

# Parents Who Decline HPV Vaccination: Who Later Accepts and Why?



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## ABSTRACT

**OBJECTIVE:** Parental declination contributes to low human papillomavirus (HPV) vaccination coverage among US adolescents, resulting in missed opportunities for cancer prevention. We sought to characterize parents' acceptance of HPV vaccination after declination ("secondary acceptance").

**METHODS:** In September 2016, we conducted an online survey with a national sample of parents of children ages 11 to 17 years. For those who reported having ever declined HPV vaccination for their children ( $n = 494$ ), our survey assessed whether they accepted the vaccine at a subsequent visit. We used multivariable logistic regression to assess correlates of secondary acceptance.

**RESULTS:** Overall, 45% of parents reported secondary acceptance of HPV vaccination, and an additional 24% intended to vaccinate in the next 12 months. In multivariable analyses, secondary acceptance was associated with receiving follow-up counseling about HPV vaccination from a health care provider (odds ratio, 2.16; 95% confidence interval, 1.42–3.28). However, only 53% of parents overall reported receiving such counseling. Secondary acceptance

was also associated with receiving a higher quality HPV vaccine recommendation from a provider during the initial discussion and greater satisfaction with provider communication, as well as higher vaccination confidence. Among the reasons for secondary acceptance, parents most commonly reported the child getting older (45%), learning more about HPV vaccine (34%), and receiving a provider recommendation (33%).

**CONCLUSIONS:** Our findings suggest secondary acceptance of HPV vaccination is common, with more than two-thirds of parents in this national sample accepting or intending to accept HPV vaccination after declination. Providers should seek to motivate secondary acceptance by delivering repeated, high-quality recommendations for HPV vaccination.

**KEYWORDS:** adolescent health; human papillomavirus infections/prevention and control; human papillomavirus vaccine; vaccine hesitancy; vaccine refusal

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## WHAT'S NEW

Although many parents initially decline human papillomavirus vaccination for their children, in this national study we found that more than two-thirds later accept, or intend to accept, the vaccine. Repeated, high-quality provider recommendations may increase the likelihood of secondary acceptance.

HUMAN PAPILLOMAVIRUS (HPV) vaccination coverage in the United States remains far below the Healthy People 2020 goal of 80%,<sup>1,2</sup> and parental declination is a key contributor to low uptake.<sup>3–5</sup> In a recent national survey, more than one-third of parents (36%) reported ever having refused or intentionally delayed HPV vaccination for their adolescent children.<sup>3</sup> This prevalence is far higher than declination of other vaccines routinely recommended for adolescents, such as for tetanus, diphtheria, and acellular pertussis (2%) or meningococcal (5%) vaccines.<sup>3,4,6</sup> Health care providers also report that parental refusal and delay of HPV vaccination are common.<sup>5,7</sup> To counsel

these parents, providers use time and resources that might otherwise be available for other important health promotion topics. Furthermore, parental declination can be a source of frustration for providers.<sup>8</sup> Many report believing there is little they can say to change parents' minds and that a lack of time limits their ability to discuss parents' concerns.<sup>5</sup>

The Centers for Disease Control and Prevention and other public health organizations encourage providers to give high-quality recommendations to prevent declination and to discuss the vaccine again at future visits if parents decline.<sup>9</sup> However, little is known about how often parents go on to accept HPV vaccination for their children after declination ("secondary acceptance"), or their reasons for doing so. Identifying modifiable contributors to secondary acceptance may help providers increase their success in counseling parents who refuse or delay vaccination. Thus, we sought to characterize secondary acceptance of HPV vaccination using data from a national sample of parents of adolescents. Our aims were to assess the prevalence and correlates of accepting HPV

vaccination after declination as well as parents' self-reported reasons for doing so.

## METHODS

### PARTICIPANTS AND PROCEDURES

We conducted a cross-sectional online survey of parents of adolescents in September 2016. Respondents were members of KnowledgePanel, a nationally representative panel of US adults maintained by the survey research company GfK.<sup>10</sup> GfK recruits panel members using a probability-based sampling approach consisting of random-digit dialing supplemented with address-based sampling. To ensure that panel participation is accessible to lower-income participants, GfK provides internet access and a digital device to households that lack these resources. Participants with established internet access instead receive points toward small cash payments. These incentives are provided for ongoing participation in the panel across multiple surveys.

