



## Short communication

## Parental motivations for seeking second medical opinions for their child's HPV vaccine

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## ABSTRACT

We sought to characterize parents who look for second medical opinions to get human papillomavirus (HPV) vaccine for their children and whether second opinions influenced acceptance of HPV vaccine. Between July and August 2019, we conducted an online survey with a national sample of 906 parents of adolescents ages 11–17. We used multivariable logistic regression to assess correlates of looking for second opinions on HPV vaccination. For those who looked for second opinions, the survey assessed their HPV vaccine information needs and whether their child ultimately received the vaccine. Overall, 15% of parents reported looking for second opinions. Parents were more likely to look for second opinions if their self-reported knowledge about HPV vaccine was the same (Odds ratio [OR] = 1.94; 95% confidence interval [CI]:1.13, 3.30) or more (OR = 3.97; 95% CI:2.35, 6.73) than their child's provider, or if they reported seeing HPV vaccine information on social media (OR = 2.50; 95% CI:1.69, 3.69). Parents were also more likely to look for second opinions if they were male, reported low vaccine confidence, disagreed with social norms favoring HPV vaccination, or had a young child (all  $p < .05$ ). Among parents who looked for second opinions, 32% wanted the most information about safety and side effects, and 40% decided not to get their child vaccinated or were still undecided. In conclusion, a considerable number of parents look for second opinions to obtain information about HPV vaccine yet many still decline vaccination. Evidence-based messaging addressing parents' HPV vaccine information needs may avoid delayed vaccine initiation in search of second opinions.

## 1. Introduction

The human papillomavirus (HPV) vaccine provides safe and effective protection against persistent HPV infections that cause six types of cancers and genital warts (Senkomago et al., 2019). Despite U.S. guidelines recommending routine HPV vaccination (Meites et al., 2016) only 54% of 13- to 17-year old boys and girls were up-to-date with HPV vaccine in 2019 (Elam-Evans et al., 2020). Parental declination is a significant barrier to timely HPV vaccination (Gilkey et al., 2017), and many parents report the need for more information (i.e., lack of knowledge, lack of necessity, safety concerns) as a major reason for not getting their adolescents vaccinated (Beavis et al., 2018). A recent national study reported that 45% of parents who first declined HPV vaccination eventually accepted it at a later health care visit (secondary

acceptance) (Kornides et al., 2018). Parents commonly reported learning more about the HPV vaccine as a reason for secondary acceptance (Kornides et al., 2018).

In the general context of health care, one way parents get additional information after receiving initial medical advice is by seeking a “second medical opinion” (Pham et al., 2019). Patients and caregivers often look for second opinions to confirm diagnoses, disease management or treatment options for a variety of health conditions, mostly involving complex diseases or risky medical procedures (Shmueli et al., 2017). Studies show that although patients prefer health information from their providers, many felt they could not make an informed decision from the short time spent with the provider and ultimately looked for second medical opinions elsewhere (Cernat et al., 2019). Little is known about how often parents look for second opinions regarding HPV vaccination

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for their children, and whether second opinions influence subsequent acceptance of HPV vaccine. Using data from a national sample of parents of adolescents, our study aimed to assess the prevalence and correlates of looking for second opinions for HPV vaccine, parents' information needs for doing so, and the potential impact of second opinions on HPV vaccine secondary acceptance. A better understanding of the factors associated with parents looking for second medical opinions about HPV vaccination can inform vaccine communication interventions to reduce delayed vaccination and then, improve on-time vaccine uptake.

