

# Sources of HPV vaccine hesitancy in parents

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Despite strong national recommendations to vaccinate adolescents against the human papillomavirus (HPV), only 14% of teenage girls completed all 3 doses in 2010. Parental hesitancy may be one of the strongest reasons behind this low uptake rate. This review investigates sources of parental hesitancy including parental concerns associated with vaccinations in general, parental knowledge as a basis of HPV vaccine hesitancy, social qualms parents may have with regards to the HPV vaccine, and parental attitudes toward allowing their sons to be vaccinated against HPV. By better understanding these sources of hesitancy, we can focus research efforts towards addressing them in an attempt to improve HPV vaccine uptake.

## Introduction

It is well known that the human papillomavirus (HPV) is responsible for most cervical and anogenital cancers.<sup>1</sup> In 2006, a quadrivalent vaccine was approved by the FDA as a primary preventive strategy to reduce HPV infections and, in return, HPV-related diseases and cancers. Since its introduction, the percent of those eligible who have received the vaccine has varied by country. Vaccine coverage in Europe has been high overall, with a three-dose uptake rate of 76% in England by 2010 and a three-dose uptake rate of 81% in Scotland by 2011.<sup>2</sup> This is predominantly due to school-based programs. France, which lacks such a program, only had a 28.5% three-dose completion rate by 2009.<sup>3</sup> Uptake rates also vary in other parts of the world: in Australia, which implemented a school-based program in 2007, the completion rate was 72%, while in developing countries, which have adopted pilot centers to assess vaccination feasibility, completion rates have ranged from 70% to 90%. In Rwanda, which adopted a school-based program with contributions from Merck, the completion was over 93%.<sup>2,4,5</sup>

In comparison, the uptake rate in the United States has been much worse. A retrospective review of the 2010 National Health Interview Survey showed that only 14% of 11–17 y old girls in the United States completed all three doses, with numbers far worse for adolescent males.<sup>6,7</sup> Despite sound scientific data supporting the efficacy of the vaccine, why aren't more parents lining up to get their children vaccinated? The poor uptake rate of this vaccine may be attributed to a variety of factors, among which is parental hesitancy.<sup>8–14</sup> The purpose of this review is to

investigate sources of parental hesitancy in an attempt to better address them. Specifically, we will focus on parental concerns associated with vaccinations in general, parental knowledge as a basis of HPV vaccine hesitancy, social qualms parents may have with regards to this specific vaccine, and finally parental attitudes toward allowing their sons to be vaccinated against HPV.

## Parental Concerns Associated with Vaccinations in General

Vaccine hesitancy has been a longstanding attitude that has consequences for not only the individual who refuses vaccination, but also the rest of society. The theory behind vaccination relies heavily on the premise of herd immunity, ultimately leading to eradication of the disease. Therefore, individual hesitance against vaccination is an important problem the medical community has been trying to grapple with for some time.<sup>15</sup>

Since their introduction, vaccinations have been a subject of many controversies. In the 1990s, widespread concern that the hepatitis B vaccine could cause multiple sclerosis resulted in a suspension of the universal vaccination program in France.<sup>16</sup> The most recent vaccine scare revolved around a now debunked study from the United Kingdom in 1998, which suggested an association between the MMR vaccine and autism.<sup>17</sup> These specific controversies seem to accumulate in the minds of the public, resulting in decreased confidence in and fear of vaccinations in general. For example, studies suggest that parents still report concerns that vaccines can cause autism despite a plethora of studies that have disproved this theory.<sup>18</sup>

Given the fact that many of the vaccine-preventable diseases are no longer as prevalent as they once were, parents are often not aware of the devastating effects these diseases can have on their children's health. As a result their naïveté, they are more frightened of the risks of the vaccines than the diseases they prevent.<sup>19</sup> According to this theory, parents who understand the severity of the HPV vaccine-preventable diseases would be more willing to have their children vaccinated. In fact, this was demonstrated by a study investigating parental factors associated with HPV vaccine receipt.<sup>20</sup> In this study, Rosenthal et al. showed that less education and a parental history of sexually transmitted infection were associated with HPV vaccine acceptance. This suggests that despite less education, parents who have had sexually transmitted diseases are strongly influenced by those experiences in deciding to vaccinate their children against HPV. Another survey of 278 parents on their attitudes toward HPV vaccination showed that perception of HPV infection severity correlated with HPV vaccine acceptability.<sup>21</sup> This study suggests that public vaccination

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policies should focus less on dry statements of probabilities and more on the severity and anecdotes regarding the vaccine-preventable diseases, when educating the public. This theory has already been placed into practice by Texas Children's Hospital, which offers their patients a booklet compiling personal stories of families affected by vaccine-preventable diseases.<sup>22</sup>

Public policies that mandate vaccination may also inadvertently create suspicion in the minds of parents. Studies suggest that in the United States, there is an increasing trend of parental opposition toward mandatory vaccination as reflected by an increase in school vaccine exemption rates.<sup>19</sup> In an analysis of the 2002 HealthStyles survey, Kennedy and colleagues reported that 12% of parents surveyed disapproved of compulsory vaccination.<sup>23</sup>