Eligible panel members for our survey were parents of an 11- to 17-year-old child living primarily in their household. GfK invited 2580 parents to participate; 1253 completed the survey after giving informed consent. The survey's response rate was 59%, calculated using the American Association for Public Opinion Research formula 4.<sup>11</sup> For parents with more than one 11- to 17-year-old child, we asked them to consider the child with the most recent birthday as the index child for the survey. The study respondents were similar in demographic characteristics to parents of 11- to 17-year-old children in the US population. In the present study, we focused on the subset of parents who reported having: 1) discussed HPV vaccination with their child's healthcare provider at least once ( $n = 795$ ), and 2) declined HPV vaccination for their child during the initial discussion ( $n = 494$ ). Consistent with previous studies of parents who declined HPV vaccination for their children, we observed a higher proportion of white, non-Hispanic, and higher-income parents in this subset of 494 parents compared with the overall survey sample.<sup>12,13</sup> Harvard Pilgrim Health Care Institute's institutional review board approved the study protocol.

### MEASURES

#### SECONDARY ACCEPTANCE OF HPV VACCINATION

We assessed the primary outcome, secondary acceptance of HPV vaccination, with a single item: "Did [CHILD'S NAME] get the HPV vaccine at a later visit?" [Yes/No]. Parents who indicated "yes" were asked to endorse one or more reasons for secondary acceptance from a list of 9 options (eg, the child got older, the parent learned more about HPV vaccine or diseases caused by HPV, the doctor recommended it). Parents who indicated that their child was not vaccinated at a later visit reported on their intention to get HPV vaccine for their child in the next 12 months. We dichotomized parents as either intending to accept HPV vaccination [definitely/probably will] or not [definitely/probably won't].

#### VACCINATION CONFIDENCE

To understand the context of secondary acceptance, we assessed parents' confidence in adolescent vaccination with a series of 4 questions adapted from a validated scale ( $\alpha = .87$ ).<sup>6,14</sup> Parents reported on a scale of 1 (strongly disagree) to 5 (strongly agree) the extent of their agreement with statements about vaccination effectiveness, safety, importance, and the likelihood of getting a vaccine-preventable disease if unvaccinated. We averaged responses to the 4 items and categorized mean vaccination confidence scores as low (1.0–3.9), medium (4.0–4.9), or high (5.0), on the basis of previously developed cut points associated with parental refusal or delay of adolescent vaccination.<sup>6,15</sup>

#### PARENT-PROVIDER RELATIONSHIP QUALITY

We assessed parents' perceptions of the quality of their relationship with their child's healthcare provider using a validated index of 4 items ( $\alpha = .78$ ) adapted from Saha et al.<sup>16</sup> Parents reported on a scale of 1 (strongly disagree) to 5 (strongly agree) their overall satisfaction with the quality of their child's health care, the extent that their child's provider gives them the information they need, the extent that their child's provider gives them the time they need, and their overall trust in the provider. We averaged responses to the 4 items and categorized mean relationship quality scores as low (1.0–3.9), medium (4.0–4.9), and high (5.0).

#### PROVIDER RECOMMENDATION QUALITY

The survey asked parents to recall if their child's provider recommended HPV vaccination the first time it was discussed. For those who indicated "yes," we used a validated index to assess 3 recommendation quality indicators: strength of endorsement, prevention message, and urgency.<sup>17,18</sup> We summed the number of reported indicators to create a measure of overall provider recommendation quality: no recommendation, low-quality recommendation (0–1 indicators), or high-quality recommendation (2–3 indicators).

#### SATISFACTION WITH PROVIDER'S HPV VACCINE COMMUNICATION

We assessed parents' satisfaction with provider communication on the basis of their agreement on a scale of 1 (strongly disagree) to 5 (strongly agree) with 7 statements ( $\alpha = .94$ ), including items on clarity and content of message, as well as provider responsiveness to questions and concerns. We averaged responses and categorized mean satisfaction scores as low (1.0–3.9), medium (4.0–4.9), or high (5.0).