## 2. Methods

### 2.1. Participants and procedures

Participants were members of an existing market research panel of U.S. adults maintained by Qualtrics, a commercial software and survey research company. The panel was constructed from suppliers with a diverse set of recruitment methodologies, so the overall sampling frame is not overly reliant or dependent on any particular demographic group (Miller et al., 2020). Survey invitations were emailed to a random sample of 11,000 panel members, and 6,470 responded by visiting the survey and taking the eligibility screener. Eligible participants were parents of at least one 11- to 17-year-old child living primarily in their households. A total of 1,109 parents were eligible, provided informed consent, and completed the survey between July and August 2019. We used the American Association for Public Opinion Research Response Rate 5 (AAPOR, 2015) to calculate the survey response rate. After accounting for ineligible panel members ( $n = 5,270$ ) and those who did not complete at least two-thirds of the survey ( $n = 91$ ), our online survey achieved a response rate of 58%. The survey was programmed to stop recruiting when it reached 1,200 enrolled participants (both complete and partial surveys). The survey instructed participants with more than one eligible child to respond with regard to the child with the most recent birthday. For this analysis, we excluded 203 parents who reported never having talked about HPV vaccine with anyone from their child's health care team, to produce our final sample of 906 parents. The Penn State College of Medicine Institutional Review Board approved the study protocol. The full survey is available online (<https://sites.psu.edu/impstilab/resources/>).

### 2.2. Measures

The survey asked respondents whether they "have ever looked for a second medical opinion to decide about getting the HPV vaccine" for their child (yes/no). Parents who reported looking for a second opinion were then asked to answer the statement: "Looking for a second medical opinion made me..." with response options indicating they got HPV vaccine for their child, did not get HPV vaccine, or were still undecided. The survey also assessed seven common information topics about HPV vaccination that parents report wanting to learn more about (Shah et al., 2019), including diseases prevented by the vaccine, national recommendations for vaccination, age to start the vaccine series, vaccination for boys, vaccination for children who are not sexually active, school-entry requirements, and safety or side effects of the vaccine.

The survey assessed vaccine confidence with the following validated items (Gilkey et al., 2014): "Vaccines are necessary to protect the health of [child's name]," "Vaccines do a good job in preventing the diseases they are intended to prevent," "Vaccines are safe," "If I do not vaccinate [child's name], [child's name] may get a disease such as meningitis and cause others to get the disease." All items used a 5-point agreement scale that ranged from "strongly disagree" to "strongly agree." We created a vaccine confidence score by calculating their mean response values and creating two categories: low (<4) and high (4–5). The survey also assessed whether parents have ever seen information (e.g., stories, reports, videos, news) about HPV vaccine on social media even when they were not looking for it (yes/no) (Margolis et al., 2019).

Self-reported knowledge regarding HPV vaccine was assessed with one item (Motta et al., 2018): "How much more information about the HPV vaccine would you say you know compared to [child's name]'s doctor or health care provider?" Responses were categorized as knowing more ("a lot more" or "slightly more"), about the same ("about the same"), or less ("a lot less" or "slightly less"). The survey assessed injunctive normative perceptions (social norms) that HPV vaccination is an accepted behavior among interpersonal networks with one item: "Most people who are important to me would support [child's name] getting HPV vaccine." We dichotomized responses as agreeing ("strongly" or "somewhat agree") or disagreeing/neither ("strongly disagree," "somewhat disagree," or "neither disagree or agree"). Socio-demographic variables included parents' sex, race/ethnicity, educational attainment, annual household income, and state of residence (categorized in four U.S. regions). The survey also assessed the sex, age, and HPV vaccination status (dichotomized as " $\geq 1$  doses" or "0 doses") of the index child. The survey also assessed who was the primary household member making health care decisions for the child with one question: "In your household, who is the main person who makes decisions about [NAME]'s health care?" Response options were "me," "my spouse or partner," "the child," or "someone else."

### 2.3. Statistical analysis

We used bivariate logistic regression to identify variables associated with looking for second opinions for HPV vaccination. We then entered statistically significant covariates into a multivariable logistic regression model. Statistical tests were two-tailed with a critical  $\alpha$  of 0.05. We calculated odds ratios (OR) and 95% confidence intervals (CI). We also presented descriptive statistics to characterize parents who sought second opinions by their reported HPV vaccine information needs. We conducted analyses using Stata Version 14 (College Station, TX).

## 3. Results

### 3.1. Participant characteristics

Parents were evenly split between having reported on a daughter (52%) or a son (48%), and the average child age was 14 years (standard deviation, 1.9 years) (Table 1). Seventy-two percent of children had received at least 1 dose of HPV vaccine. The majority of parents were female (75%) and non-Hispanic white (70%). More than one-fifth (22%) of parents had a high school degree or less education, and almost one-third (30%) reported an annual household income of less than \$40,000. Parents reported from all regions of the US. Eighty-five percent of participants said they were the main person who makes decisions about the child's health care.

