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## Parents' opinions of mandatory Human Papillomavirus (HPV) vaccination: does ethnicity matter?

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## Abstract

**Objective**—To explore parents' opinions of school-entry requirements for Human Papillomavirus (HPV) vaccination.

**Methods**—We interviewed parents of vaccine-eligible girls attending medical appointments in an urban academic medical center and an affiliated community health center. We used qualitative methods to explore parents' opinions about mandating routine childhood vaccines and HPV vaccine, as well as their feelings about vaccinating their own daughters against HPV.

**Results**—19 Caucasian, 18 African-American, 12 Afro-Caribbean, 3 African, and 21 Latino parents participated. Nearly all parents had allowed their children to receive routine vaccinations and expressed support for mandating these vaccines. Most parents also vaccinated their daughters against HPV: 100% of Caucasian parents, 90% of African-American parents, 73% of Afro-Caribbean/African parents, and 90% of Latino parents. Only 11% of Caucasian parents supported HPV vaccine mandates, however, compared with 78% of African-American, 60% of Afro-Caribbean/African and 90% of Latino parents. Immigrants supported mandates more frequently than U.S.-born parents. Most Caucasian parents opposed mandatory HPV vaccination because they believed the HPV vaccine should be an individual decision as the virus could only be spread

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by sexual contact. African-American, Afro-Caribbean, African and Latino parents generally viewed mandates as the most effective way to protect their daughters from cervical cancer. Latino parents gave special importance to protecting their daughters from sexually transmitted infections.

**Conclusions**—Parents from different racial and ethnic backgrounds expressed unique perspectives about mandatory HPV vaccination, and Caucasians were less likely than parents of other races/ethnicities to support vaccine mandates.

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## INTRODUCTION

Over 11,000 women in the United States develop cervical cancer each year, and an additional 330,000 women annually undergo surgical procedures to remove precancerous lesions of the cervix (American Cancer Society 2008; Schiffman and Solomon 2003). Human Papillomavirus (HPV) causes nearly all cases of cervical cancer and precancer, and vaccines have been developed that protect against the most common oncogenic HPV types (Markowitz, Dunne et al. 2007). In 2006, HPV vaccine was added to the list of recommended adolescent vaccines for females by the Centers for Disease Control and Prevention (Markowitz, Dunne et al. 2007), and was subsequently endorsed by the American Academy of Pediatrics (American Academy of Pediatrics, 2006), the American Academy of Family Physicians (American Academy of Family Physicians, 2006), and the American College of Obstetricians and Gynecologists (American College of Obstetricians and Gynecologists, 2006). In the wake of these recommendations, 24 states and Washington D.C. introduced legislation specifically to mandate HPV vaccination for school entry (National Conference of State Legislatures, 2009). However, opposition to vaccination against a sexually transmitted infection and controversy arising from heavy lobbying of state legislatures by Merck & Company Inc. led most states to abandon efforts to mandate vaccination. Currently, only Virginia and Washington D.C. require HPV vaccination for school entry (National Conference of State Legislatures, 2009), and recent surveys indicate that only 37% of all eligible girls **in the U.S.** have received HPV vaccination (NIS-Teen, 2010).

School entry mandates raise complex ethical and political challenges. Ethical analyses of compulsory vaccination have focused on tensions between maximizing public health benefits and respecting parental autonomy with regards to medical decision-making for their daughters (Colgrove 2006; Zimmerman 2006; Charo 2007; Balog 2009). Prior experience with varicella and Hepatitis B vaccination indicates that requiring vaccination for school entry leads to greater public uptake of vaccine recommendations (Davis and Gaglia 2005; Morita, Ramirez et al. 2008). Mandating vaccinations has also been shown to reduce racial disparities in both vaccination rates (Morita, Ramirez et al. 2008) and rates of vaccine-preventable disease (Flannery, Schrag et al. 2004). African-American and Latina women develop cervical cancer more frequently and are more likely to die from the disease than Caucasian women in the United States (Surveillance, Epidemiology and End Results, 2009), thus mandated vaccination may reduce health disparities. Yet, because HPV cannot be transmitted by casual social contact, others believe that the benefits of mandating HPV vaccination do not justify the infringement on parental autonomy (Colgrove 2006).

