Published in final edited form as:
*J Adolesc Health*. 2011 March ; 48(3): 314–317. doi:10.1016/j.jadohealth.2010.07.006.

# Mother-daughter communication about HPV vaccine

**Annie-Laurie McRee, M.P.H**[a], **Paul L. Reiter, Ph.D.**[a,b], **Sami L. Gottlieb, M.D.,M.S.P.H**[c], and **Noel T. Brewer, Ph.D.**[a,b]

[a]UNC Gillings School of Global Public Health, Centers for Disease Control and Prevention

[b]Lineberger Comprehensive Cancer Center, Centers for Disease Control and Prevention

[c]Division of STD Prevention, Centers for Disease Control and Prevention

## Abstract

**Purpose—**Parent-child conversations about HPV vaccine may provide parents with opportunities to talk with their daughters about sexual health. We sought to characterize mothers' communication with their adolescent daughters about HPV vaccine.

**Methods—**We surveyed 609 mothers of girls aged 11–20 living in North Carolina in fall 2008. We used logistic regression to identify correlates of mother-daughter communication.

**Results—**Most mothers (81%) reported discussing HPV vaccine with their daughters. For almost half of these families (47%), discussing HPV vaccine led to a conversation about sex. This was more common among mothers who believed their daughters may be sexually active (OR: 1.88, 95%CI: 1.25–2.83), had greater knowledge of HPV vaccine (OR: 2.46, 95%CI: 1.07–5.64), lived in urban areas (OR: 1.75, 95%CI: 1.21–2.54), or reported being born-again Christians (OR: 1.74, 95%CI: 1.17–2.58). Most mothers who talked with their daughters about HPV vaccine reported discussing reasons for and against getting vaccinated (86%). Mothers most commonly reported discussing potential HPV vaccine benefits, usually protection against cervical cancer (56%), and less frequently reported discussing perceived negatives of HPV vaccine.

**Conclusions—**HPV vaccine conversations may provide opportunities for sexual health promotion and STI prevention.

### Keywords

HPV; HPV vaccine; parent-child communication

Current guidelines recommend routine human papillomavirus (HPV) vaccination for adolescent girls aged 11–12 with catch-up vaccination for girls and women aged 13–26 [1]. While many adolescents make HPV vaccination decisions along with their parents [2,3], we know little about parents' conversations with their daughters about HPV vaccine. As HPV is



Corresponding author: Annie-Laurie McRee, MPH; UNC Gillings School of Global Public Health; Department of Health Behavior and Health Education; 325 Rosenau Hall, CB 7440; Chapel Hill, NC 27599; Phone: (919)843-3105; Fax: (919)966-2921; almcree@email.unc.edu.
Requests for reprints should be sent to: Noel T. Brewer, PhD; UNC Gillings School of Global Public Health; Department of Health Behavior and Health Education; 325 Rosenau Hall, CB 7440; Chapel Hill, NC 27599; ntb1@unc.edu



Portions of this paper were presented at the 2009 Annual Meeting of the American Public Health Association.

a sexually transmitted infection (STI), HPV vaccine conversations may provide parents with natural opportunities to talk with their daughters about sexual health and STI prevention. This is important because parent-child communication about sex, particularly mother-daughter communication, is associated with decreased adolescent sexual risk taking and, like HPV vaccination, is most beneficial if it occurs before sexual debut [4,5]. The purpose of this study was to characterize mothers' communication with their adolescent daughters about HPV vaccine and whether these conversations lead to discussions about sex.

## Methods

We report the methods for our study in detail elsewhere [6]. At baseline, trained personnel used computer-assisted telephone interviewing equipment to survey caregivers for females aged 10 to 18 years in southeastern North Carolina counties with elevated rates of cervical cancer. Of 1,220 eligible caregivers contacted, 889 (73%) completed baseline telephone interviews between July and October 2007. Interviewers re-contacted 650 (74%) of eligible baseline respondents by telephone during fall 2008. Data for the present study are from 609 female caregivers who provided information at follow-up about communication with their daughters, who were by then aged 11–20. We excluded data from male caregivers (n=38) and respondents who provided only partial data (n=3). Because the majority of caregivers (96%) reported being the child's parent, for the sake of simplicity, we refer to all respondents as mothers. The University of North Carolina Institutional Review Board approved the study.