#### FOLLOW-UP COUNSELING

Parents indicated receipt of follow-up counseling after a declination in response to the following question: "Did [CHILD'S NAME]'s doctor or health care provider ever talk to you again at a later visit about getting the HPV vaccine for [him/her]?" [Yes/No].

### DEMOGRAPHIC CHARACTERISTICS

We assessed the child's age and sex. We also asked parents the child's age of the child the first time they discussed the HPV vaccine with their child's provider. We subtracted the child's age at first discussion from the child's age at the time of the survey to assess the amount of time that had passed in years since the first discussion. We also collected information on parents' sex, race/ethnicity, marital status, and educational attainment, as well as annual household income and geographic region.<sup>10,19</sup>

### STATISTICAL ANALYSIS

We calculated descriptive statistics to characterize the sample and parents' reasons for secondary acceptance. We assessed whether parents' reasons for secondary acceptance varied according to receipt of follow-up counseling using Pearson chi-square tests. We used logistic regression to identify bivariate correlates of secondary acceptance. We then entered statistically significant bivariate correlates ( $P < .10$ ) into a multivariable model. We conducted analyses using Stata version 14.2 (StataCorp, College Station, Texas). Statistical tests were 2-tailed with a critical  $\alpha$  of .05 unless otherwise noted.

## RESULTS

### SAMPLE CHARACTERISTICS

Half of parents in our sample reported on a son (50%; [Table 1](#)), and the average child age was 14 years (standard deviation [SD], 2.0 years). Approximately half of the parents were female (52%), and most were non-Hispanic white (72%), Hispanic (17%), or non-Hispanic black (8%). More than one-third had a high school degree or less education (35%). Parents reported from all regions of the United States.

The average child age at the first discussion about HPV vaccine with a health care provider was 12 years (SD, 1.6 years), and on average, the first discussion had occurred 2.1 years (SD, 1.6) before the survey. More than three-quarters (78%;  $n = 383$ ) of parents reported having received a recommendation for HPV vaccination from their child's provider the first time it was discussed. Among these 383 parents, 288 (or 75%) received a high-quality initial recommendation, and 95 (or 25%) received a low-quality initial recommendation. Overall, only approximately half (53%) of parents reported receiving follow-up counseling after declination.

### PREVALENCE OF AND REASONS FOR SECONDARY ACCEPTANCE

Almost half (45%) of parents who initially declined HPV vaccination for their child reported accepting it at a later visit. An additional 24% intended to accept HPV vaccination for their child in the next year. Parents' most commonly reported reasons for secondary acceptance were the child getting older (45%), learning more about HPV vaccine (34%), and receiving a provider recommendation (33%). The least frequently reported

**Table 1.** Sample Characteristics (N = 494)

| Characteristic             | n   | %  |
|----------------------------|-----|----|
| Child                      |     |    |
| Sex                        |     |    |
| Female                     | 247 | 50 |
| Male                       | 247 | 50 |
| Age, years                 |     |    |
| 11 to 12                   | 131 | 27 |
| 13 to 15                   | 211 | 43 |
| 16 to 17                   | 152 | 31 |
| Parent                     |     |    |
| Sex                        |     |    |
| Female                     | 255 | 52 |
| Male                       | 239 | 48 |
| Educational attainment     |     |    |
| High school degree or less | 175 | 35 |
| Some college, no degree    | 129 | 26 |
| College degree or more     | 190 | 38 |
| Marital status             |     |    |
| Married                    | 408 | 83 |
| Not married                | 86  | 17 |
| Race/ethnicity             |     |    |
| Non-Hispanic white         | 357 | 72 |
| Non-Hispanic black         | 37  | 8  |
| Hispanic                   | 86  | 17 |
| Other                      | 14  | 3  |
| Household characteristics  |     |    |
| Annual Income              |     |    |
| <\$35,000                  | 84  | 17 |
| \$35,000 to \$74,999       | 138 | 28 |
| ≥\$75,000                  | 272 | 55 |
| Region of United States    |     |    |
| Northeast                  | 91  | 18 |
| Midwest                    | 127 | 26 |
| South                      | 163 | 33 |
| West                       | 113 | 23 |

reason was the belief that the child might become sexually active (7%).

