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National assessment of HPV and Pap tests: Changes in cervical cancer screening, National Health Interview Survey

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ABSTRACT

Background. Major organizations recommend cytology screening (Pap test) every 3 years for women aged 21–65; women aged 30 to 65 have the option of adding the HPV test (co-test) every 5 years. We examined national percentages of cervical cancer screening, and we examined use of co-testing as an option for screening.

Methods. We used 2015 U.S. National Health Interview Survey (NHIS) data to examine recent cervical cancer screening (Pap test within 3 years among women aged 21–65 without a hysterectomy; N = 10,596) and co-testing (N = 9,125). We also conducted a multivariable analysis to determine odds of having had a Pap test or co-test by demographic variables. To evaluate changes in screening over time, we examined Pap testing during the years 2000, 2005, 2008, 2010, 2013 and 2015. Analysis completed in Atlanta, GA during 2016.

Results. Overall, 81.1% of eligible women reported having a Pap test within 3 years; percentages declined over time among all age groups. An estimated 14 million women aged 21–65 had not been screened within the past 3 years. Recent immigrants to the United States, women without insurance, and women without a usual source of healthcare had lower odds of being up to date with screening. About 1/3 of women up to date on Pap testing reported having a co-test with their most recent Pap test.

Conclusions. Declines in screening among women aged 21–65 are cause for concern. More research is needed on co-testing practices. Provider and patient education efforts may be needed to clarify recommended use of HPV tests.

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1. Introduction

In the United States, cervical cancer screening has proven to be extremely successful, resulting in declining incidence and mortality rates, although recent statistics suggest declines in mortality have stabilized (Ryerson et al., 2016; Saraiya et al., 2013; Benard et al., 2014). In 2012, major organizations that issue guidelines on cervical cancer screening recommended cytology screening (Pap test) every 3 years for women aged 21–65; women aged 30 to 65 have the option of adding the HPV test (co-test) every 5 years (Centers for Disease Control and Prevention, 2013).

Healthy People provides national objectives for improving the health of all Americans. The Healthy People 2020 (HP2020) cervical cancer objective is to increase the proportion of women aged 21–65 who receive a screening based on the most recent guidelines to 93% (Healthy People 2020, 2016). Analyses of national data from 2013 showed that the percentage of recommended screening (every 3 years among women aged 21–65) had not yet attained this objective, and in fact were declining (Sabatino et al., 2015).

The purpose of this study was to examine the most recent national survey data (2015) on cervical cancer screening in accordance with current recommendations to assess progress toward HP2020 objectives, and to examine national data on the use of co-testing as an option for screening.

2. Methods

We used data from the 2015 U.S. National Health Interview Survey (NHIS) to examine recent cervical cancer screening. NHIS is a cross-sectional household survey conducted in person in English or Spanish and representative of the civilian, noninstitutionalized US population (National Center for Health Statistics, Centers for Disease Control and Prevention, 2016a). One sample adult aged ≥18 years and sample child (if present) in each family are randomly selected for additional detailed questions. We used the Sample Adult file, which had a response rate of 55.2% for 2015 (National Center for Health Statistics, Centers for Disease Control and Prevention, 2016b). We also used the Person and Imputed Income files for additional information. The overall

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proportions of persons screened were presented as crude percentages and age standardized to the 2000 U.S. standard population.

We considered having had a Papanicolaou (Pap) test within 3 years as being up to date with screening. Women age 18 + who reported ever having had a Pap test were asked the NHIS question: *When did you have your MOST RECENT Pap test?* In order to assess information on co-testing, these women were also asked: *An HPV test is sometimes given with the Pap test for cervical cancer screening. Did you have an HPV test with your most recent Pap test?* We limited our analysis to women recommended for screening: age 21–65 years, not having had a hysterectomy.

We examined screening by race/ethnicity (white, black, and Asian [all non-Hispanic], and Hispanic [regardless of race]), age group, U.S. residence, education level, family income (% of federal poverty threshold), usual source of health care, and health care insurance coverage. Insurance includes public or private health care coverage, but excludes Indian Health Service coverage or single service plans (i.e., that pay for only one type of service). We also examined the odds ratios of these variables in a multivariate analysis, to determine which of these factors may be most strongly associated with cervical cancer screening. NHIS data from 2000, 2005, 2008, 2010, 2013, and 2015 were used to evaluate changes in cervical cancer screening percentages over time. We used two test timing recodes for NHIS data, depending on the year or years analyzed. Timing recode "A" was used for 2015 data (NHIS variable RPAP3A1) (National Center for Health Statistics, Centers for Disease Control and Prevention, 2016a). This recode is available for 2005 and forward data, and provides the most accurate estimates. The timing recode "B", used for 2000–2015 trends, uses the year 2000 estimation method and assumptions for missing data (NHIS variable RPAP3B1). The "B" version results in slightly biased screening estimates, but allows for unbiased comparisons with the 2000 and 2003 data.