The survey is available at http://www.unc.edu/~ntbrewer/hpv.htm. The primary outcomes were mothers' report of communicating with their daughters about HPV vaccine, and whether talking about HPV vaccine led to a discussion about sex. Interviewers asked whether mothers had discussed reasons for or against getting HPV vaccine, followed by an open-ended question assessing content, "What did you discuss?" The survey also assessed beliefs about HPV vaccine and characteristics of daughters, mothers and their households that may be associated with communication.

### Data analysis

We first used logistic regression to identify bivariate correlates of whether mothers had talked with their daughters about HPV vaccine, and then conducted a multivariate regression using all variables associated ($p<.10$) in bivariate analyses. We repeated this two-step regression approach for discussions about sex as a result of discussing HPV vaccine. Finally, we examined content of HPV vaccine discussions, assessing differences by whether the daughter was vaccinated using chi-square analyses. Analyses used Stata SE version 10.0 (Statacorp, College Station, TX).

## Results

Most mothers (81%, 496/609) reported having talked about HPV vaccine with their adolescent daughters (Table 1). In multivariate analyses, communication about HPV vaccine was more likely among mothers whose daughters had been vaccinated, who had received a doctor's recommendation to get their daughters HPV vaccine, or who had greater knowledge of HPV vaccine. Communication was also more likely among mothers with daughters aged 15–17 or 18–20 than those aged 11–14 years, and among those whose annual household income was at least $60,000. Non-Hispanic black mothers were less likely than non-Hispanic white mothers to discuss HPV vaccine with their daughters.

Of mothers who talked with their daughters about HPV vaccine, almost half (47%, 231/496) reported that doing so led to a discussion with their daughters about sex (Table 2). In

multivariate analyses, communication about sex in the context of HPV vaccine was more likely among mothers who reported being born-again Christians, lived in urban areas, believed their daughters may be sexually active, or had greater knowledge of HPV vaccine.

Most mothers who talked with their daughters about HPV vaccine reported talking about reasons for and against getting vaccinated against HPV (86%). Among mothers whose daughters had received HPV vaccine, the majority (90%) reported having these discussions prior to vaccination. Mothers most commonly reported discussing HPV vaccine benefits, usually protection against cervical cancer (56%). They less frequently reported discussing HPV vaccine negatives, including unknown long-term effects (12%) and potential or perceived side effects such as painful injections (8%). We found few differences in content by daughters' vaccination status, in bivariate analyses (data available upon request).

## Discussion

The vast majority of mothers in our sample had discussed HPV vaccine with their daughters, consistent with a recent study conducted among adolescent girls [7]. A novel finding in our study is that many mothers also discussed sex as a part of these conversations. Increasing mothers' communication about HPV vaccine with their pre-adolescent and young adolescent daughters may, in turn, facilitate mother-daughter discussions about sexual health during this important window of opportunity. While most mothers in our sample discussed HPV vaccine with their daughters, some parents may be hesitant to do so precisely because they feel unprepared or do not want to talk with their daughters about sex [8]. Health care providers may be able to use HPV vaccination visits to provide guidance to parents about discussing sexuality with their children, and to offer developmentally-appropriate sexual health education and counseling directly to adolescents [9].

Our study's main limitation is reliance on mothers' reports, which may not fully reflect actual conversations. Findings related to the content of discussions may over-emphasize reasons for and against getting HPV vaccine based on the order of survey questions. Additionally, as all mothers received a brief informative statement about HPV vaccine at baseline, communication at follow-up may have been somewhat higher in our sample than in the general population.

Our findings highlight the potential for HPV vaccine to facilitate sexual health promotion and STI prevention efforts. For this strategy to be most successful, efforts should focus on improving parents' knowledge about HPV vaccine and encouraging parents of younger adolescents to talk about HPV vaccine and sexual health with their children. Future research is needed to explore how health care providers can capitalize on widespread HPV vaccine implementation to provide sexual health and STI prevention messages to adolescents and their parents.

## Acknowledgments

This study was supported by the Centers for Disease Control and Prevention (S3715-25/25), the American Cancer Society (MSRG-06-259-01-CPPB) and the Cancer Control Education Program at Lineberger Comprehensive Cancer Center (R25 CA57726). We thank Jennifer Smith, Lauri Markowitz, Nicole Liddon, Robert Agans, and the staff and interviewers at the UNC Survey Research Unit for their assistance in planning and conducting the survey.

