


## Contribution of communication inequalities to disparities in HPV vaccine awareness and infection knowledge

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### Presenter Disclosures

**Emily Z Kontos, ScD, ScM**

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No relationships to disclose


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### HPV

Major cause of cervical cancer in US

Disparities in cervical cancer incidence and mortality by race/ethnicity and SES

Black women in South, Hispanic women along border, white women in Appalachia, American Indians, Vietnamese and Alaskan native women have highest rates

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### HPV Vaccine


2006 FDA approved first vaccine for 4 main types of HPV; account for 70% of cervical cancer cases

Low vaccination uptake, even lower series completion rates as of 2008

• 37% of girls 13-17 yrs initiated the series  
 • 18% of teens completed the necessary 3 dose series<sup>1</sup>

Disparities in completion rates by race/ethnicity and SES

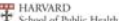
• Black and Hispanic girls more likely to initiate; less likely to complete compared to whites  
 • Girls living in poorer states, neighborhoods with low education levels and those who rely on public insurance less likely to complete series<sup>2,3</sup>

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### Structural Influence Model of Communication (SIM) to examine disparities

**SIM** identifies communication as link between distal social determinants and proximal health outcomes<sup>4</sup>

**Communication inequalities**- differences among social groups in *accessing, seeking, processing and using* health information- could explain disparities in health

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### Building upon Knowledge Gap


**Knowledge Gap Hypothesis** - increase of information in society is not evenly acquired

• people with higher SES have better ability to acquire information

Knowledge translates to behavior by shaping attitudes, beliefs and intentions

Exacerbation of knowledge gap- reliance on Merck's direct-to-consumer advertisements for vaccine education

• TV spots aimed at driving external searching to the **vaccine's website**<sup>5,6,7</sup>

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## Digital communication inequalities<sup>8</sup>

	Bivariate analyses		Multivariable analyses	
	% Internet user	$\chi^2$ p value	OR [95% CI]	Adjusted Wald p value
Total survey population (n=6,738)				
HH income				
<=20k	45	<.0001	1.00	<.0001
20-34k	54		1.40 [0.98; 1.99]	
35-49k	73		2.57 [1.77; 4.02]	
50-74k	81		3.43 [2.31; 5.09]	
>75k	91		4.83 [3.25; 7.19]	
Didn't report	62		1.93 [1.30; 2.89]	
Education				
<HS	28	<.0001	1.00	<.0001
HS	58		2.13 [1.56; 2.90]	
Some college	81		5.75 [4.23; 7.80]	
College	91		14.33 [9.85; 20.85]	
Race/ethnicity				
White, non-Hispanic	76	<.0001	1.00	<.0001
Black, non-Hispanic	59		0.52 [0.34; 0.80]	
Hispanic	50		0.47 [0.30; 0.73]	
Other	70		0.61 [0.41; 0.91]	

Also significant differences by age, sex, having a doctor, and immigrant status. Model included having children, health status, history of cancer, marital status, employment status and survey mode.

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## Research question

Are differences in **Internet-based health information seeking** associated with **disparities in HPV vaccine awareness and infection knowledge** among a representative sample of non-institutionalized US adults?

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## Methods (Data Source)

### NCI's Health Information National Trends Survey (HINTS) 2007

Data collected Jan-May 2008

Dual-frame sample:

RDD (n=4,092; RR=24%)

Mail (n=3,582; RR=31%)

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## Methods (Analysis)

Complete case analysis on combined sample

SAS v.9.2 in order to handle the complex sampling weights

Descriptive statistics, population-level estimates for independent and dependent variables

Independent associations between dimensions of Internet health information seeking and HPV vaccine awareness and infection knowledge

