

# Parental Human Papillomavirus Knowledge and Intentions to Vaccinate their Daughters

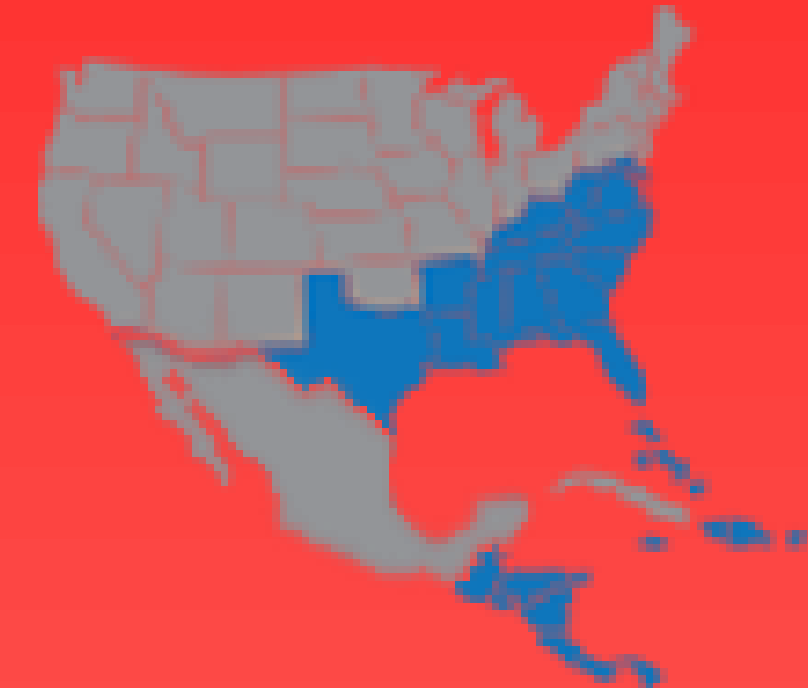
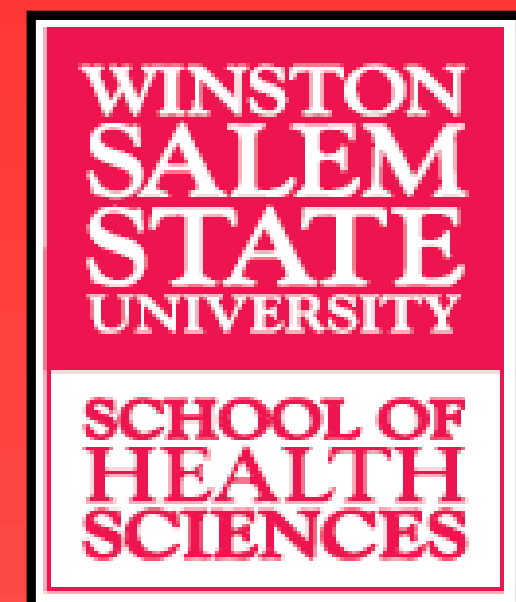
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## Problem