Most parents express favorable opinions toward HPV vaccination for their own daughters (Zimet, Liddon et al. 2006; Constantine and Jerman 2007; Marlow, Waller et al. 2007), although vaccine acceptability may vary by race/ethnicity, with Latinas expressing more favorable attitudes than African-Americans in some studies (Constantine and Jerman 2007; Scarinci, Garces-Palacio et al. 2007). However, public opinion polls indicate that only one third of parents support mandates, (Survey of Illinois adults, by Institute of Government and Public Affairs at University of Illinois, 2009; National Poll on Children's Health, 2009;

Milhausen, 2008), and racial/ethnic differences have not been explored. The current discussion remains limited by the absence of parents' explanations of their opinions regarding mandatory vaccination. We used qualitative interviews to explore parents' attitudes about school-related mandatory HPV vaccination, and to determine whether parents of different racial/ethnic backgrounds expressed distinct views about mandatory vaccinations.

## METHODS

### Study Population and Procedure

We interviewed parents or legal guardians of vaccine-eligible girls aged 11–18 years who presented for preventive care or problem-related visits in the Pediatric, Adolescent, or Obstetrics and Gynecology practices in an urban academic medical center and an affiliated community health center **in Boston, Massachusetts**. Interviews were completed between June 2007 and February 2008. The practice schedules of the busiest primary care pediatric, adolescent, and obstetrics-gynecology clinics were reviewed (2 days/week), a total of 55 interview days during the study period. Mothers, fathers, or legal guardians who spoke English or Spanish were eligible for inclusion. Trained research assistants reviewed practice schedules to determine eligible patients and recruited parents in the waiting areas before scheduled visits. To explore the influences of race and ethnicity on parents' views, we performed purposive sampling of African-American, non-Latino Afro-Caribbean or African, Caucasian, and Latino parents/legal guardians. Interviews were conducted in both English and Spanish by native speakers. Interview guides were translated into Spanish and then back-translated to ensure equivalent meanings. Responses to qualitative questions were audiotaped and transcribed. Spanish responses were transcribed in Spanish, translated to English by one bilingual investigator, and then reviewed by a second bilingual investigator to ensure the adequacy of translation. Participants received a \$15 gift certificate as compensation for their participation. This study was approved by the IRB at [blinded by WHI editors].

### Interview Design

Interview guides were designed to elicit demographic information, parental intention to vaccinate against HPV, and parents' opinions about mandating routine childhood vaccines and HPV vaccine. While many vaccinations are mandated for entry into Massachusetts public schools, HPV vaccination is not currently required for school entry. Therefore, parents were asked how they would feel about requiring the HPV vaccine. Demographic and personal history information included parent's self-identified ethnicity, age, years of education, marital status, country of origin, years in United States (if foreign-born), primary language, religious affiliation and frequency of service attendance (if affiliated), the relationship of the parent/guardian to the vaccine-eligible girl and the age of the vaccine-eligible girl, previous history of declining a recommended vaccine, and personal experience with abnormal Pap tests, genital warts, or cervical cancer. Intention to vaccinate was assessed by asking parents to rate their likelihood of accepting vaccination for their daughters on a 4-point scale. Qualitative questions were developed on the basis of research by Mays and colleagues (2004) and tailored for cultural relevance to our sample of parents. Questions included: "How do you feel about requiring children to get certain vaccines?" and "How do you feel about requiring children to get the HPV vaccine in order to go to school?" In each instance, parents were asked to explain their opinions. To determine the correlation between parents' statements about HPV vaccination and their actions with regards to their own daughters, electronic medical records were reviewed twelve months following the interview date to determine whether the daughters had actually received HPV vaccination.