## References

1. Markowitz LE, Dunne EF, Saraiya M, et al. Quadrivalent human papillomavirus vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep. 2007; 56:1–24. [PubMed: 17218934]

2. Mathur MB, Mathur VS, Reichling DB. Participation in the decision to become vaccinated against human papilloma virus by California high school girls and the predictors of vaccine status. J Pediatr Health Care. 2009; 24:14–24. [PubMed: 20122474]
3. McRee AL, Reiter PL, Brewer NT. Vaccinating adolescent girls against human papillomavirus–who decides? Prev Med. 2010; 50:213–214. [PubMed: 20153358]
4. Jaccard J, Dodge T, Dittus P. Parent-adolescent communication about sex and birth control: A conceptual framework. New Directions for Child and Adolescent Development. 2002
5. Miller KS, Levin ML, Whitaker DJ, Xu X. Patterns of condom use among adolescents: the impact of mother-adolescent communication. Am J Pub Health. 1998; 88:1542. [PubMed: 9772860]
6. Reiter PL, Brewer NT, Gottlieb SL, McRee AL, Smith JS. Parents' health beliefs and HPV vaccination of their adolescent daughters. Soc Sci Med. 2009; 69:475–480. [PubMed: 19540642]
7. Brabin L, Roberts SA, Stretch R, et al. A survey of adolescent experiences of human papillomavirus vaccination in the Manchester study. British Journal of Cancer. 2009; 101:1502–1504. [PubMed: 19809431]
8. Dempsey AF, Abraham LM, Dalton V, Ruffin M. Understanding the reasons why mothers do or do not have their adolescent daughter vaccinated against human papillomavirus. Ann Epidemiol. 2009
9. Hagan, JF.; Shaw, JS.; Paula Duncan, P., editors. Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents. 3rd ed.. Elk Grove, IL: American Academy of Pediatics; 2008.

**Table 1**

Sample characteristics and mother-daughter communication about HPV vaccine, *n=609*

| | Total | | Ever talked with daughter about HPV vaccine[a] | | Bivariate | | Multivariate | |
|---|---|---|---|---|---|---|---|---|
| | **n** | **(%)** | **n** | **(%)** | **OR** | **(95% CI)** | **OR** | **(95% CI)** |
| **Total** | 609 | (100.0) | 496 | (81.4) | | - | | - |
| **Daughter characteristics** | | | | | | | | |
| Age | | | | | | | | |
| 11–14 years (Ref) | 227 | (37.3) | 166 | (73.1) | 1.00 | - | 1.00 | - |
| 15–17 years | 218 | (35.8) | 184 | (84.4) | 1.99 | (1.24–3.18)** | 2.10 | (1.22–3.63)** |
| 18–20 years | 164 | (26.9) | 146 | (89.0) | 2.98 | (1.68–5.27)*** | 2.65 | (1.40–5.02)** |
| Mother's perception of daughter's sexual activity | | | | | | | | |
| Not sexually active (Ref) | 312 | (51.2) | 251 | (80.5) | 1.00 | - | | |
| May be sexually active | 204 | (33.5) | 164 | (80.4) | 1.00 | (0.61–1.55) | | |
| Sexually active | 93 | (15.3) | 81 | (87.1) | 1.64 | (0.84–3.20) | | |
| **Mother characteristics** | | | | | | | | |
| Age | | | | | | | | |
| <45 years (Ref) | 289 | (47.5) | 227 | (78.6) | 1.00 | - | | |
| 45+ years | 321 | (52.6) | 269 | (83.8) | 1.44 | (0.96–2.17) | 1.26 | (0.78–2.03) |
| Race/ethnicity | | | | | | | | |
| Non-Hispanic white (Ref) | 449 | (73.7) | 383 | (85.3) | 1.00 | - | 1.00 | - |
| Non-Hispanic black | 127 | (20.9) | 87 | (68.5) | 0.37 | (0.24–0.59)*** | 0.44 | (0.26–0.76)** |
| Hispanic or other | 33 | (5.4) | 26 | (78.8) | 0.64 | (0.27–1.53) | 0.65 | (0.24–1.77) |
| Education | | | | | | | | |
| High school or less (Ref) | 113 | (18.6) | 86 | (76.1) | 1.00 | - | | |
| Some college or more | 496 | (81.4) | 410 | (82.7) | 1.50 | (0.92–2.45) | | |
| Marital status | | | | | | | | |
| Other (Ref) | 83 | (13.6) | 63 | (75.9) | 1.00 | - | | |
| Married | 526 | (86.4) | 433 | (82.8) | 1.48 | (0.85–2.56) | | |
| Annual household income | | | | | | | | |
| <$60,000 (Ref) | 239 | (39.2) | 178 | (74.5) | 1.00 | - | 1.00 | - |
| $60,000+ | 343 | (56.3) | 296 | (86.3) | 2.16 | (1.41–3.30)*** | 1.80 | (1.11–2.93)* |
| Missing | 27 | (4.4) | 22 | (81.5) | 1.51 | (0.55–4.16) | 1.30 | (0.41–4.11) |
| Born-again Christian | | | | | | | | |
| No (Ref) | 207 | (34.0) | 175 | (84.5) | 1.00 | - | | |
| Yes | 402 | (66.0) | 321 | (79.9) | 0.72 | (0.46–1.34) | | |
| Area of residence | | | | | | | | |
| Rural (Ref) | 304 | (49.9) | 247 | (81.3) | 1.00 | - | | |
| Urban | 305 | (50.1) | 249 | (81.6) | 1.03 | (0.68–1.54) | | |
| **HPV vaccination** | | | | | | | | |
| Daughter has initiated HPV vaccine | | | | | | | | |