Reasons for secondary acceptance differed on the basis of whether parents had received follow-up counseling from their child's provider ([Figure](#)). Parents who received follow-up counseling were more likely than those who did not to report the following reasons: the child got older (52% vs 29%,  $P < .01$ ), they learned more about HPV vaccine (40% vs 22%;  $P < .05$ ), the doctor recommended it (39% vs 19%;  $P < .05$ ), or they learned more about HPV (24% vs 13%;  $P < .05$ ). They were less likely to report secondary acceptance because they thought their child needed HPV vaccine for school (5% vs 19%;  $P < .001$ ).

### CORRELATES OF SECONDARY ACCEPTANCE

In multivariable analyses, secondary acceptance was more commonly reported by parents who received a high-quality provider recommendation during the first discussion (vs no recommendation; adjusted odds ratio [aOR], 1.78; 95% confidence interval [CI], 1.04–3.04), received follow-up counseling (vs none; aOR, 2.16; 95% CI, 1.42–3.28), had high vaccination confidence (vs low confidence; aOR, 1.99; 95% CI, 1.03–3.83), or reported high or medium satisfaction with provider communication during the first discussion (vs low satisfaction; aOR, 3.72; 95% CI, 1.90–7.25; aOR, 2.11; 95% CI, 1.22–3.65; [Table 2](#)).