## Data Analysis

Qualitative data were analyzed using methods informed by grounded theory and content analysis. Common themes, issues, and language usage were noted and placed into broader coding categories based on similarity of content. Content and language categories were evaluated to assess if generalizations could be made. The analysis was accomplished through an iterative process with four of the investigators at turns working independently and collaboratively, with final interpretive decisions produced through consensus arbitrated by a fifth investigator. Because the qualitative analysis was our primary outcome, we recruited parents only until we reached thematic saturation. As our sample size was small, we performed a limited quantitative statistical analysis. Descriptive statistics were used to analyze demographic data. Bivariate analysis was performed using SAS statistical software Version 8.2 (SAS Institute Inc., Cary, North Carolina, U.S.A.) to explore relationships between demographic factors and support for vaccine mandates.

## RESULTS

Ninety-four parents were approached, and 73 agreed to participate (19 Caucasian, 18 African-American, 15 Afro-Caribbean, 3 African, 21 Latino; Table 1). The most common reason for declining to participate was time constraints. Parents ranged in age from 31–60 years, and their daughters' average age was 15. Most parents were mothers and had completed high school; approximately half were married. Consistent with the populations Boston Medical Center serves, 45% of the parents were born outside of the United States and over one third did not speak English as their primary language. Most expressed a religious affiliation, the majority of whom were Catholic, and nearly half attended services at least weekly. Only 23% of patients (n=17) had private insurance; the remainder used public insurance (n=52) or were uninsured (n=4). Insurance status did not differ by race/ethnicity.

### Personal acceptance of vaccination and support for mandates

All but one parent (n=72) had allowed their children to receive routine childhood vaccinations, and all but two parents supported mandating childhood vaccinations for school entry. Parents also expressed high levels of support for HPV vaccination: 89% (n=65) intended that their daughters receive the HPV vaccine, and 86% (n=63) of all daughters were vaccinated within 12 months of the interview date. Vaccination rates were 100% among Caucasians (n=19), 90% among African-Americans (n=16), 73% among Afro-Caribbeans/ Africans (n=11), and 90% among Latinos (n=19); p=0.08.

Despite strong personal desire to vaccinate their daughters, however, only 62% of parents (n=45) were in favor of requiring HPV vaccination for school entry. Attitudes differed dramatically by ethnicity: only 11% (n=2) of Caucasian parents endorsed school-entry requirements, compared with 78% (n=14) of African-American parents, 60% (n=9) of Afro-Caribbean and African parents, and 90% of Latino parents (n=19); p<0.0001. Foreign-born parents were also more likely to support vaccine mandates than parents born in the United States (78% vs. 51%; p=0.01). Parents' attitudes regarding mandatory vaccination were not associated with education, religious affiliation, age of parent or child, marital status, personal experience with abnormal Pap smears, genital warts or cervical cancer, or having previously declined a recommended vaccine.

### Parents' explanations of their attitudes

The 71<sup>1</sup> parents who supported school-entry requirements for routine childhood vaccinations explained that they wished to protect their own children and other children from communicable diseases: “I just want to protect them. I have no problem with [requiring

vaccines], it's a safety issue.” (*African-American mother Participant 20*) One Latina immigrant mother (Participant 3-Spanish) recounted her personal experience: “I had measles and that causes terrible fever, and my body was like a complete rash and headaches, and that I wouldn't like to see in any child.” A Caucasian mother who worked as a preschool teacher (Participant 50) graphically illustrated her view of communicable diseases in schools: “I can tell you that they spit all over me.... They just blast it everywhere.”

Parents also understood the public health implications of requiring childhood vaccines: “You're not taking the chance just with your child, but with other kids. So it's going to protect your child and the other kids in the class.” (*Caucasian mother Participant 49*) A Latina mother (Participant 8-Spanish) said, “I am happy they made [the measles vaccine] mandatory because not everybody gives vaccines to their children and you never know.” A Caucasian mother (Participant 55) added, “I feel very strongly that everyone should be vaccinated before they're allowed into school. And if they don't, they should not be allowed into public school. That's why pertussis is making a comeback.”

Parents also raised the issue of vaccine affordability, recognizing that many insurers only covered mandated vaccines: “Last year when [my children] went to college [the meningitis vaccine] was their choice, and I couldn't get it cheap for anybody. And now the insurance paid for it.... I think everyone should get all the vaccines, whether they can afford them or not.” (*Caucasian mother Participant 46*) An African-American mother agreed (Participant 4): “I think all children need [vaccines]. Even if they can't afford them, they need them.”