| | Total | | Ever talked with daughter about HPV vaccine[a] | | Bivariate | | Multivariate | |
|---|---|---|---|---|---|---|---|---|
| | n | (%) | n | (%) | OR | (95% CI) | OR | (95% CI) |
| No (Ref) | 392 | (64.4) | 283 | (72.2) | 1.00 | - | 1.00 | - |
| Yes | 217 | (35.6) | 213 | (98.2) | 20.51 | (7.44–56.51)*** | 11.20 | (3.96–31.79)*** |
| Doctor recommended daughter get HPV vaccine | | | | | | | | |
| No (Ref) | 461 | (75.7) | 351 | (76.1) | 1.00 | - | 1.00 | - |
| Yes | 148 | (24.3) | 145 | (98.0) | 15.15 | (4.73–48.47)*** | 6.64 | (2.00–22.07)*** |
| Parent believes daughter is in target age group for HPV vaccination | | | | | | | | |
| No (Ref) | 46 | (7.6) | 30 | (65.2) | 1.00 | - | 1.00 | - |
| Yes | 563 | (92.5) | 466 | (82.8) | 2.56 | (1.34–4.88)** | 1.44 | (0.68–3.05) |
| HPV vaccine knowledge, mean (SD)[b] | 0.66 | (0.23) | 0.68 | (0.22) | 8.76 | (3.57–21.53)*** | 3.81 | (1.39–10.41)** |

*Note*: Percents may not total 100% due to rounding. Multivariate model contains all correlates significant ($p<.10$) in bivariate models.

HPV=human papillomavirus; CI= confidence interval; OR= odds ratio; Ref= reference category; SD= standard deviation.

[a]Answered yes to the question: "Have you ever talked with [daughter's name] about HPV vaccine at all?"

[b]Proportion of correct responses on 5 HPV vaccine knowledge items (range: 0–1). Component items included knowledge that HPV vaccine: prevents most genital warts, prevents most cervical cancer, is recommended for 11–12 year old girls, works best if girls get it before they start having sex, and that women should continue to get pap smears after getting HPV vaccine.