### 3.2. Correlates

Fifteen percent of parents reported looking for a second medical opinion for HPV vaccination. In multivariable analysis, parents more often sought second opinions if they were male (OR = 2.01; 95% CI:1.32, 3.05), reported low vaccine confidence (OR = 1.74; 95% CI:1.14, 2.66), disagreed with social norms favoring HPV vaccination (OR = 1.61; 95% CI: 1.03, 2.51) (Table 2), or had a young child (11–14 years old vs. 15–17 years old: OR = 1.72; 95% CI:1.14, 2.60). Likewise, parents were more likely to look for second opinions if they believe they know about the same (OR = 1.94; 95% CI:1.13, 3.30) or more about HPV vaccination than their child's health care provider (OR = 3.97; 95% CI:2.35, 6.73) versus those who reported knowing less. Similarly, parents who reported seeing information about HPV vaccine on social media were more likely to look for second opinions (OR = 2.50; 95% CI:1.69, 3.69).

**Table 1**  
Sample characteristics (n = 906).

	N	(%)
<i>Child characteristics</i>		
Female	475	(52)
<i>Age, years</i>		
11–14	533	(59)
15–17	373	(41)
<i>HPV vaccine doses received</i>		
0 doses	247	(27)
≥1 doses	659	(72)
<i>Parent and household characteristics</i>		
Female	683	(75)
<i>Race/Ethnicity</i>		
Non-Hispanic White	635	(70)
Non-Hispanic Black	112	(12)
Hispanic	110	(12)
Other	49	(5)
<i>Education</i>		
High school degree or less	202	(22)
Some college	372	(41)
College degree or higher	332	(37)
<i>Annual household income</i>		
<\$40,000	268	(30)
\$40,000 - \$79,999	289	(32)
≥\$80,000	320	(35)
Not reported	29	(3)
<i>Region</i>		
Northeast	137	(15)
Midwest	174	(19)
South	272	(30)
West	323	(36)

3.3. Information needs and secondary acceptance

Among parents who sought second medical opinions (n = 140), around half reported wanting more information about three topics: safety and side effects (55%), diseases prevented by HPV vaccine (50%), and the age at which to start vaccination (49%) (Appendix). When asked which topic they most wanted information about, parents also prioritized safety and side effects (32%) and diseases prevented by HPV vaccine (21%). Sixty percent of parents said the second opinion lead to secondary acceptance of HPV vaccine but 16% decided against getting the vaccine and 24% were still undecided.

4. Discussion

Our study is among the first to assess factors associated with parents looking for second medical opinions about HPV vaccination and whether this practice lead to secondary acceptance of the vaccine. Overall, 15% of the study sample reported looking for second medical opinions. This finding aligns with results from a recent systematic review reporting that parents often preferred not to make an immediate decision about HPV vaccination during discussions with a provider, but rather wished to decide later after gathering more information (Gilkey & McRee, 2016). We also found that parents who looked for second opinions wanted to learn more about safety and side effects, and diseases prevented by HPV vaccine. Prior studies show that these two topics represent priority informational needs for parents deciding on getting HPV vaccine for their children (Beavis et al., 2018; Shah et al., 2019). Our findings underscore the importance of having providers using evidence-based communication interventions, like the Announcement Approach, to avoid delayed HPV vaccine initiation in search of second opinions. More concretely, the *Connect* and *Counsel* steps of the Announcement Approach intervention help providers assess patients' and parents' main reason causing HPV vaccine hesitancy and address those concerns with concise messaging, respectively (Shah et al., 2021). In addition, a recent study showed that motivational interviewing is a promising intervention strategy providers can use to engage with vaccine-hesitant parents when longer conversations are needed (Reno