We used SAS-callable SUDAAN Version 9.3 for statistical analysis. Differences in demographic variables were considered statistically significant if 95% confidence intervals did not overlap. Percent change was calculated as the percentage receiving screening in 2015 subtracted from the percentage screened in 2000, divided by the percentage screened in 2000. Pearson Wald F tests were used to test for differences in rates across years. All statistics were weighted to account for unequal probability of selection and nonresponse.

3. Results

Overall, 81.1% of women aged 21–65 reported having a Pap test within 3 years, in accordance with recommendations (Table 1). Non-Hispanic Asian and Hispanic women had lower percentages of Pap test within 3 years (73.5% and 76.9, respectively) than non-Hispanic white and non-Hispanic black women (82.6% and 84.5%, respectively). Only 66.8% of women in the United States < 10 years reported a recent screening, compared to 77.0% of those in the united States > 10 years and 82.8% of US = born women. About 1/3 of women up to date on Pap testing reported having a co-test at their most recent screening. Co-testing percentages were highest among non-Hispanic black women and lowest among non-Hispanic Asian women (35.2% and

Table 1
Pap testing[a] and co-testing[b] within 3 years by demographic variables, United States, 2015.

	Pap test within 3 years			Co-test (Pap + HPV) within 3 years		
	N	%	95% CI	N	%	95% CI
Overall (*crude*) AGE 21–65 ONLY	10,596	81.1	(80.1, 82.1)	9125	32.0	(30.6, 33.4)
Overall (*age-adjusted to 2000 U.S. Standard Population*)	10,596	81.4	(80.4, 82.4)	9125	31.9	(30.5, 33.3)
Race						
Hispanic	2121	76.9	(74.4, 79.2)	1861	30.5	(27.6, 33.6)
Non-Hispanic White	6062	82.6	(81.3, 83.8)	5174	33.0	(31.1, 34.9)
Non-Hispanic Black	1579	84.5	(82.1, 86.6)	1372	35.2	(31.9, 38.6)
Non-Hispanic Asian	684	73.5	(69.3, 77.3)	598	21.4	(17.5, 25.8)
Non-Hispanic Other	150	69.7	(55.8, 80.8)	120	27.5	(18.1, 39.4)
Age in years						
21–29	2281	76.7	(74.1, 79.1)	2066	38.2	(35.4, 41.0)
30–39	2737	86.1	(84.3, 87.7)	2384	41.0	(38.2, 43.8)
40–49	2246	81.9	(79.6, 84.1)	1928	29.8	(27.1, 32.8)
50–65	3332	79.8	(78.1, 81.4)	2747	20.3	(18.1, 22.8)
Period of U.S. residence						
US-born	8320	82.8	(81.6, 83.9)	7153	34.2	(32.6, 35.8)
In United States <10 years	470	66.8	(61.7, 71.5)	409	21.3	(16.7, 26.9)
In United States ≥10 years	1783	77.0	(74.3, 79.5)	1545	24.2	(21.3, 27.3)
Education						
Less than high school	1230	69.5	(65.9, 72.9)	1068	20.8	(17.6, 24.3)
High school graduate	2161	74.7	(72.0, 77.2)	1889	26.7	(23.7, 29.9)
Some college/associate degree	3480	81.2	(79.2, 83.1)	3010	33.3	(31.0, 35.7)
College graduate	3698	87.8	(86.5, 89.1)	3132	37.0	(34.8, 39.4)
% of federal poverty threshold						
<139%	2999	73.5	(71.2, 75.7)	2627	26.6	(24.1, 29.2)
139%–250%	2100	76.4	(73.7, 78.9)	1844	29.4	(26.7, 32.2)
251%–400%	1983	80.6	(78.2, 82.8)	1703	31.8	(29.0, 34.6)
>400%	3514	87.9	(86.4, 89.3)	2951	36.6	(34.3, 39.0)
Usual source of care						
None or hospital emergency department	702	74.2	(69.4, 78.5)	618	33.6	(28.4, 39.2)
Has usual source	8483	84.5	(83.5, 85.4)	7225	32.7	(31.2, 34.3)
Health care coverage						
Private	6708	85.3	(84.1, 86.3)	5790	34.5	(32.8, 36.3)
Medicaid and other public	1852	77.9	(75.1, 80.5)	1614	29.9	(26.6, 33.5)
Other coverage	472	83.5	(78.6, 87.5)	408	33.9	(28.5, 39.7)
Uninsured	1334	61.2	(57.7, 64.6)	1212	21.4	(18.4, 24.8)

Abbreviations: CI = confidence interval; Pap = Papanicolaou.
NHIS question for Pap test: When did you have your MOST RECENT Pap test?
NHIS question for HPV test: An HPV test is sometimes given with the Pap test for cervical cancer screening. Did you have an HPV test with your most recent Pap test?
Data analysis completed in Atlanta, GA during 2016.
[a] Percentages expressed are weighted. Overall percentages presented as crude and age–adjusted estimates. Other percentages are crude estimates.
[b] Percentages for co-testing are calculated as a subset of those who reported their most recent Pap test within 3 years.