*$P \leq .05$,

**$p \leq .01$,

***$P \leq .001$.

**Table 2**

Mother-daughter communication about sex in the context of HPV vaccine discussions, *n=496*

| | Talked about sex[a] | | Bivariate | | Multivariate | |
|---|---|---|---|---|---|---|
| | **n** | **(%)** | **OR** | **(95% CI)** | **OR** | **(95% CI)** |
| **Total** | 231 | (46.6) | | | | |
| **Daughter characteristics** | | | | | | |
| Age | | | | | | |
| 11–14 years (Ref) | 76 | (45.5) | 1.00 | - | | |
| 15–17 years | 91 | (49.5) | 1.16 | (0.76–1.76) | | |
| 18–20 years | 64 | (43.8) | 0.92 | (0.59–1.45) | | |
| Mother's perception of daughter's sexual activity | | | | | | |
| Not sexually active (Ref) | 103 | (41.0) | 1.00 | - | 1.00 | - |
| May be sexually active | 93 | (56.7) | 1.88 | (1.26–2.80)*** | 1.88 | (1.25–2.83)** |
| Sexually active | 35 | (43.2) | 1.09 | (0.59–1.81) | 1.23 | (0.73–2.09) |
| **Mother characteristics** | | | | | | |
| Age | | | | | | |
| <45 years (Ref) | 103 | (45.0) | 1.00 | - | | |
| 45+ years | 128 | (46.5) | 1.09 | (0.77–1.56) | | |
| Race/ethnicity | | | | | | |
| Non-Hispanic white (Ref) | 173 | (45.2) | 1.00 | - | | |
| Non-Hispanic black | 45 | (51.7) | 1.30 | (0.82–2.07) | | |
| Hispanic or other | 13 | (50.0) | 1.21 | (0.55–2.69) | | |
| Education | | | | | | |
| High school or less (Ref) | 38 | (44.2) | 1.00 | - | | |
| Some college or more | 193 | (47.1) | 1.12 | (0.70–1.79) | | |
| Marital status | | | | | | |
| Other (Ref) | 29 | (46.0) | 1.00 | - | | |
| Married | 202 | (46.7) | 1.02 | (0.60–1.74) | | |
| Annual household income | | | | | | |
| <$60,000 (Ref) | 87 | (48.9) | 1.00 | - | 1.00 | - |
| $60,000+ | 138 | (46.6) | 0.91 | (0.63–1.33) | 0.93 | (0.63–1.37) |
| Missing | 6 | (27.3) | 0.39 | (0.15–1.04) | 0.49 | (0.18–1.34) |
| Born-again Christian | | | | | | |
| No (Ref) | 68 | (38.9) | 1.00 | - | 1.00 | - |
| Yes | 163 | (50.8) | 1.62 | (1.12–2.36)* | 1.74 | (1.17–2.58)** |
| Area of residence | | | | | | |
| Rural (Ref) | 100 | (40.5) | 1.00 | - | 1.00 | - |
| Urban | 131 | (50.6) | 1.63 | (1.14–2.33)* | 1.75 | (1.21–2.54)** |
| **HPV vaccination** | | | | | | |
| Daughter has initiated HPV vaccine | | | | | | |
| No (Ref) | 130 | (45.9) | 1.00 | - | | |
| Yes | 101 | (47.4) | 1.06 | (0.74–1.52) | | |

| | Talked about sex[a] | | Bivariate | | Multivariate | |
|---|---|---|---|---|---|---|
| | **n** | **(%)** | **OR** | **(95% CI)** | **OR** | **(95% CI)** |
| Doctor recommended daughter get HPV vaccine | | | | | | |
| No (Ref) | 159 | (45.3) | 1.00 | - | | |
| Yes | 72 | (49.7) | 1.19 | (0.81–1.75) | | |
| Parent believes daughter is in target age group for HPV vaccination | | | | | | |
| No (Ref) | 12 | (40.0) | 1.00 | - | | |
| Yes | 219 | (47.0) | 1.33 | (0.63–2.82) | | |
| HPV vaccine knowledge, mean (SD)[b] | 0.71 | (0.22) | 2.26 | (1.02–5.02)* | 2.46 | (1.07–5.64)* |

*Note*: Table presents findings among mothers who reported talking about HPV vaccine with their daughter. Multivariate model contains all correlates significant ($p$<.10) in bivariate models. HPV=human papillomavirus; CI= confidence interval; OR= odds ratio; Ref= reference category; SD= standard deviation.

[a]Answered yes to the question: 'Did talking about HPV vaccine with [name] lead to a conversation about sex?"

[b]Proportion of correct responses on 5 HPV vaccine knowledge items (range: 0–1). Component items included knowledge that HPV vaccine: prevents most genital warts, prevents most cervical cancer, is recommended for 11–12 year old girls, works best if girls get it before they start having sex, and that women should continue to get pap smears after getting HPV vaccine.