**Table 2.** Correlates of Secondary Acceptance of HPV Vaccination (N = 494)

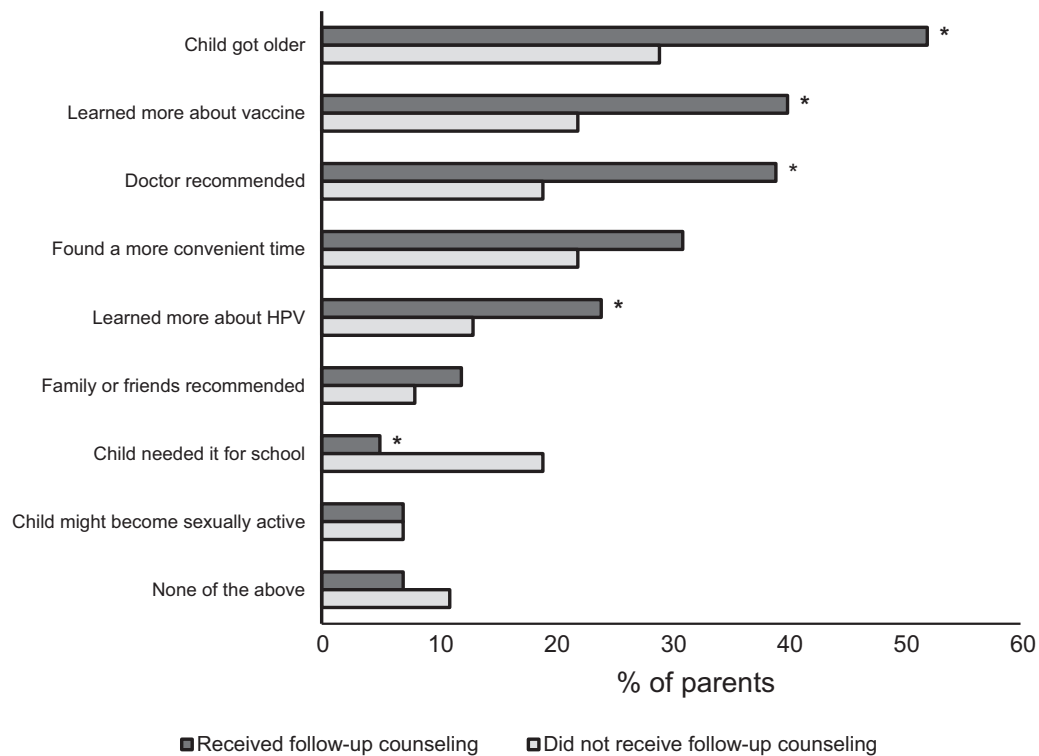
|   | n/N*    | %*  | Secondary Acceptance of HPV Vaccination |           |               |           |
|---|---------|-----|---|-----------|---------------|-----------|
|   |         |     | Bivariate                               |           | Multivariable |           |
|   |         |     | aOR                                     | 95% CI    | aOR           | 95% CI    |
| Child characteristics                                   |         |     |   |           |               |           |
| Sex   |         |     |   |           |               |           |
| Male  | 104/247 | 42  | 1                                       |           | —             |           |
| Female  | 116/247 | 47  | 1.22                                    | 0.85–1.74 | —             |           |
| Age, years  |         |     |   |           |               |           |
| 11 to 12  | 32/131  | 24  | 1                                       |           | 1             |           |
| 13 to 15  | 113/211 | 54  | 3.57                                    | 2.20–5.77 | 2.07          | 1.16–3.68 |
| 16 to 17  | 75/152  | 49  | 3.01                                    | 1.81–5.02 | 1.02          | 0.51–2.01 |
| Mean years from initial discussion (SD)                 | 2.7     | 1.6 | 1.57                                    | 1.38–1.78 | 1.59          | 1.34–1.88 |
| Parent characteristics                                  |         |     |   |           |               |           |
| Sex   |         |     |   |           |               |           |
| Male  | 115/239 | 48  | 1                                       |           | —             |           |
| Female  | 105/255 | 41  | 0.75                                    | 0.53–1.08 | —             |           |
| Educational Attainment                                  |         |     |   |           |               |           |
| High school degree or less                              | 84/175  | 48  | 1                                       |           | —             |           |
| Some college, no degree                                 | 49/129  | 38  | 0.66                                    | 0.42–1.05 | —             |           |
| College degree or more                                  | 87/190  | 46  | 0.92                                    | 0.61–1.38 | —             |           |
| Marital status  |         |     |   |           |               |           |
| Not married   | 36/86   | 42  | 1                                       |           | —             |           |
| Married   | 184/408 | 45  | 1.14                                    | 0.47–1.11 | —             |           |
| Race/ethnicity  |         |     |   |           |               |           |
| Non-Hispanic white                                      | 155/357 | 43  | 1                                       |           | —             |           |
| Non-Hispanic black                                      | 21/37   | 57  | 1.71                                    | 0.86–3.39 | —             |           |
| Hispanic  | 35/86   | 41  | 0.89                                    | 0.55–1.44 | —             |           |
| Other   | 9/14    | 64  | 2.35                                    | 0.77–7.14 | —             |           |
| Household characteristics                               |         |     |   |           |               |           |
| Annual Income   |         |     |   |           |               |           |
| <\$35,000   | 32/84   | 38  | 1                                       |           | —             |           |
| \$35,000 to \$74,999                                    | 67/138  | 49  | 1.53                                    | 0.88–2.66 | —             |           |
| ≥\$75,000   | 121/272 | 45  | 1.30                                    | 0.79–2.15 | —             |           |
| Region of United States                                 |         |     |   |           |               |           |
| Northeast   | 45/91   | 49  | 1                                       |           | —             |           |
| Midwest   | 60/127  | 47  | 0.92                                    | 0.53–1.57 | —             |           |
| South   | 67/163  | 41  | 0.71                                    | 0.43–1.20 | —             |           |
| West  | 48/113  | 42  | 0.75                                    | 0.43–1.31 | —             |           |
| Parent attitudes and provider communication             |         |     |   |           |               |           |
| Vaccination confidence†                                 |         |     |   |           |               |           |
| Low   | 42/134  | 31  | 1                                       |           | 1             |           |
| Medium  | 109/247 | 44  | 1.73                                    | 1.11–2.69 | 1.21          | 0.72–2.04 |
| High  | 69/113  | 61  | 3.44                                    | 2.03–5.81 | 1.99          | 1.03–3.83 |
| Parent-provider relationship quality†                   |         |     |   |           |               |           |
| Low   | 40/114  | 35  | 1                                       |           | 1             |           |
| Medium  | 97/230  | 42  | 1.35                                    | 0.85–2.15 | 0.91          | 0.52–1.60 |
| High  | 83/150  | 55  | 2.29                                    | 1.39–3.78 | 1.13          | 0.57–2.24 |
| Satisfaction with provider's HPV vaccine communication† |         |     |   |           |               |           |
| Low   | 45/156  | 29  | 1                                       |           | 1             |           |
| Medium  | 82/190  | 43  | 1.87                                    | 1.19–2.94 | 2.11          | 1.22–3.65 |
| High  | 93/148  | 63  | 4.17                                    | 2.58–6.75 | 3.72          | 1.90–7.25 |
| Initial provider recommendation quality                 |         |     |   |           |               |           |
| None  | 33/111  | 30  | 1                                       |           | 1             |           |
| Low-quality   | 40/95   | 42  | 1.72                                    | 0.97–3.06 | 1.74          | 0.90–3.37 |
| High-quality  | 147/288 | 51  | 2.46                                    | 1.54–3.93 | 1.78          | 1.04–3.04 |
| Receipt of follow-up counseling                         |         |     |   |           |               |           |
| No  | 72/233  | 31  | 1                                       |           | 1             |           |
| Yes   | 148/261 | 57  | 2.93                                    | 2.02–4.24 | 2.16          | 1.42–3.28 |