**Attitudes favoring school-entry requirements for HPV vaccination**—Favorable attitudes regarding mandatory HPV vaccination were largely expressed by African-American, Afro-Caribbean, African, and Latino parents. Reasons given for supporting mandates most frequently related to cancer prevention and parents' wishes to protect their children from risks associated with sexual activity. Parents' arguments supporting and opposing HPV vaccine mandates are summarized in Table 2.

### Prevent cervical cancer

Parents who favored mandates felt that HPV vaccination was an important way to protect their children from developing cervical cancer: “I think they should be required to receive [HPV vaccination]. If it's going to help to prevent them from getting cervical cancer, why shouldn't they get it?” (*African-American mother Participant 3*) A Latina mother (Participant 7-Spanish) added, “At least I know she is not going to die because of cancer.” A Caucasian mother agreed (Participant 54) “I feel that they should get the HPV shot because if it's going to prevent these diseases and cancer, I think it's good.” An African-American mother (Participant 20) said, “I just want to protect our children from having cancer in the future.” Another Latina mother added (Participant 7-Spanish): “I don't have any problem [with mandates]. Things are better prevented before than after. Better safe than sorry.”

### Protect sexually active adolescents

Several African-American, Afro-Caribbean, African, and Latina mothers supported mandates out of concerns that adolescents were initiating sexual activity at an early age: “Some of these young children are doing things at a very young age they shouldn't be doing. So this is one way we can protect them.” (*African-American mother Participant 5*) By protecting girls from HPV, mandatory vaccination would provide peace of mind: “[With vaccination] you can prevent those diseases and also we feel good and calm because ...

<sup>1</sup>Two parents opposed mandatory childhood vaccinations: one thought that people should develop natural immunity to disease and opposed all vaccinations, and the other felt that vaccines could cause certain diseases in susceptible children.

nowadays kids are having sex at an early age.” (*Latina mother Participant 6-Spanish*) These mothers felt that mandatory HPV vaccination could protect their children even when they made sexual decisions against parental advice: “The parents are never with them, and for that small mistake of always believing 100% in what they say, that is the reason for so many diseases. It's better to believe 50% and do things to prevent further complications.” (*Latina mother Participant 2-Spanish*) “The children, these days they are very sexually active, so ... it's better for them to take the vaccine before they go to school.” (*Afro-Caribbean mother Participant 62*) “Because children, we can give them sexual education, give them advice. But they make their own decisions. Then, we can protect them from diseases by giving them the vaccine.” (*Latina mother Participant 7-Spanish*) “We are never exempt from our children making mistakes, those little mistakes, so it's better to be protected. (*Latina mother Participant 14-Spanish*)

### **Avoid stigma associated with sexually transmitted infections**

Latino parents expressed a unique view of the importance of vaccinating against HPV. Some parents stated that it was more important than routine childhood vaccinations because of the stigma associated with contracting a sexually transmitted infection: “The fact that it is a sexually transmitted infection, that is even more reason to make it a requirement.” (*Latina mother Participant 8-Spanish*) Latino parents also felt that if vaccination were universally required, they would not feel that their daughters were being singled out or stigmatized as needing vaccination against sexually transmitted infections: “If they have to [make the vaccine mandatory], they would let the parents know. Then I won't be the only one they talk to about it, they would talk with every parent of every child at the school.” (*Latina mother Participant 5-Spanish*) She went on to explain, “I would not go with someone that says that your daughter needs to get the vaccine but no one else is getting it, you know what I mean?”

### **Medical Innovation**

Another unique perspective expressed by Latino participants was favorable attitudes toward novel vaccines. Some parents of other races/ethnicities voiced concerns about side-effects of new vaccines, but none of our 21 Latino participants did so. One Latina mother (Participant 7- Spanish) explained that she wished to take advantage of medical innovations, “[If HPV vaccine were mandated, I would feel] grateful because we parents want the best for our children, and thank God science has discovered new medicines to prevent diseases.”