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## Independent Variables

Variable	Categorization
Internet use <small>"Do you ever go on-line to access the Internet or World Wide Web, or to send and receive email?"</small>	Non-user Internet user
General health information seeking <small>"Have you ever looked for information about health or medical topics from any source?" AND "The most recent time you looked for information about health or medical topics, where did you go first?"</small>	Non-seeker Non-Internet seeker Internet seeker
Cancer-specific health information seeking <small>"Have you ever looked for information about cancer from any source?" AND "The most recent time you looked for information about cancer, where did you go first?"</small>	Non-seeker Non-Internet seeker Internet seeker

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## Dependent Variables

Variable	Question
HPV vaccine awareness	"A vaccine to prevent HPV infection is available and is called the cervical cancer vaccine or HPV shot. Before today, have you ever heard of the cervical cancer vaccine or HPV shot?"
HPV infection knowledge (link with cervical cancer)	"Do you think HPV can cause cervical cancer?"
HPV infection knowledge (transmission)	"Do you think you can get HPV through sexual contact?"

Models controlled for: age, household income, education, race/ethnicity, employment status, sex, HPV status, having a daughter, immigrant status, insurance status, having a regular physician and general health status.

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## Results (Bivariate)

Awareness and knowledge higher among Internet users and Internet-based health information seekers	Aware of HPV vaccine		Knowledgeable HPV is a cause of cervical cancer		Knowledgeable HPV is contracted through sexual contact	
	%	$\chi^2$ p value	%	$\chi^2$ p value	%	$\chi^2$ p value
TOTAL	68%		75%		68%	
Internet Use	485.3	<.0001	45.37	<.0001	18.31	<.0001
Non-User	42		66		58	
User	75		81		70	
General Health Information Seeking	682.77	<.0001	93.72	<.0001	43.49	<.0001
Internet seeker	80		84		74	
Non-Internet Seeker	61		79		68	
Non-Seeker	46		64		50	
Cancer-Specific Health Information Seeking	193.47	<.0001	26.68	<.0001	29.21	<.0001
Internet seeker	82		84		75	
Non-Internet Seeker	71		80		73	
Non-Seeker	57		75		61	

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## Results (Multivariable)

	Aware of HPV vaccine n=6,853		Knowledgeable HPV is a cause of cervical cancer n=4,483		Knowledgeable HPV is contracted through sexual contact n=4,407	
	OR (95% CI)	Adjusted Wald p value	OR (95% CI)	Adjusted Wald p value	OR (95% CI)	Adjusted Wald p value
Internet Use	1.00	69.73	1.00	5.04	1.00	0.22
Non-User						
User	2.41 [1.96, 2.95]	<.0001	1.42 [1.05, 1.94]	0.02	0.93 [0.69, 1.26]	0.64
General Health Information Seeking						
Internet seeker	1.00	67.02	1.00	14.55	1.00	25.07
Non-Internet Seeker	0.59 [0.46, 0.75]	<.0001	0.79 [0.63, 0.99]	0.00	0.71 [0.57, 0.89]	<.0001
Non-Seeker	0.34 [0.27, 0.44]		0.55 [0.39, 0.76]		0.46 [0.34, 0.63]	
Cancer-Specific Health Information Seeking						
Internet seeker	1.00	44.47	1.00	20.22	1.00	17.55
Non-Internet Seeker	0.90 [0.68, 1.18]	<.0001	1.02 [0.73, 1.43]	<.0001	0.99 [0.70, 1.40]	0.00
Non-Seeker	0.49 [0.37, 0.63]		0.64 [0.48, 0.86]		0.61 [0.46, 0.80]	

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Internet users & general health Internet seekers more aware of vaccine and maintain general infection knowledge. Cancer-specific information seekers, regardless of source, more aware of vaccine and know about infection than non-seekers.

## Limitations & Implications

### Limitations

- Cross-sectional data; lack data on frequency of use and other media consumption variables

### Implications

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- Highlights importance of public communication and the **sources used for information delivery** in shaping the public's knowledge

2

- Strategy of using **channel such as Internet, which use is racially and socially patterned**, likely to exacerbate gaps in knowledge among vulnerable group

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- Need to **increase/improve off-line educational material** for vaccine

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## References & Acknowledgements

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