To overcome this suspicion, efforts have been focused on developing strategies to improve vaccination acceptance rates among parents. One of these methods is to increase transparency in policy-making decisions related to vaccinations. Studies suggest that for most parents, safety and trust issues play the greatest role in decision-making regarding vaccination for their children.<sup>24-27</sup> Perhaps by increasing awareness of the extensive procedures involved in the surveillance of vaccine safety, the medical community can achieve increased parental confidence in allowing vaccination of their children. Unfortunately, the intricacies of these systems are also not well-understood by health care providers.<sup>28</sup> Health care providers should, therefore, become more familiar with the details regarding these surveillance procedures and refer their patients to national resources such as the Centers for Disease Control (CDC).

### Knowledge as a Basis of Vaccine Hesitancy

The literature on general vaccination knowledge in relation to parental hesitancy highlights a surprising pattern: parents who refuse vaccination tend to be more educated whereas those who accept vaccination have a lower educational level. With regards to vaccinations in general, the literature supports that parents who accept vaccinations for their children often have limited knowledge of the vaccine-preventable diseases and vaccinations. These studies further indicate that the decisions of these parents are often based on provider recommendations rather than specific knowledge about the vaccine or vaccine-preventable disease.<sup>29-33</sup> Furthermore, research has shown that parents who do not have their children vaccinated have researched the topic extensively and overall show an interest in health-related issues.<sup>34,35</sup> This observation is also supported in the realm of HPV vaccination. Multiple studies have shown that parents with lower levels of education are more likely to accept this controversial vaccine for their children.<sup>21,36-40</sup> One theory behind this observation is that educated parents are often more likely to have access to specific sources of media, such as the Internet, which may expose them to contradictory and possibly inaccurate information regarding the HPV vaccine.<sup>41-43</sup> In addition, highly educated parents may feel more confident in their ability to interpret complex scientific and clinical health information, allowing them to ignore the advice of practitioners if contradictions exist.

Knowledge on the part of healthcare providers is also critical to vaccine uptake. Multiple studies have shown that the knowledge and attitudes of healthcare providers toward vaccination are reflected in parental attitudes toward vaccinations.<sup>44-54</sup> With regards to HPV, some general practitioners who have not seen or treated the effects of HPV related genital warts, cervical dysplasia, or anogenital cancer, may not feel as strongly about the vaccinations as other providers.<sup>55-57</sup> These providers should be aware of not only the details of the vaccination, but also the ramifications of alternative management if children are not vaccinated, such as the possible risk of preterm labor after cervical excision procedures.<sup>58</sup> This type of knowledge may empower providers in their discussions regarding HPV vaccination with parents. It is important to remember, however, that the healthcare providers should be aware of and include the minimal risks associated with the HPV vaccination in their discussion with parents. The most commonly reported non-serious adverse events include syncope, dizziness, nausea, headache, fever, urticarial, and injection site pain, redness, or swelling.<sup>59</sup> Ultimately, it is up to the parents to make an informed decision, and it is the responsibility of the healthcare provider to give the information necessary for such a decision.

### Social Qualms Regarding the HPV Vaccine

Prior to FDA approval of the HPV vaccine, much controversy was anticipated regarding vaccination against a sexually transmitted disease. As a result, multiple studies were performed investigating parental attitudes toward such a vaccine.<sup>37,60-65</sup> Studies in the United States and United Kingdom showed that parents were generally accepting of the HPV vaccination in their children.<sup>60,63,64</sup> For example, a survey of 278 parents regarding their attitudes toward HPV vaccination found that the sexual transmissibility of HPV was not a significant issue in HPV vaccine acceptability.<sup>21</sup> In another survey of 153 women, Rosenthal et al. found that a mother's decision to allow HPV vaccination did not depend on her sexual values, but rather on her attitude toward vaccination in general.<sup>20</sup> Similar results were found among parents in Cuernavaca, Mexico. In this survey of 800 mothers residing, 84% of the parents would allow their daughters to participate in an HPV vaccine trial evaluating its effectiveness in preventing cervical cancer.<sup>61</sup> Among other factors, a history of two or more sexual partners correlated with an increased acceptance by mothers to have their daughters vaccinated. These results suggest that parents are more concerned with potential morbidity and mortality of HPV associated diseases, rather than the sexually transmitted nature of the HPV infection.<sup>60,64,65</sup>

Surprisingly, parents from conservative cultures also did not exhibit the anticipated social aversion to a vaccine against a sexually transmitted disease. A report on focused group discussions in Mysore, India (a city where 76% of the population is Hindu, 19% is Muslim, and 4% is Christian, Jain, Buddhist, or other religions) observed that many parents were accepting of the HPV vaccine, especially since it would prevent cervical cancer.<sup>66</sup> Although most of these parents felt strongly that young girls were unlikely to become sexually active before marriage, several did

recognize that young people may engage in premarital sex, leading most to conclude that adolescent girls should be vaccinated between 15 and 18 y of age. Another investigation from Turkey on 525 women between 19 and 53 y of age found that despite conservative views, more than half (56%) were willing to be vaccinated. For most women (67%), the major factor that led them to this decision was a recommendation from health care workers.<sup>67</sup>