CI indicates confidence interval; HPV, human papillomavirus; aOR, adjusted odds ratio; and SD, standard deviation.

Dashes (—) indicate the variable was not included in the multivariable model because it was not statistically significant at the bivariate level.

\*Data are n/N and % except where otherwise stated.

†Responses were categorized as low (1.0–3.9), medium (4–4.9), and high (5).



**Figure.** Reasons for secondary acceptance of human papillomavirus (HPV) vaccination ( $N = 220$ ). \* $P < .05$  for chi-square test comparing parents who received follow-up counseling with those who did not.

Increasing time since the initial discussion was also associated with secondary acceptance (aOR, 1.59; 95% CI, 1.34–1.88). Parents of 13- to 15-year-old children had approximately 2 times higher odds of secondary acceptance compared with parents of 11- to 12-year-old children (aOR, 2.07; 95% CI, 1.16–3.68). Although quality of the parent-provider relationship was significant in the bivariate analysis, it was not significant at the multivariable level.

## DISCUSSION

Parental declination is a recognized contributor to low HPV vaccination coverage, but little research to date has examined the trajectory of parents' decision-making after HPV vaccine refusal or delay. Previous research has suggested indirectly that some parents who report declination subsequently choose to vaccinate their children,<sup>3,4</sup> but to our knowledge, our study is the first to directly assess the self-reported prevalence of secondary acceptance. Findings from this national survey suggest that secondary acceptance of HPV vaccination is common. Almost half of parents who initially declined HPV vaccine reported accepting it for their child at a later visit, and another quarter intended to do so in the next 12 months. Although prevalence of secondary acceptance was higher for children ages 13 to 15 years, we did not observe substantial variation according to other demographic factors, such as child's sex, parent's educational attainment, household income, or US region. These results are encouraging because they suggest that, across demographic groups, many of the estimated 36% of US parents who decline HPV vaccination for their children eventually reconsider.<sup>3</sup> In this way, our

findings raise the possibility that parents' decision-making about HPV vaccination might be more fluid and amenable to intervention than some providers perceive it to be.<sup>5</sup>

Our findings suggest that follow-up counseling is important for secondary acceptance. Parents who received such counseling from their child's healthcare provider had more than twice the odds of reporting that they accepted HPV vaccine at a later visit. However, only half of parents indicated they had received follow-up counseling, highlighting substantial missed opportunities for providers to deliver additional HPV vaccine recommendations and education. Providers can directly address 2 of parents' top 3 reasons for secondary acceptance through follow-up counseling: learning more about HPV vaccine and receiving a provider recommendation. Interestingly, parents in our study who received follow-up counseling were more likely to report as their reason for secondary acceptance that they learned more about the vaccine, and that they received a provider recommendation than parents who did not receive such counseling. Follow-up counseling might also be important for meeting parents' communication preferences; our previous research suggests that many parents who refuse or delay HPV vaccination prefer to decide about the vaccine at a later visit rather than the same day.<sup>3</sup> Although providers should continue to prioritize the goal of preventing declination, follow-up counseling is likely to play an important role in parental acceptance of HPV vaccination when declination does occur.

