HPV vaccine completion (have completed the 3 doses) was not gathered in this study. Therefore, whether these adolescent males had or had not completed the HPV vaccine administration could not be established. However, information from the FQHC clinic of the prevalence for HPV vaccine completion in this clinic was gathered. Future studies should assess both HPV vaccine initiation and completion to establish a better understanding of the factors that might influence the HPV vaccination in males. Additionally, because this was a cross-sectional study, it cannot be predicted if parents that reported having unvaccinated sons ultimately got the vaccine for them after participation.

A small number of fathers were recruited in this study. Future studies should adopt a random assignment in the event that both parents are eligible to participate. Finally, because it was a self-administered questionnaire and given that parents' self-reported responses were used to assess HPV vaccination in young boys, there will be some recall bias giving an underestimation of the main outcomes. Therefore, gathering information from the health care provider records about HPV vaccination (initiation and/or completion) and if the vaccine regimen was correctly completed, could give more reliable estimates of the HPV vaccine uptake. Future studies on these groups should take into consideration this strategy along with self-reported measures.

Based on our findings and despite our limitations, future efforts in HPV vaccine promotion should focus on educational campaigns aimed to increase knowledge in parents of young males about HPV and the vaccine, as well as in capacity building strategies for health care providers designed to increase education and communication with parents and their sons.

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## Abbreviations

<b>ACIP</b>	Advisory Committee on Immunization Practices
<b>BRFSS</b>	Behavioral Risk Factor Surveillance System
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CHAMP</b>	Child Health Assessments and Monitoring Program
<b>FDA</b>	Food and Drug Administration



<b>FQHC</b>	Federally Qualified Health Center
<b>HIS</b>	HPV Immunization in Sons
<b>HPV</b>	Human Papillomavirus
<b>NIS</b>	National Immunization Survey
<b>NSCH</b>	National Survey of Children's Health
<b>PR</b>	Puerto Rico
<b>PRIR</b>	Puerto Rico Immunization Registry
<b>STI</b>	Sexually transmitted infection
<b>U.S</b>	United States
<b>VFC</b>	Vaccines for Children

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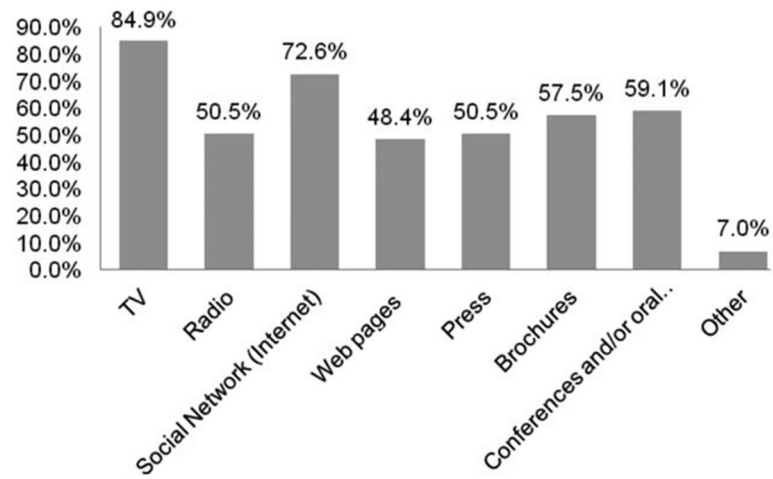
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**What's New**

Given that the burden of HPV-related cancers in Puerto Rican men is already documented, understanding HPV vaccine initiation and parents' willingness to vaccinate their sons are necessary. Since willingness is high and predictors of HPV initiation are modifiable, future studies should develop targeted interventions aimed to increase HPV vaccine uptake.



**Figure 1.**

Which type of media do you consider would be more effective to educate parents of young boys (9–17 years) with educational messages about the HPV vaccine?

**Table 1**

Characteristics of parents and adolescent sons.

Variable	Total (%) (n=200)
<b>Parent characteristics</b>	
<b>Age (years)</b>	
21 – 29	17 (8.7%)
30 – 39	118 (60.2%)
40+	61 (31.1%)
Mean $\pm$ SD	37.7 $\pm$ 7.2
<b>Gender</b>	
Female	177 (88.5%)
Male	23 (11.5%)
<b>Place of Birth</b>	
Puerto Rico	130 (65.7%)
United States	8 (4.0%)
Dominican Republic	60 (30.3%)
<b>Educational Level</b>	
<High School	52 (26.4%)
High School	61 (31.0%)
> High School	84 (42.6%)
<b>Marital Status</b>	
Single, never married	61 (30.5%)
Married/cohabitating	98 (49.7%)
Divorced or separated	38 (19.3%)
<b>Son characteristics</b>	
<b>Age (years)</b>	
9 – 10	56 (30.3%)
11 – 12	48 (25.9%)
13 – 15	48 (25.9%)
16 – 17	33 (17.8%)
Mean $\pm$ SD	12.5 $\pm$ 2.6
<b>Visited healthcare provider in last year</b>	
No	40 (21.9%)
Yes	143 (78.1%)
<b>Healthcare coverage</b>	
No	48 (25.0%)
Yes	144 (75.0%)
<b>Household characteristics</b>	
<b>Familiar Annual Income</b>	
< \$5,000	79 (48.8%)
\$5,000 – 14,999	57 (35.2%)
\$15,000	26 (16.0%)



**Table 2**

HPV infection knowledge and vaccine willingness.