- The human papillomavirus (HPV) causes 66% of cervical cancers, with disproportionate incidence among Hispanic, African-American(AA), and American Indian/Alaskan Native women (Dunne, Markowitz, Saraiya et al., 2014).
  - 12,200 women are diagnosed with cervical cancer every year (Horner et al., 2011), and in 2010, 2.3 US women per 100,000 died from the disease (US Department of Health and Human Services [DHHS], 2014).
- HPV 6, 11, 16, and 18 are the four most commonly transmitted strands. HPV 16 and 18 confer particularly high risk for cervical cancer (Dunne et al., 2014).
  - In the United States, the estimated prevalence is 18% among girls aged 14-19, 45% among women aged 20-24, 27% among women aged 25-59, and 73% among men collectively (Reiter et al., 2010; Test, Caskey, & Rankin, 2013).
  - Non-Hispanic AA adolescent girls (33.7%) had a higher prevalence of HPV compared to non-Hispanic White girls (15.9%) and Mexican-American girls (14%) (Forhan et al., 2009).
- The three-dose HPV vaccine, Gardasil, is recommended to both adolescent girls and boys and protects against the four most common strains. However, less than 50% of girls are vaccinated (Stokley et al., 2014).
  - While the rate of initiating the vaccination increased from 25.1% to 57.3%, only 37.6% of adolescent girls complete the series.
  - Black and Hispanic girls are likely to initiate the vaccine at the same rate as non-Hispanic White girls but are less likely to complete the series (Kramer & Dunlop, 2012).
  - All three doses must be received for vaccine efficacy. Prophylactic vaccination reduced Papanicolaou test (Pap smear) abnormalities in HPV 16 by 92% and HPV 18 by 97% (Munoz et al., 2010).
  - Lack of parents' knowledge about HPV and fears about vaccine safety and efficacy are some of the factors that contribute to parents' refusal to have their daughters vaccinated (Stokley et al., 2014).
- The purpose of this study was to examine the associations between intentions to vaccinate for HPV and HPV knowledge among parents with daughters.

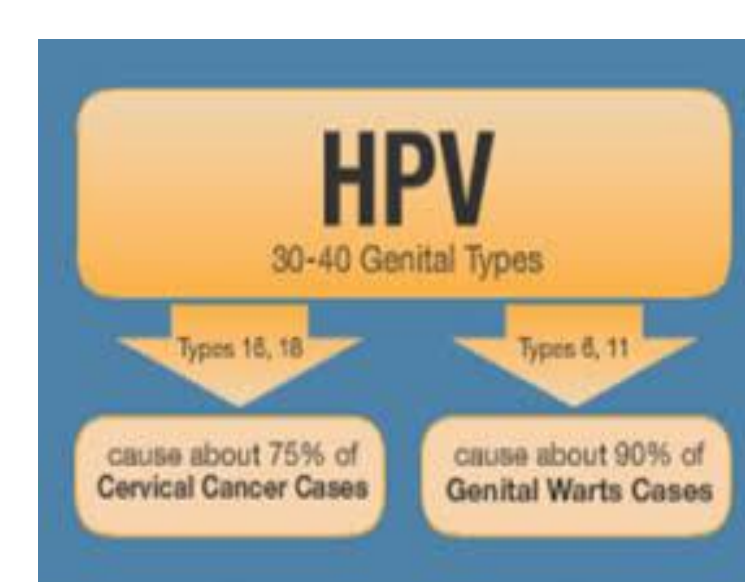
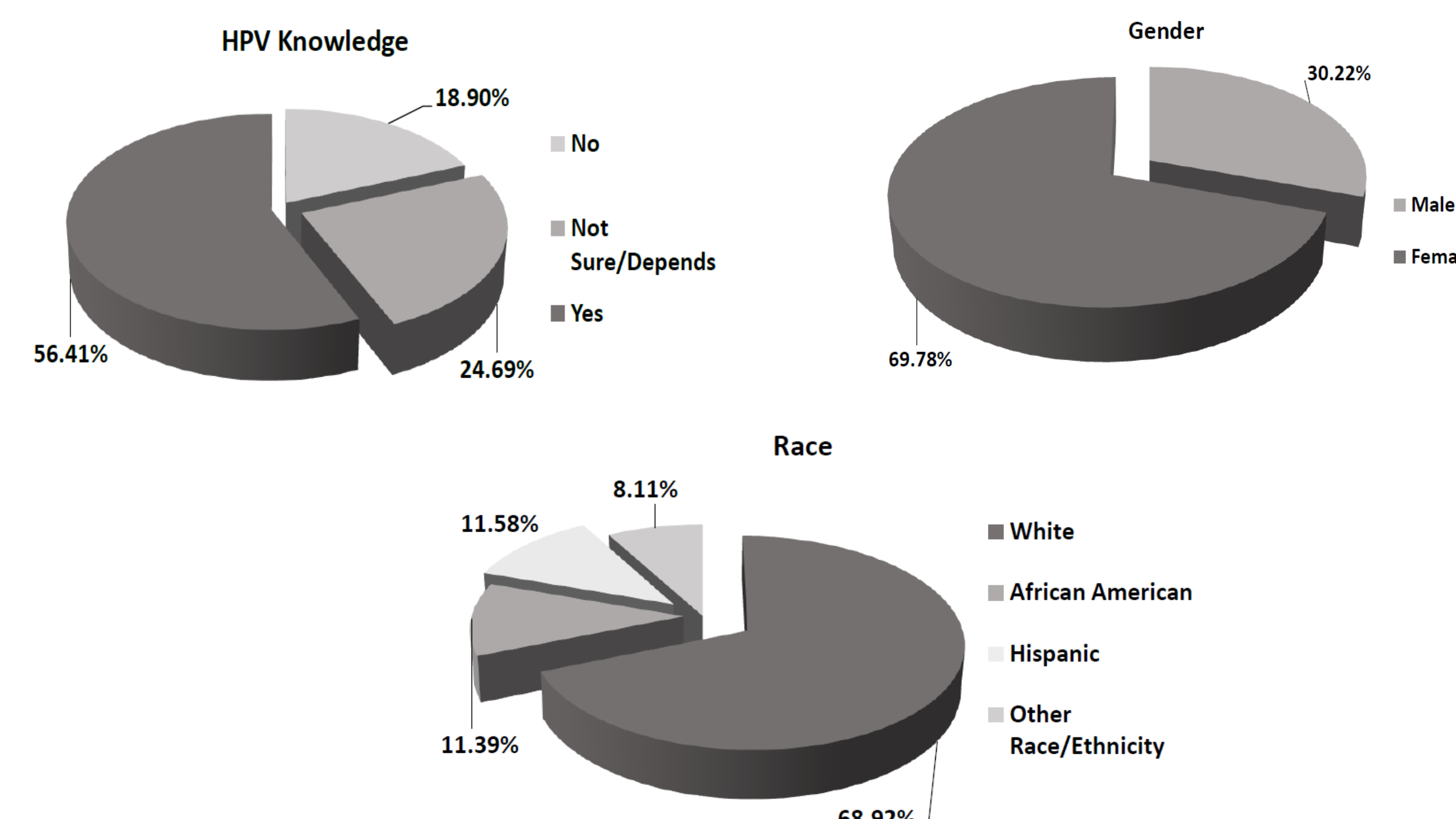