A novel contribution of this study is our finding that parents who were more satisfied with their provider's initial HPV vaccine-related communication or who recalled



initially receiving a high-quality recommendation were more likely to report getting their child vaccinated at a later visit. Although the cross-sectional study design limits our ability to infer directionality in these relationships, the findings are consistent with previous research on provider communication and parents' initial decision to vaccinate.<sup>20–25</sup> For secondary acceptance, the initial quality of provider communication and recommendation potentially influences parents' decision-making in terms of readiness to vaccinate (ie, readiness to change).<sup>26,27</sup> Even in the case of parents who decline, high-quality provider communication might prime them to further consider their decision and move over time toward acceptance. Regardless of the mechanism, our findings speak to the need for improving provider communication about HPV vaccination, because approximately one-third of parents in our sample reported lower levels of satisfaction with their provider's communication and approximately one-fifth did not recall receiving a recommendation.

Our study has implications for future translational research on provider communication with parents at risk for declining HPV vaccination. First, time since the initial provider discussion as well as parents' vaccination confidence were associated with secondary acceptance. These findings suggest that, in addition to interventions to support providers in making high-quality recommendations, providers need efficient communication strategies for improving parents' vaccination confidence and perception of the importance of on-time vaccination. Qualitative research suggests some parents of adolescent girls delay on-time HPV vaccination because they believe their daughters are not yet at risk for acquiring HPV and would like to wait for more information on the vaccine's safety and long-term efficacy.<sup>28</sup> Helping parents achieve a better understanding of the higher immune response produced by the vaccine in younger adolescents could potentially increase vaccination confidence and reduce declination. New dosing guidelines, which now recommend 2, rather than 3, doses for adolescents who initiate the vaccine before age 15 years might also encourage on-time vaccination.<sup>29</sup> Finally, future research is needed on strategies to encourage follow-up counseling after declination, including the effect of parental declination forms and reminder/recall systems. On the basis of parents' reported reasons for secondary acceptance, our study suggests that follow-up counseling that increases parents' knowledge about HPV vaccine and HPV infection, and includes a provider recommendation for vaccination may be most effective in promoting secondary acceptance.

### STRENGTHS AND LIMITATIONS

Strengths of our study include novel data on secondary acceptance, and a large national sample that comes from an online survey panel that is similar in composition to the US population.<sup>30</sup> A study limitation is the potential for recall bias. Parents who eventually accepted HPV vaccination might have been more likely to remember receiving follow-up counseling, particularly if that coun-

seling caused them to change their mind about vaccination. Other potential limitations include self-reported measures and a cross-sectional study design. Although the use of parental self-report is a potential limitation, previous research suggests that most parents accurately recall whether their child started the HPV vaccine series.<sup>31,32</sup> In addition, self-report allowed us to more fully understand parents' perspectives on what influenced their decision-making regarding secondary acceptance. Future prospective research on parent-provider interactions, with data on primary and secondary decisions about vaccination, can build on our findings by validating parental report of declination and secondary acceptance with provider-reported measures.

### CONCLUSIONS

Although many providers report frustration with counseling vaccine-hesitant parents,<sup>5</sup> findings from this national survey suggest that parents' decisions about HPV vaccination may change over time. An initial high-quality provider recommendation and subsequent follow-up counseling after declination are promising strategies to promote secondary acceptance. Our findings are encouraging for providers who encounter parental declination and suggest that they can motivate HPV vaccine acceptance by delivering repeated, high-quality recommendations.

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