The current literature does suggest a propensity of parents to vaccinate older vs. younger adolescents. One of the main reasons cited by parents for not vaccinating their 11-y-old daughters through a school-based HPV vaccination program in Canada was “a desire to wait until their daughter was older.”<sup>40</sup> In the US, the 2010 National Health Interview Survey found that adolescent girls 13–17 y olds had a higher uptake of 3 doses of HPV vaccine than 11–12 y old girls.<sup>6</sup> This has been supported by other studies reviewing responses to the 2010 National Immunization Survey-Teen data.<sup>68</sup> Moreover, the 2010 uptake rates for girls 11–12 y old remained close to the 2008 uptake rate (14.5% vs 14.7%). This is concerning, given that the 2006–2010 National Survey of Family Planning showed that 32% of adolescents have already had sexual intercourse by the age of 16.<sup>69</sup> Furthermore, medical providers are more likely to recommend HPV vaccination in late adolescence vs. early adolescence.<sup>57</sup> Given that the series must be completed prior to sexual debut for maximum efficacy, parents need to know the importance of starting the vaccination series at least six months before anticipated sexual activity in their daughters. As it is impossible to predict this time frame, parents need to be more educated about the importance of vaccination in early adolescence.

### What about the Boys?

In 2009, the FDA expanded the indications for the quadrivalent HPV vaccine to include boys 9 to 26 y old.<sup>70</sup> Vaccination of boys has several benefits including (1) preventing genital warts in vaccinated males and, thus, in their partners, (2) preventing HPV-related anogenital and oral cancers in males, (3) preventing anal cancers in males who engage in sexual intercourse with other males, and (4) preventing transmission of HPV to female sexual partners, which would decrease the incidence of HPV-associated anogenital cancers in females.<sup>71</sup>

It seems that despite these benefits, initiation, and completion rates for males have been very low. In 2010, data from the National Health Interview Survey (NHIS) demonstrated that only 2% of 9–17 y old males had initiated and only 0.5% had completed the HPV vaccine series.<sup>7</sup> Few studies have looked at why parents choose to vaccinate their sons against HPV. When parents in Denmark were asked about their reasons, 76% answered “to protect my son against cancer,” 36% said “to protect my son against genital warts,” and only 13% indicated that “the reduction of sexually transmitted infections is a shared responsibility.”<sup>72</sup> A similar

survey from the US found that 77–94% of parents would vaccinate their sons to protect them from genital warts, 89–100% would vaccinate their sons to protect them from anogenital cancer, and only 12–18% would vaccinate them to protect women from getting cervical cancer.<sup>73</sup> Gender differences have also been reported in intent to vaccinate daughters (71%) vs. sons (44%).<sup>74</sup> One of the major barriers to vaccinating their sons was the belief that boys are not at risk. This idea has been corroborated by other studies.<sup>75</sup> It appears that physicians are also not as aware of the benefits of the HPV vaccination in males as they are of the benefits in females.<sup>76</sup>

Another important reason to vaccinate males is to protect those who engage in sexual intercourse with other males from developing anal cancer. The main challenge here is the reluctance of adolescents to disclose their sexual orientation to parents or healthcare professionals and the reluctance of parents to accept this possibility.<sup>71</sup> It seems that in an effort to focus on acceptability of HPV vaccination in adolescent girls, we have fallen short in addressing acceptability of HPV vaccination in boys. Clearly, more research needs to be devoted and more attention needs to be drawn to educating the public about HPV vaccination of adolescent males.

### Conclusions

The potential benefits of the HPV vaccine are immense. With widespread implementation of the vaccine, we may be approaching an era where experiences recounting the devastation from HPV-related anogenital cancer are stories of the past, as are anecdotes regarding the devastating effects of polio half a century ago. To achieve this future, we need to focus our efforts on improving current uptake. It appears that the initially anticipated hesitation against adolescent vaccination for a sexually transmitted disease is not a predominant concern for parents when deciding whether their children should be vaccinated. Furthermore, it seems that parents from different cultures are open to their children receiving vaccination against HPV, despite its association with sexual transmissibility. Nevertheless, many parents continue to exhibit hesitancy against having their children vaccinated against HPV. Given the fact that parents who themselves have had sexually transmitted diseases are more likely to have their children vaccinated, perhaps educational efforts need to include anecdotes so that parents who have not had firsthand experiences can understand on a more personal level the extent of problems HPV infection can cause. In addition, efforts need to be focused on educating providers who may not treat patients with cervical dysplasia or other HPV-related diseases about the severity and risks associated with the management.

#### Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.



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