Figure 1 & 2. Illustration of the most common transmitted HPV strands and the Gardasil vaccine

## Materials and Methods

- Retrospective cross-sectional data from the 2006-2007 Health Information National Trends Survey (HINTS) were used (ICPSR, 2007).
- Data were weighted using "svyset" command to attaining linearized standard errors "robustness."
- Participants who responded to survey items capturing HPV knowledge and intentions to vaccinate their daughters for HPV were retained for all analysis.
- Main outcome measure (Intentions to Vaccinate Daughter Against HPV):
  - Categorical variable coded as - "0" (no), "1" (not sure/depends), and "2" (yes).
- Exposure variable (HPV Knowledge):
  - Dichotomous variable coded as - "0" (no [not knowledgeable]) and "1" (yes [knowledgeable]).
- Descriptive, bivariate, and univariate and multivariate multinomial logistic regression models analyses were estimated.
- Forward stepwise followed by manual variable selection method were used to identify covariates to control for in the final model.
- Covariates adjusted in the final model include:
  - Gender, age, race/ethnicity, education, income, employment and insurance.
- Relative Risk Ratios (RRRs) and 95% confidence intervals (CIs), statistical significance set at a two-tailed p-value of < .05. SPSS Version 22 and Stata/SE version 13.1 were used for all analysis (IBM Corp, 2013; StataCorp, 2013).
- Winston-Salem State University IRB#: 2986-16-0025