**Table 2**  
Correlates of looking for second medical opinions about HPV vaccination (n = 906).

	# of parents who looked for second opinions/ Total in category (%)	Bivariate OR (95% CI)	Multivariable OR (95% CI)
Overall	140/906 (15)	NA	NA
<i>Child characteristics</i>			
<i>Sex</i>			
Female	72/475 (15)	Ref	–
Male	68/431 (16)	1.05 (0.73, 1.50)	–
<i>Age, years</i>			
15–17	43/373 (12)	Ref	Ref
11–14	97/533 (18)	1.71 (1.16, 2.51)**	1.72 (1.14, 2.60)*
<i>HPV vaccine doses received</i>			
0 doses	44/247 (18)	Ref	–
≥1 doses	96/659 (15)	0.79 (0.53, 1.16)	–
<i>Parent and household characteristics</i>			
<i>Sex</i>			
Female	87/683 (13)	Ref	Ref
Male	53/223 (24)	2.14 (1.46, 3.13)**	2.01 (1.32, 3.05)**
<i>Race/Ethnicity</i>			
Non-Hispanic White	83/635 (13)	Ref	Ref
Non-Hispanic Black	27/112 (24)	2.11 (1.29, 3.45)**	1.52 (0.89, 2.60)
Hispanic	23/110 (21)	1.76 (1.05, 2.94)*	1.73 (0.99, 3.03)
Other	7/49 (14)	1.11 (0.48, 2.55)	1.12 (0.46, 2.75)
<i>Education</i>			
High school degree or less	34/202 (17)	Ref	–
Some college	41/372 (11)	0.61 (0.37, 1.00)	–
College degree or higher	65/332 (20)	1.20 (0.76, 1.90)	–
<i>Annual household income</i>			
<\$40,000	41/268 (15)	Ref	–
\$40,000–\$79,999	45/289 (16)	1.02 (0.64, 1.62)	–
≥\$80,000	50/320 (16)	1.03 (0.65, 1.61)	–
Not reported	4/29 (14)	0.89 (0.29, 2.68)	–
<i>Region</i>			
Northeast	20/137 (15)	Ref	–
Midwest	27/174 (16)	1.07 (0.57, 2.01)	–
South	33/272 (12)	0.81 (0.44, 1.47)	–
West	60/323 (19)	1.33 (0.77, 2.32)	–
<i>Vaccine attitudes</i>			
<i>Self-reported HPV knowledge</i>			
Know less than health care provider	24/337 (7)	Ref	Ref
Know the same as health care provider	49/337 (15)	2.22 (1.33, 3.71)**	1.94 (1.13, 3.30)*
Know more than health care provider	67/232 (29)	5.30 (3.20, 8.76)**	3.97 (2.35, 6.73)**
<i>Exposure to social media information</i>			
No	58/565 (10)	Ref	Ref
Yes	82/341 (24)	2.77 (1.92, 3.99)**	2.50 (1.69, 3.69)**

(continued on next page)

Table 2 (continued)

	# of parents who looked for second opinions/ Total in category (%)	Bivariate OR (95% CI)	Multivariable OR (95% CI)
Vaccine confidence score			
High	56/507 (11)	Ref	Ref
Low	84/399 (21)	2.15 (1.49, 3.10)**	1.74 (1.14, 2.66)*
Social norms favoring HPV vaccination			
Agree	90/678 (13)	Ref	Ref
Disagree/neither	50/228 (22)	1.84 (1.25, 2.69)**	1.61 (1.03, 2.51)*

Note. HPV = Human papillomavirus; OR = Odds ratio; CI = confidence interval; Ref = Referent group; NA = Not applicable. Dashes (–) indicate the variable was not included in the multivariable model because it was not statistically significant in bivariate analysis. \*  $p < .05$ ; \*\*  $p < .01$ .

et al., 2018).

