



Published in final edited form as:

*J Health Commun.* 2010 ; 15(0 3): . doi:10.1080/10810730.2010.522695.

## Knowledge of HPV Among United States Hispanic Women: Opportunities and Challenges for Cancer Prevention

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### Abstract

In the United States, Hispanic women contribute disproportionately to cervical cancer incidence and mortality. This disparity, which primarily reflects lack of access to, and underutilization of, routine Pap smear screening may improve with increased availability of vaccines to prevent Human Papillomavirus (HPV) infection, the principal cause of cervical cancer. However, limited research has explored known determinants of HPV vaccine acceptability among Hispanic women. The current study examines two such determinants, HPV awareness and knowledge, using data from the 2007 Health Interview National Trends Survey (HINTS) and a cross-section of callers to the National Cancer Institute's (NCI) Cancer Information Service (CIS). Study data indicate that HPV awareness was high in both samples (69.5% and 63.8% had heard of the virus) but that knowledge of the virus and its association with cervical cancer varied between the two groups of women. The CIS sample, which was more impoverished and less acculturated than their HINTS counterparts, were less able to correctly identify that HPV causes cervical cancer (67.1% vs. 78.7%) and that it is a prevalent sexually transmitted infection (STI; 66.8% vs. 70.4%). Such findings imply that future research may benefit from disaggregating data collected with Hispanics to reflect important heterogeneity in this population subgroup's ancestries, levels of income,

educational attainment, and acculturation. Failing to do so may preclude opportunity to understand, as well as to attenuate, cancer disparity.

In the United States, Hispanic women experience an increased risk of developing and dying from cervical cancer (Barnholtz-Sloan et al., 2009; Canto, 2000; Carozza & Howe, 2006; McDougall et al., 2007). This disparity primarily reflects underutilization of regular Pap smear screening, the best method available for prevention and early detection of disease (McDougall et al., 2007). Hispanic women face multiple barriers to routinely accessing the formal healthcare system, particularly at the intervals recommended by cancer preventive guidelines (Cheong, 2007; Ku & Waidman, 2003; Rodriguez, Ward, & Perez-Stable, 2005). Thus, for this population subgroup, vaccination against Human Papillomavirus (HPV) infection, the principal cause of cervical cancer (Bosch et al., 2002; Franco, Rohan, & Villa, 1999; Pagliusi & Aguado, 2004; Scheurer, Tortolero-Luna & Adler-Storthz, 2005; Steben, & Duarte-Franceo, 2007; Walboomers et al., 1999), may offer an effective strategy for disease prevention (Centers for Disease Control and Prevention, 2007, 2009; Villa et al., 2005). A growing body of research has examined determinants of HPV vaccine acceptability within the population at large and, to a lesser extent, among Hispanic women (Bair et al., 2008; Brewer & Fazekas, 2007; Constantine & Jerman, 2007; Lazcano-Ponce et al., 2001; Zimet Liddon, Rosenthal, Lazcano-Ponce, & Allen, 2006). The current paper adds to this emergent area of inquiry by characterizing one specific determinant of acceptability, knowledge of HPV, in two national samples of Hispanics. Though knowledge alone does not determine disease risk, it is an important determinant of health behavior practice (Tiro, Meissner, Kobrin, & Chollette, 2007). Individuals who lack knowledge about HPV and its association with cancer may not understand the intrinsic value of preventing infection, and they may be less willing to be vaccinated or other participate in strategies for disease prevention (Brewer & Fazekas, 2007). Such knowledge may also vary between Hispanics of heterogeneous sociocultural and demographic backgrounds. Failing to account for this variability in future cancer prevention initiatives may limit their effectiveness to increase vaccine uptake and reduce the burden of disease.

## Materials and Methods

### Cancer Information Service Sample

Over the last decade, the National Cancer Institute (NCI), Cancer Information Service, Coastal Region (CIS) operated a Spanish language call center with a cadre of trained information specialists who provided cancer information and other phone-based support to approximately 4,000 callers annually. This service, which now operates out of the Fred Hutchinson Cancer Center, fills an important gap in meeting and also characterizing the cancer information needs of the growing U.S. Hispanic population. As part of usual service, information specialists would document the primary reason(s) for each call, as well as capture key demographic characteristics of individual callers using a standardized Electronic Contact Record Form (ECRF). Such characteristics included, but were not limited to caller's age, gender, level of educational attainment, annual family income, and health insurance coverage.

In early 2007, academic investigators from the University of Miami Sylvester Comprehensive Cancer Center, where the Spanish call center was then located, partnered with key CIS staff to collect additional data on HPV knowledge and vaccine acceptability. Between July 23, 2007, and March 31, 2008, CIS information specialists would provide usual service to callers, and then ask those who met study eligibility criteria whether they were willing to participate in a brief survey about cervical cancer. Callers were ineligible for

participation if they resided outside the United States, were emotionally distressed at the time of their call, or identified as a health professional and/or media.