## Results



Figures 3, 4, and 5. Percentage of HPV knowledge, gender and race/ethnicity, Health Information National Trends Survey (HINTS) 2007-2009

- Extensiveness of intentions to vaccinate daughters, no (17.9%), were not sure/depends (22.71%), and had intentions (59.39%) among parents who were knowledgeable.
- Parents who were knowledgeable about HPV, 14.02% (n = 164), 17.52% (n = 208), and 55.98% (n = 544) indicated that they had no, were not sure/depends, or had intentions to vaccinate their daughters respectively,  $F(1.61, 78.68) = 10.66, p = 0.0002$ .

Tables 1. Differences between intentions to vaccinate daughters and HPV knowledge, Health Information National Trends Survey (HINTS) 2007-2009

Study Characteristics	Intentions to Vaccinate Daughter					P-Value
	No	Not Sure/Depends	Yes	n	%	
HPV Knowledge, n = 1,037						
No	32	3.63	48	4.4	41	4.45
Yes	164	14.02	208	17.52	544	55.98
Total	196	17.65	256	21.92	585	60.43

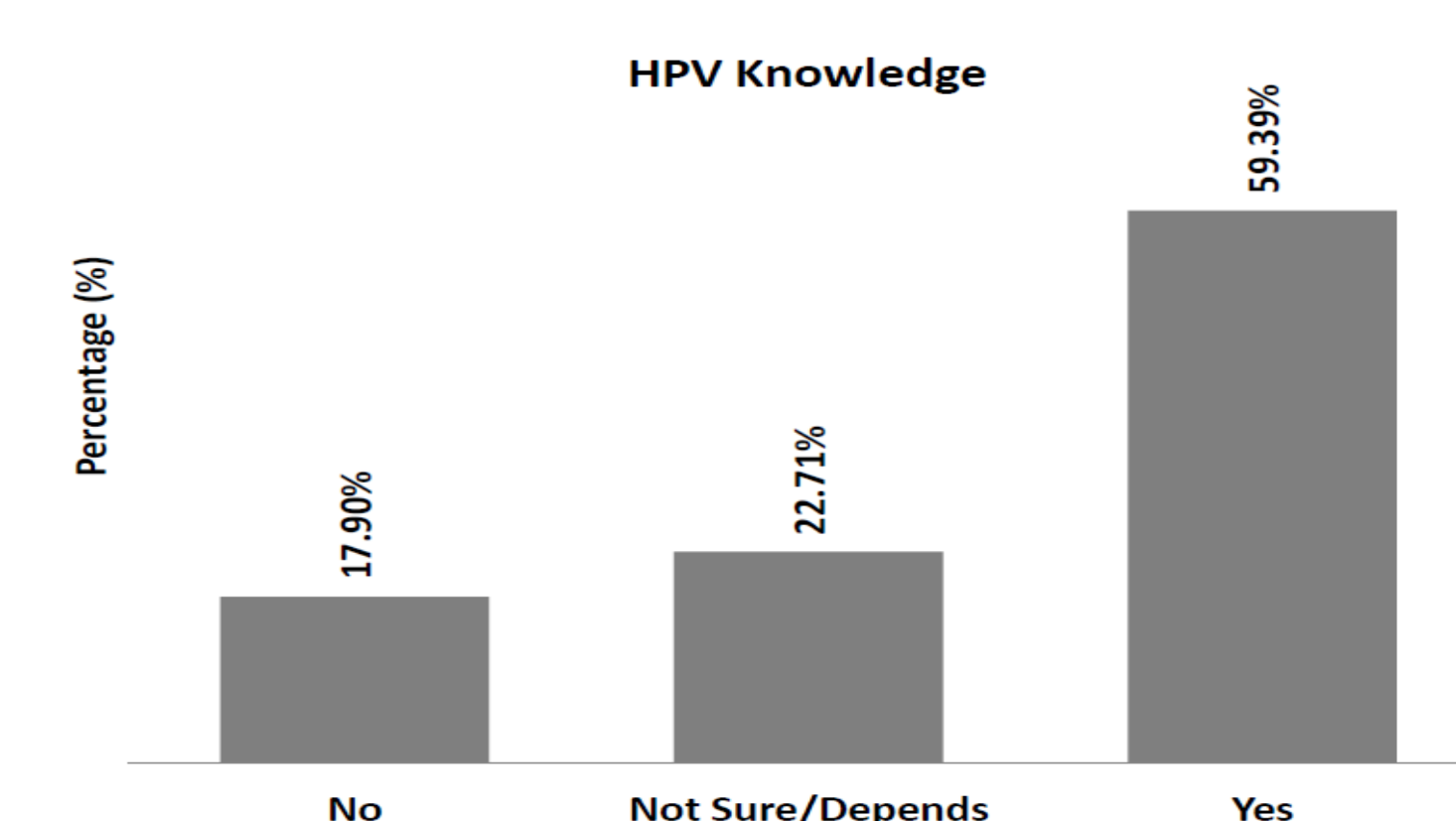


Figure 6. Extensiveness of intentions to vaccinate daughter (no, not sure/depends and yes) among parents who were knowledgeable, Health Information National Trends Survey (HINTS) 2007-2009

- Unadjusted results show that parents who were knowledgeable about HPV, were more likely to say they were not sure (uRRR = 1.03,  $p = 0.938$ ) or were sure (uRRR = 3.25,  $p = 0.004$ ) of vaccinating their daughters for HPV compared to those who were not knowledgeable
- After adjusting for other covariates, parents who were knowledgeable about HPV were more likely to say they were not sure (aRRR = 1.07,  $p = 0.867$ ) or were sure (aRRR = 3.96,  $p = 0.004$ ) of vaccinating their daughters for HPV compared to those who were not knowledgeable.

Unadjusted and adjusted multivariate multinomial logistic regression analysis of the Association between HPV knowledge and intentions to vaccinate daughters, Health Information National Trends Survey (HINTS) 2007-2009

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Tables 2 & 3. Unadjusted and adjusted multivariate multinomial logistic regression analysis of the association between HPV knowledge and intentions to vaccinate daughters, Health Information National Trends Survey (HINTS) 2007-2009

Intentions to Vaccinate Daughter*	Not Sure/Depends			Yes		
	uRRR <sup>b</sup>	p-value	95% CIs	uRRR <sup>b</sup>	p-value	95% CIs
HPV Knowledge						
No	Ref.			Ref.		
Yes	1.03	0.938	0.50 2.12	3.25	0.004	1.47 7.20

\*Unadjusted relative risk ratio | CIs Confidence Intervals

Ref/Referent group

\*No intention is the base outcome

Intentions to Vaccinate Daughter*	Not Sure/Depends			Yes		
	aRRR <sup>b</sup>	p-value	95% CIs	aRRR <sup>b</sup>	p-value	95% CIs
HPV Knowledge						
No	Ref.			Ref.		
Yes	1.07	0.867	0.49 2.30	3.96	0.004	1.57 10.00

<sup>b</sup>Adjusted relative risk ratio | CIs Confidence Intervals

Ref/Referent group

\*No intention is the base outcome

Variables controlled for: gender, age, race/ethnicity, marital status, education, income, employment, and insurance