It was concerning to find that 40% of parents who looked for second opinions decided not to get the vaccine or remained undecided. Provider follow-up counseling with HPV vaccine-declining parents has been shown to significantly increase secondary acceptance of the vaccine (Kornides et al., 2018; Shay et al., 2018). However, data show that only half of U.S. parents had received follow-up counseling after initial HPV vaccine refusal (Kornides et al., 2018), highlighting substantial missed opportunities for providers to deliver additional messaging about the importance of vaccination, especially as a proven strategy to prevent several cancers. Follow-up counseling might also be important to address conflicting messaging about HPV vaccination made by healthcare teams. A national study reports that 52% of parents discuss HPV vaccination with more than one member of their adolescent's healthcare team (Fontenot et al., 2018). Of parents who had multiple discussions, almost one-quarter (24%) of them reported getting only recommendations against HPV vaccination or a mix of recommendations both in favor and against it (Fontenot et al., 2018). This is especially troubling because incongruent messages that contradicts vaccination best practices may lead parents to continue declining HPV vaccine (Gilkey et al., 2017; Gilkey & McRee 2016). This also highlights the need of vaccine communication training that reaches the entire healthcare team (e.g., providers, nurses, other clinic staff) and clinic-level interventions to deliver follow-up counseling to vaccine-declining parents (e.g., recall notices with information that is responsive to the main reason expressed for vaccine declination).

We also found that parents who believed they knew more about or the same about HPV vaccine than their child's provider and those exposed to HPV vaccine information on social media were more likely to look for second opinions. In another study, a majority of respondents also considered online information to be the "same as" or "better than" a physician's information (Diaz et al., 2002). Motta and colleagues argue that this type of overconfidence can be thought about as a Dunning-Kruger effect, in which individuals who lack expertise cannot correctly appraise their own knowledge vis-a-vis experts on the topic (Motta et al., 2018). Their work suggests that this type of knowledge overconfidence is high among adults with high levels of misinformation endorsement (Motta et al., 2018). With regard to social media exposure, a recent study found that parents who viewed online information that contradicted a pediatrician's diagnosis were less likely to trust the diagnosis ( $p < .001$ ) and more likely to seek a second opinion ( $p < .001$ ) than the control (Sood et al., 2019). Given the Internet's growing use as a source of medical information among U.S. adults (Finney Rutten et al., 2019), it is important that providers direct parents to trusted and appropriate (e.g., health literacy level of parents) informational resources or websites

when declination does occur.

#### 4.1. Strengths and limitations

Study strengths include using a large, national sample of parents and having a good response rate. The study had several limitations. The survey did not provide a definition of second medical opinions, and it is possible that parents have varying interpretations of this term, including speaking to the same provider again at a later visit, speaking to another provider, or seeking advice on medical online platforms. Additionally, the survey did not ask parents about the source of the second medical opinion, including whether it was a member of the adolescent's healthcare team or a provider outside that team, and the role of that provider (e.g., physician, nurse practitioner, physician assistant, medical assistant). The survey also did not assess what information or recommendation style (for, against, or both) parents derived from the second opinion. Future studies should also assess whether or not these additional vaccine discussions meet the parent's information needs. Additional research is needed to explore how interventions can most effectively follow-up with parents who initially decline HPV vaccine to address their information needs and increase secondary acceptance. Future studies are also needed to assess whether seeking a second opinion impacts the time lapse between the first opportunity to vaccinate and secondary acceptance.

#### 4.2. Conclusion

Our study findings provide valuable insight into the practice of many parents who look for second opinions for their child's HPV vaccine. With the increasing prevalence of vaccine hesitancy in the US (Szilagyi et al., 2020), primary care providers and clinic staff could strengthen their HPV vaccine communication skills to avoid parents declining vaccination in search for second opinions or provide follow-up communication to those who initially decline. Our findings also suggest the urgent need for improving parental trust in provider vaccine recommendations and educating parents about the potential dangers of making healthcare decisions based on information they see online.

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#### CRedit authorship contribution statement

**Ashley Wong:** Conceptualization, Investigation, Writing – original draft. **Jennifer L. Kraschnewski:** Writing – review & editing. **Katherine E. Spanos:** Methodology, Writing – review & editing. **Benjamin Fogel:** Writing – review & editing. **William A. Calo:** Funding acquisition, Conceptualization, Investigation, Methodology, Formal analysis, Writing – review & editing.

#### Declaration of Competing Interest

JK is principal investigator of a Penn State University College of Medicine research grant awarded by Merck. BF is principal investigator of a Penn State University College of Medicine research grant awarded by Pfizer that is independently administered by the American Academy of Pediatrics. The other authors have no financial disclosures or potential conflicts of interest to report.

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