Variable	Total (%) (n=200)
<b>Is your son vaccinated against HPV? ***</b>	
No	130 (70.7%)
Yes	54 (29.3%)
<b>Have you heard about the HPV infection **</b>	
No	23 (11.9%)
Yes	171 (88.1%)
<b>Have you heard about the HPV vaccine for males before? **</b>	
No	71 (37.6%)
Yes	118 (62.4%)
<b>Asked a provider to get son HPV vaccine</b>	
No	123 (64.4%)
Yes	68 (35.6%)
<b>Received provider recommendation to get son HPV vaccine</b>	
No	119 (65.7%)
Yes	62 (34.3%)
<b>Daughter(s) (9–26 years old) got the HPV vaccine (n=98)</b>	
No	51 (52.0%)
Yes	47 (48.0%)
<b>Have thought about getting your son vaccinated against HPV before? **** (among those who have not vaccinated their sons)</b>	
No	93 (72.1%)
Yes	36 (27.9%)
<b>How do you feel about getting your son vaccinated against HPV in the next year (2014)? ** (among those who have not vaccinated their sons)</b>	
I don't want him to be vaccinated	5 (3.9%)
I want him to be vaccinated	92 (71.3%)
Don't know	32 (24.8%)
<b>Willingness on getting their sons vaccinated against HPV (if it's for free) * (among those who have not vaccinated their sons)</b>	
Definitely not willing	1 (0.8%)
Probably not willing	0
Not sure	26 (20.2%)
Probably willing	22 (21.5%)
Definitely willing	80 (62.0%)
<b>Willingness on getting their sons vaccinated against HPV (if it's \$10 per dose) *** (among those who have not vaccinated their sons)</b>	
Definitely not willing	3 (2.3%)
Probably not willing	3 (2.3%)
Not sure	25 (19.2%)
Probably willing	28 (21.8%)
Definitely willing	71 (54.6%)

**Table 3**

Factors associated with HPV vaccine initiation

Variable	Bivariate OR (95% CI)
<i>Overall</i>	
<i>Parent characteristics</i>	
Age (years)	
21 – 29	1.00
30 – 39	0.90 (0.47–1.71)
40+	1.54 (0.78–3.01)
Gender *	
Female	1.00
Male	0.12 (0.02–0.90)
Place of Birth (US was excluded)	
Puerto Rico	1.00
Dominican Republic	1.34 (0.68–2.65)
Educational Level	
<High School	1.00
High School	0.48 (0.23–1.03)
> High School	1.80 (0.95–3.41)
Marital Status	
Single, never married	1.00
Married/cohabitating	0.90 (0.48–1.70)
Divorced or separated	1.82 (0.84–3.91)
No	1.00
Yes	10.50 (4.97–22.19)
No	1.00
Yes	34.03 (13.56–85.39)
No	1.00
Yes	6.46 (2.50–16.69)
Asked a provider to get son HPV vaccine	
Yes	10.50 (4.97–22.19)
Received Provider recommendation to get son HPV vaccine	
Yes	34.03 (13.56–85.39)
Daughter(s) (9–26 years old) got the HPV vaccine	
Yes	6.46 (2.50–16.69)
<i>Son characteristics</i>	
Age (years) *	
9 – 10	1.00
11 – 12	1.17 (0.56–2.43)
13 – 15	4.40 (2.15–9.02)
16 – 17	1.25 (0.54–2.88)
Healthcare coverage	

Variable	Bivariate OR (95% CI)
Yes	1.36 (0.63–2.95)
<i>Household characteristics</i>	
<b>Familiar Annual Income</b>	
< \$5,000	1.00
\$5,000 – 14,999	1.02 (0.51–2.04)
\$15,000	0.87 (0.34–2.21)

\*  
p<.05

**Table 4**Multivariate model for HPV vaccination among adolescent males<sup>a</sup>

Variable	Adjusted OR (95% CI)
<i>Parent characteristics</i>	
Asked a provider to get son HPV vaccine	
No	1.00
Yes	6.49 (1.23–34.36)
Received provider recommendation to get son HPV vaccine	
No	1.00
Yes	13.04 (2.06–82.74)
Daughter(s) (9–26 years old) got the HPV vaccine	
No	1.00
Yes	4.94 (1.09–22.41)

<sup>a</sup>Model adjusted by son's age (continuous variable), asking a provider and provider's recommendation to get son HPV vaccine, and daughter(s) (9–26 years old) got the HPV vaccine.

**Table 5**Reason why parents have not vaccinated their sons with the HPV vaccine<sup>a</sup> (N=125)<sup>b</sup>

Reasons	N (%)
I never heard of the vaccine	39 (31.2%)
I don't know enough about it yet	29 (23.2%)
I didn't know boys are allowed to get the vaccine	52 (41.6%)
It's too new	8 (6.4%)
It might be unsafe	4 (3.2%)
It costs too much	3 (2.4%)
Boys don't need to get the vaccine	3 (2.4%)
My son is too young	12 (9.6%)
My son is not having sex yet	22 (17.6%)
It might make my son have sex	1 (0.8%)
My son hasn't been to a doctor recently	9 (7.2%)
His doctor didn't recommend getting the vaccine	5 (4.0%)
Other reasons	13 (10.4%)
Don't know	10 (8.0%)

<sup>a</sup>Not mutually excluded<sup>b</sup>Among parents of unvaccinated sons (n= 125; missing= 5)