### **Public health intervention**

No U.S.-born parents mentioned public health benefits when discussing mandated HPV vaccination. In contrast, immigrant parents from low resource settings frequently saw public health benefits to mandatory vaccination: “It's prevention for the general population” (*Latina mother from Colombia, P5-Spanish*) A Cape Verdean mother (Participant 22) added: “I think it's really great, that we can save more people.” Another Colombian immigrant mother (Participant 11-Spanish) went so far as to state that she would feel “honored” if HPV vaccination were mandated. She felt that the public healthcare system in her home country neglected many basic needs, and thus viewed compulsory HPV vaccination quite favorably: “It's like [the government is] paying attention to your daughter.... If they are knocking on doors it's... so we can have a more healthy life, a better quality of life.”

**Attitudes against school-entry requirements for HPV vaccination**—Caucasian parents frequently expressed negative attitudes toward mandatory vaccination. Many argued that mandates were not justified because HPV can only be spread through sexual contact.

### Not transmissible by routine contact

Similar to minority parents, Caucasian parents felt that adolescents were often sexually active against parental advice, and many chose to vaccinate their own daughters for this reason: “[I would vaccinate my daughter] just for protection. I mean, you don't know what your child's going to do or how promiscuous they'll be. You hope they're not, but anything to save them.” (Participant 44) However, no Caucasian parents mentioned the ability to protect adolescents despite sexual risk-taking when discussing mandatory vaccination. Instead, several parents argued that HPV should not be mandatory because, unlike measles or other childhood diseases for which vaccination is required, HPV cannot be spread by casual contact: “I don't agree with [mandates] because... [HPV] is spread through a behavior, not through just social contact... A little first, or even a fifth grader sneezing on each other is different than an older child deciding to remove clothing.” (Caucasian mother Participant 50)

### Personal choice

Caucasian parents more frequently stated that HPV vaccination should be an option, not a requirement (9 statements from 19 Caucasian participants vs. 6 statements from 54 participants of other races/ethnicities). One Caucasian mother (Participant 44) said: “I don't think they should have to get it to go to school, because HPV is something that should be a choice. It shouldn't be a have to.” Another Caucasian mother (Participant 48) who did not have any personal objection to vaccination opposed mandates because she knew that other parents had different beliefs: “[The choice to vaccinate] is a religious thing for some people.” Another Caucasian mother (Participant 51) added, “I wouldn't want to push anything on anyone obviously that didn't feel comfortable.”

### Promotion of sexual activity

In addition, only Caucasian parents opposed mandatory vaccination because of concerns that HPV vaccination could promote adolescent sexual activity. This concern was raised by 3 of 19 Caucasian participants, but 0 of 54 African-American, Afro-Caribbean, African, and Latino parents. One Caucasian mother (Participant 45) explained, “Just seems like it's encouraging sexual activity. [An adolescent might think] ‘It's okay, I can do whatever I want because I'm not going to catch anything.’ It's like putting birth control in their oatmeal.” Another Caucasian mother (Participant 56) added, “You're almost telling your kid go ahead and have sex or start touching people.”

### New vaccine with potential unknown side-effects

Some parents felt uncomfortable with the newness of the vaccine and were concerned that side-effects could emerge in the future: “I'm not sure that enough is known about this vaccine to put it into that widespread use at this time. I would like to hear more about long term effects on people who use it.” (Caucasian father Participant 52) He then went on to add, “Once it's thoroughly proven and it's totally beneficial, I would be in favor.” An Afro-Caribbean mother (Participant 15) agreed that in a few years she might agree with requiring HPV: “By then the kids who have received it, they would have monitored and they would know if there are any long-term effects, you know, and the reactions to those vaccinations.” Several parents expressed the desire to learn more about HPV vaccination before accepting requirements. An Afro-Caribbean mother (Participant 12) stated that she opposed mandates because she thought the public should be better informed before the vaccine became a requirement:

“[The vaccine is] so new. I don't think a lot of people are informed enough about it. And I think ... you need to make information readily available through all sorts of media because, to reach the parents. Because that's who, you know, make a lot of

decisions in the lives of these kids.... And if there's not, if there's not nothing in Spanish, if there's nothing in French, there is nothing in Italian, if there is nothing in, you know, languages for the Asians, how are we going to reach those folks? And why make a difference in one group of people and not in the other?"