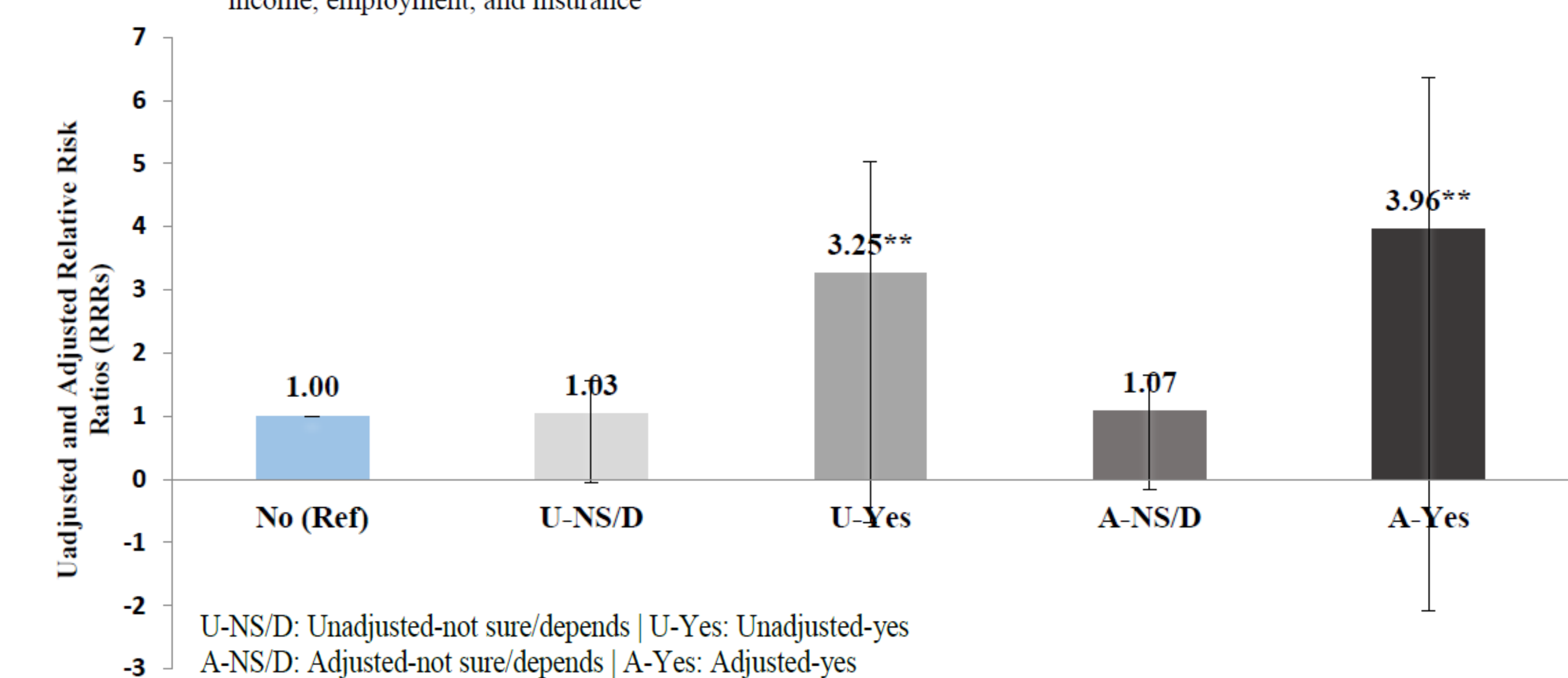


Figure 7. Unadjusted and adjusted relative risk ratios of HPV knowledge and intentions to vaccinate daughter, Health Information National Trends Survey (HINTS) 2007-2009

## Conclusions

- Overall, most parents were knowledgeable about HPV with over half (59.39%) of them having intentions to vaccinate daughters.
- However, parental intentions to vaccinate seems to have influence on daughters vaccination. Women who were HPV knowledgeable were *not sure* or *did not* have intentions to vaccinate their daughters (31.54%).
- However, being HPV knowledgeable point to be strongly associated with intentions to vaccinate daughters.
- Limitations
  - At the time that the HINTS 2007 data was collected, the HPV vaccine had just recently been approved and may have had an effects on participants' responses to the main outcome. However, while this may have an influence on participants' responses, the majority of them were knowledgeable about HPV.
  - The cross-sectional nature of the HINTS 2006-2007 data could not allow for causal inference between the outcomes and predictor variables.
- Healthcare providers should assess what parents know about HPV and vaccination during patient visits to identify knowledge deficits and address knowledge gaps.

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