Interested and eligible callers were consented to participate using a two-step process approved by the Institutional Review Board at the University of Miami Miller School of Medicine. The information specialist first read the consent script to the caller, and then asked whether they were still willing to participate. Those who verbally consented “yes” were then asked a series of questions about HPV and cervical cancer.

During the duration of study, there were 2,307 potentially eligible callers (male and female). Of these individuals, 2,134 actually met study eligibility criteria and were approached by the information specialist about participation. Nearly 60% of eligible persons (1,240) agreed to participate. For the purpose of the current study, we restricted our analyses to female participants who completed the entire interview ( $n = 836$ ).

On average, the interview took 10–15 minutes to complete and was conducted completely in Spanish. Where possible, survey items were derived from previously validated instruments and questionnaires. The HPV knowledge questions, in particular, were taken from the Health Information National Trends Survey (HINTS), conducted by the National Cancer Institute (NCI) on a biennial basis, with the intent of better understanding cancer information needs and experiences in the United States (Nelson et al., 2004).

### HINTS Sample

The HINTS is one of the few publically available datasets that includes questions about HPV knowledge. The HINTS 2007 used a mixed mode, dual-frame design for participant recruitment. One frame was a list-assisted, random digit dial (RDD) computer assisted telephone interview (CATI), wherein one adult from each household was selected for an interview. The second frame was a relatively comprehensive national listing of addresses available from the U.S. Postal Service (USPS) for the purpose of administering a mail survey. Both the RDD and mail survey were conducted from January through late April 2008. The overall response rate was 24.2% for the RDD household screener, and 40% for the mailed survey. Further details on the HINTS sample and sampling design are published elsewhere (NCI, 2009). For the current study, we restricted our analyses to the subsample of self-reported female Hispanic HINTS respondents ( $n = 375$ ). Despite obvious differences in methods of sampling and data collection between the two studies, the overlap in question content provides a unique opportunity to further understand HPV knowledge among U.S. Hispanics, and to potentially inform future intervention to improve vaccine uptake in this medically vulnerable population subgroup.

### Measures

**Primary Variables of Interest**—The HINTS and CIS respondents alike were first asked whether they had ever heard of HPV. Participants who responded “yes” to this question were then asked three additional questions about the virus and its association with cervical cancer. These questions assessed whether a woman could correctly identify that HPV: (1) causes cervical cancer; (2) is a sexually transmitted infection; STI and, 3) whether they had heard of the HPV vaccine known as Gardasil. For the purpose of analyses, we coded a “don’t know” response as conceptually equivalent to “no.” Neither data-set had significant missing data. When identified, missing data were excluded from analyses.

**Other Variables of Interest**—In addition to HPV knowledge, we also examined the demographic and sociocultural composition of the CIS and HINTS study samples. For both datasets, we collapsed continuous variables into categories typically using a median split to

facilitate comparison between the two samples. Variables of interest were limited by survey content. Demographic variables included the following: age (18–44, vs. 44 and older); annual family income (less than or equal to \$20,000, \$20,000 or more); educational attainment (less than high school graduate vs. high school degree or greater); health insurance coverage (yes vs. no); and overall health (excellent/good vs. fair/poor). Born in the United States (yes vs. no) was the only sociocultural variable included in the analyses.

### Data Analysis

For the CIS sample, analyses were conducted using SPSS version 16. The HINTS data were analyzed using SAS-callable SUDAAN Version 9.0, to account for the complex survey design and enable appropriate calculation of standard errors and 95% confidence intervals (CIs). For the HINTS analyses, we employed the jackknife variance estimation technique because it is compatible with the sample design and weighting procedures for HINTS. Frequencies for the variables of interest were generated independently for each study sample. Given the variability in the two studies' design and methods of data collection, we were unable to test whether observed differences between such variables were, in fact, statistically significant.

### Results

Table 1 characterizes the samples in terms of their demographic and sociocultural composition. Women in both samples ranged in age from 18 to 82 years. As shown in the table, the CIS sample tended to report a lower annual income and have completed fewer years of formal schooling. About half of the CIS sample (48.7%) had an annual family income less than \$20,000, and one-third (31%) did not graduate from high school, as compared to with 28% of the HINTS sample. The CIS sample tended to report poorer health (47% vs. 26.1%) and health insurance coverage (56.6% vs. 36.1%) than their HINTS counterparts. Only a nominal percentage (7.3%) of the CIS sample were born in the United States, as compared with more than half of (54.6%) HINTS respondents.

As seen in Table 1, awareness of HPV and Gardasil was slightly higher among CIS respondents than HINTS respondents (69.5% vs. 63.8%; 65.4% vs. 60.4%). However, CIS respondents were less able than their HINTS counterparts to identify HPV as a common STI (66.8% vs. 70.4%) and to consider HPV the principal cause of cervical cancer (67.1% vs. 78.7%; see Table 2).