## DISCUSSION

Parents expressed high levels of enthusiasm for vaccines in general: all but one vaccinated their children against routine childhood diseases and 86% vaccinated their daughters against HPV. However, parents' views about requiring vaccination for school entry were more complex. Although 97% of parents supported current requirements regarding routine childhood vaccinations, opinions about requiring HPV vaccine were dramatically split between Caucasian parents, who generally opposed mandates, and minority parents, who largely supported them.

All Caucasian parents in our study vaccinated their own daughters, but most opposed mandates because they believed that HPV vaccination should be an individual decision for each family. Their explanations largely echoed Colgrove's argument that "because HPV is not casually transmissible... there is a less compelling rationale for requiring protection against it than against measles or pertussis" (Colgrove 2006). Unlike measles and pertussis, many Caucasian parents believed that the public health threat from a sexually transmitted infection was not high enough to justify the intrusion on parental autonomy from vaccine mandates, and they stated that HPV vaccine should be a personal decision for that reason. Some Caucasian parents also expressed concerns that mandating HPV vaccination might promote promiscuous sexual activity.

In contrast, minority parents' personal decisions regarding vaccinating their own daughters more closely matched their opinions on mandatory HPV vaccination. Personal vaccination rates and favorable views of mandates among African-American, Afro-Caribbean/African, and Latino parents were 90%/78%, 73%/60%, and 90%/90% respectively. When asked to explain their attitudes, most minority parents expressed a desire to protect their own daughters and other young women through mandatory vaccination, as expressed by one African-American mother, "I think they should be required to receive [HPV vaccination]. If it's going to help to prevent them from getting cervical cancer, why shouldn't they get it?" Concerns about parental autonomy and route of transmission were rarely mentioned as reasons to avoid school-entry requirements for HPV vaccination. Indeed, some Latino parents viewed HPV vaccination as more important than vaccination against routine childhood diseases because of the stigma associated with contracting a sexually transmitted infection. Minority parents' arguments that mandatory vaccination would benefit both their children and other young women, and the concordance between choosing to vaccinate their own daughters and supporting mandates, suggest that many minority participants feel that interventions that benefit the individual will also benefit the group. Their views appear to reflect a community orientation linking personal and shared welfare that has previously been described among African-Americans (Baldwin 1990; Carson 2009), Latino-Americans (Greenfield 1994), Latin American nationals (Pedrotti 2009), and immigrants from the Caribbean and Africa (Chioneso 1998) as compared with more individualistic values among Caucasians.

Our findings have several limitations. We studied a small, non-randomized sample of parents attending medical visits with their children, and our findings may not be generalizable to other groups or settings. The use of translation with Spanish-speaking participants may have introduced bias, though we tried to best capture both linguistic and cultural nuances by using bilingual and bicultural investigators for interviewing, translation,



and interpretation of data. The study was not designed to assess the independent contributions of factors such as race, country of origin, or the age of the daughter or parent on parental views toward mandatory vaccination. Such questions could be better answered by well-designed surveys.

Our findings suggest nuanced attributes of parental attitudes that could be more systematically measured in explaining public perceptions of vaccination policy. Our goals with this qualitative study were to examine in depth how a cohort of low-income and minority parents view school-entry requirements for HPV vaccine and to explore possible variation along broadly drawn lines of ethnicity. We found preliminary evidence of complex attitudes and substantial ethnic differences, which, if replicated in larger surveys, could be useful for informing public health initiatives around HPV vaccination.

## Conclusions

Although most parents accept HPV vaccination for their daughters, many would oppose school entry requirements. Parents from different racial and ethnic backgrounds expressed unique perspectives about mandatory HPV vaccination, and Caucasians were less likely than parents of other races/ethnicities to support vaccine mandates.

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**Table 1**

Parents demographic characteristics and relevant personal history (n=73)

Variable	Mean (range) or n (percent)
Ethnicity	
<i>Caucasian</i> <sup>1</sup>	19 (26%)
<i>African-American</i>	18 (25%)
<i>Afro-Caribbean or African</i> <sup>2</sup>	15 (21%)
<i>Latino</i> <sup>3</sup>	21 (29%)
Age	43 (31–60)
Years of education	13 (0–19)
Marital Status	
<i>Married</i>	34 (47%)
<i>Divorced/Widowed</i>	14 (19%)
<i>Single</i>	25 (34%)
Country of Origin	
<i>United States</i>	40 (55%)
<i>Other</i>	33 (45%)
Years in U.S. (for those born in other countries)	16 (4–33)
Primary Language	
<i>English</i>	50 (68%)
<i>Spanish</i>	18 (25%)
<i>Other</i>	5 (7%)
Expressed religious affiliation	60 (82%)
Religious service attendance (among those with affiliation)	
<i>At least weekly</i>	25 (42%)
<i>1–3 times per month</i>	19 (32%)
<i>Less than once per month</i>	16 (27%)
Relationship to adolescent girl <sup>4</sup>	
<i>Mother</i>	67 (92%)
Age of adolescent girl	15 (11–18)
Insurance status of adolescent girl	
<i>Private</i>	17 (23%)
<i>Public</i>	52 (71%)
<i>None</i>	4 (5%)
Previously declined a recommended vaccine	6 (8%)
Personal experience or known someone with abnormal Pap test	42 (58%)
Personal experience or known someone with genital warts	9 (12%)
Personal experience or known someone with cervical cancer	22 (30%)
Agree/strongly agree with the sentence: cervical cancer is a deadly disease	67 (92%)

<sup>1</sup> Caucasian parents: Countries of origin: U.S. n=17; Bosnia n=1 (10 years in U.S.), Canada n=1 (25 years in U.S.)

<sup>2</sup> Afro-Caribbean and African parents: Countries of origin: Antigua n=1, Bahamas n=1, Barbados n=2, Haiti n=4, Trinidad n=4; Cape Verde n=1, Nigeria n=1, Tanzania n=1; average years in U.S. 17.5 (range 4–27 years)

<sup>3</sup> Latino parents : Countries of origin: Colombia n=5; Dominican Republic n=6; El Salvador n=5; Puerto Rico n=3; U.S. n=2; average years in U.S. 15.3 (range 4–33); Interview conducted in Spanish n=17

<sup>4</sup> Other relationships included 3 fathers, 2 aunts and 1 sister.

**Table 2**

## Views on mandatory HPV vaccination

	<b>Caucasian (n=19) 2 favored mandates 19 vaccinated their daughters</b>	<b>African-American (n=18) 14 favored mandates 16 vaccinated their daughters</b>	<b>Afro-Caribbean and African (n=15) 9 favored mandates 11 vaccinated their daughters</b>	<b>Latino (n=21) 19 favored mandates 19 vaccinated their daughters</b>
<b>Favoring mandates</b>	Prevent cervical cancer (2)* Peace of mind (1)	Prevent cervical cancer (7) Protect sexually active adolescents from HPV (7)	Prevent cervical cancer (4) Protect sexually active adolescents from HPV (6) Public health intervention (3)	Prevent cervical cancer (9) Peace of mind (2) Protect sexually active adolescents from HPV (9) Public health intervention/positive government intervention (4) Medical innovation (1) Avoid stigma associated with sexually transmitted infections (3)
<b>Opposing mandates</b>	Personal choice (9) Not transmissible by routine social contact (6) New vaccine with potential unknown side-effects (3) Promotion of sexual activity (3)	Personal choice (2) Not transmissible by routine social contact (1) Against all vaccines (1)	Personal choice (3) New vaccine with potential unknown side-effects (3) Lack of information (3)	Personal choice (2) Not transmissible by routine social contact (1)

\* Numbers represent the number of times the argument was used, and may reflect multiple reasons used by the same participant.