### Discussion

Knowledge of HPV and Gardasil, the FDA-approved vaccine for HPV prevention, was high in both samples. This finding is perhaps not surprising, given that both HINTS and CIS respondents were interviewed almost immediately following a very extensive, bilingual direct to consumer marketing campaign for Gardasil. Though neither study explicitly measured participants' exposure to this campaign, other research has documented high recall for Gardasil ads and promotional materials within the population at large and among Hispanic women, specifically (Hughes et al., 2009). As the largest ethnic minority in the United States, Hispanic women were an important focus for the vaccine's marketing efforts. Gardasil sound-bites in Spanish were regularly and repeatedly run on television and radio stations, popular with the Hispanic demographic (Vanslyke et al., 2008).

Though such marketing efforts appear to have increased awareness of HPV generally, our data implies that the breadth of knowledge about the virus and its association with cervical cancer may vary between Hispanic population subgroups. In our study, CIS callers were less able than HINTS participants to correctly identify HPV as the principal cause of disease.

This difference, while untested, likely reflects observed variability in the two samples' socioeconomic position and levels of acculturation (Kobetz et al., 2010). The CIS participants were, on average, more impoverished and had lived fewer years in the United States than their HINTS counterparts. They also had collectively less access to the formal healthcare system, which may limit their exposure to health information and cancer health resources (Montano, 2002). Future research should further examine such differences, and potentially disaggregate data collected with Hispanics to reflect important heterogeneity in ancestry, acculturation, language preference, and social class. By grouping all Hispanic persons into a single category for research purposes, we limit our ability to understand the causes of health disparities, as well as appropriately target efforts for change.

In this vein, future research must characterize the individuals who still have never heard of HPV and focus intervention efforts accordingly. Approximately one-third of both HINTS and CIS respondents had never heard of HPV. This finding implies that current health promotion efforts, including the direct marketing of Gardasil, miss a significant segment of our population.

### Limitations

This study has a few notable limitations. The HINTS had a low overall response rate, and a proportionally small sample size of Hispanic women ( $n = 375$ ). The CIS dataset, in turn, relied upon a convenience sample of Hispanic information seekers, and, as a result, may not accurately represent how HPV awareness is distributed across the Hispanic population at large. Neither study was able to effectively disaggregate data by key demographic and sociocultural variables, such as country of origin and/or usual source of care. Both were cross-sectional in design, such that causal relationships among knowledge, awareness, and health behaviors can only be speculated. However, despite these limitations, study data offer important and unique insight to HPV knowledge among Hispanic American women.

### Conclusion

Perhaps most importantly, study data implicate potential key differences within the Hispanic population's knowledge of HPV, and argue for the need to disaggregate otherwise homogenized data to reflect existing variability in this and other outcomes of interest. There is tremendous heterogeneity within the U.S. Hispanic population, particularly with regard to country of origin, level of acculturation, socioeconomic position, and access to healthcare (Diaz, 2002; Ku & Waidman, 2003). Future research should explicitly examine and account for such diversity in an effort to better understand the causes of health disparity, as well as appropriately target efforts for change.

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**Table 1**

## Characteristics of study samples

	Percentage	
	<u>NCI CIS Hispanic female callers<sup>a</sup></u>	<u>United States Hispanic female respondents (weighted population estimates)<sup>b</sup></u>
	<i>n</i> = 836	<i>n</i> = 375
Sociodemographic background		
Age 18–44	65.9	70.4
Yearly income less than \$20,000	48.7	27.9
Less than high school graduate	31.0	27.3
No health care coverage	56.6	36.1
Born in the United States	7.3	54.6
10 years or less in United States	44.3	34.7
Health and HPV Knowledge		
Rate overall health as Fair/Poor	47.0	26.1
Have heard of HPV	69.5	63.8
Have heard of the HPV vaccine known as Gardasil	65.4	60.4

<sup>a</sup>Examining cultural and geographic variability in the cancer information needs of callers to the Cancer Information Service (CIS) Spanish-Language Call Center, 2008.

<sup>b</sup>National Cancer Institute, 2008 Health Information National Trends Survey (HINTS).



**Table 2**

Detailed knowledge of HPV among Hispanic women who had previously heard of the virus

	Percent correct responses	
	NCI CIS Hispanic female callers <sup>a</sup>	United States Hispanic female respondents (weighted population estimates)**
	<i>n</i> = 581	<i>n</i> = 236
Do you think that HPV...		
Causes cervical cancer?	67.1	78.7
Is a sexually transmitted infection?	66.8	70.4

*Note:* Women who responded “don’t know” were included as incorrect responses; women who refused were excluded from the analysis.

<sup>a</sup>Examining cultural and geographic variability in the cancer information needs of Callers to the Cancer Information Service (CIS) Spanish-language Call Center, 2008.

<sup>b</sup>National Cancer Institute, 2008 Health Information National Trends Survey (HINTS).