Cervical Cancer Screening Among Women by Birthplace and Percent of Lifetime Living in the United States

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Abstract

Objective: The aim of the study was to provide national estimates of Pap test receipt, by birthplace, and percent of lifetime in the United States (US).

Materials and Methods: Pooled nationally representative data (2005, 2008, 2013, 2015) from the National Health Interview Survey were used to examine differences in Pap test receipt among adult US women by birthplace and percent of lifetime in the US. Descriptive estimates were age-adjusted. Regression models were adjusted for selected sociodemographic and healthcare access and utilization factors and presented as predicted margins.

Results: Foreign-born women 18 years and older were more than twice as likely to have never received a Pap test compared with US-born women(18.6% vs 6.8%). Regression models showed that foreign-born women from Mexico (9.8%), South America (12.6%), Caribbean (14.6%), Southeast Asia (13.7%), Central Asia (20.4%), South Asia (22.9%), Middle East (25.0%), Africa (27.8%), Europe (16.4%), and Former Soviet Union (28.2%) were more likely to be unscreened compared with US-born women (7.6%). Foreign-born women who spent less than 25% of their life in the US had higher prevalence of never having a Pap test (20%) compared with foreign-born who spent more than 25% of their life in the US (12.7%).

Conclusions: Using national survey, we found that where a woman is born and the percent of her lifetime spent residing in the US do impact whether she gets screened at least once in her lifetime.

Impact: These findings may inform cervical cancer screening efforts targeting foreign-born women.

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Keywords

papanicolau; cancer screening; foreign born; immigrants; birthplace

Globally, cervical cancer is the fourth most common cancer in women and the seventh most common among all cancers overall, with an estimated 528,000 new cases in 2012.[1] The Pap smear (Pap test) is a screening method used to detect potentially precancerous and cancerous processes in the cervix (opening of the uterus or womb). Since the introduction and widespread use of the Pap test in the 1950s, cervical cancer incidence and mortality rates in the United States (US) have decreased by more than 70%.[2] Still, 11% of US women aged 21 to 65 years have never been screened for cervical cancer.[3] From 1995 to 2000, more than half of all new cervical cancer cases occurred among women who were rarely or never screened.[4] Cervical cancer incidence rates are higher among foreign-born women living in the US compared with US-born women,[5] yet foreign-born women are less likely to receive cervical cancer screening compared with US-born women.[6] This disparity is partially attributed to birthplace, race, and social disparities.[6–8]

Thirteen percent of the US population is foreign-born, and this proportion is expected to grow to 20% in the next 40 years.[9,10] With high cervical cancer incidence rates among this subgroup, and foreign-born females constituting 51% of the foreign-born population,[9] it is important to understand the cervical cancer screening disparities these women face. This article uses periodic cancer supplements for recent years from the National Health Interview Survey (NHIS) to gain a better understanding of the use of Pap tests for cervical cancer screening in the US. We examine lifetime receipt of a Pap test for all women 18 years and older and adherence to US Preventive Services Task Force (USPSTF) recommendations for cervical cancer screening for women aged 21 to 65 years[11] by birthplace and percent of lifetime spent in the US.

MATERIALS AND METHODS

Data Source

The NHIS is a multipurpose, cross-sectional health survey of the US civilian noninstitutionalized population based on a stratified multistage sampling design of households and group quarters (e.g., college dormitories).[12] The NHIS data are publicly available with some exceptions; some demographic characteristics and geographic variables such as country of birth must be accessed through the National Center for Health Statistics (NCHS) Research Data Centers. The NHIS does not collect data on immigration status.

Combined 2005, 2008, 2010, 2013, and 2015 NHIS data were used for this report. We examined lifetime receipt of a Pap test among women aged 18 years and older without a history of hysterectomy ($n = 62,333$). Worldwide differences in recommended age of first Pap test precluded use of other age ranges. We further examined adherence to the USPSTF recommendations for cervical cancer screening in women aged 21 to 65 years without a history of hysterectomy ($n = 49,233$). The USPSTF recommends screening for cervical cancer every 3 years with cervical cytology (Pap test) alone in women ages 21 to 29 years

and either screening every 3 years with Pap test alone or every 5 years with high-risk human papillomavirus (HPV) testing alone in women ages 30 to 65 years.[11] The use of high-risk HPV was not included in analyses because HPV screening data were not available on the NHIS for all years used for this analysis.

Study Variables

Women born in the US, a US territory or born abroad to a US citizen, were categorized as US-born, and all others were considered foreign-born. Among foreign-born women, birthplace was categorized using a modification of NHIS' geographic region variable. Mexico, Central America, and the Caribbean were separated because of the larger number of immigrants relative to those from the other regions (South America, Southeast Asia, Central Asia, South Asia [Indian Subcontinent], Middle East [Western Asia], Africa, The Former Soviet Union [FSU], and Europe [excludes FSU]) included in the study. Because of small sample sizes and representation in the overall study population (<1% of study population), we assigned foreign-born women from all other regions/countries not listed, to the "Elsewhere" category. However, the diverse sociodemographic, economic, and varied geographies preclude this category from comparison as a uniformed statistical unit for the purposes of this report.

Percent of lifetime living in the US is commonly used as a proxy measure for acculturation. Similar to Tsui et al.,[6] we calculated percent of lifetime in the US by dividing the number of years living in the US by age at interview and then dichotomized into less than 25% and 25% or more. Lifetime Pap test receipt was determined by a "yes/no" response to the question "Have you ever had a Pap smear or Pap test?" Women who responded "no" were categorized as never screened. Those who responded "yes" were asked "When did you have your most recent Pap test?" Age at interview and response to time of most recent Pap test were used to calculate the percentage of women who did not meet the USPSTF recommendations for cervical cancer screening with Pap test alone.

Demographic characteristics presented in this report include age, ethnicity, race, highest level of education, poverty status, birthplace, and percent of lifetime in the US. Selected health, healthcare access, and utilization variables include health status, health insurance coverage at the time of interview, usual place of medical care, and number of doctors' visits in the past 12 months. Using the imputed income files, poverty status was calculated from poverty thresholds predefined by the US Census Bureau using a specific ratio of income as a percentage of the poverty threshold. Health insurance was categorized into 3 mutually exclusive categories; persons with more than 1 type of health insurance were assigned to their primary insurance category in the following hierarchy: private then public. Uninsured included persons who had no coverage as well as those who had only Indian Health Service coverage or had only a private plan that paid for 1 type of service such as accidents or dental care.

Statistical Analyses

Estimates were calculated using the sample adult sampling weights (adjusted for the number of survey years combined in the analysis) and are representative of the civilian,

noninstitutionalized population of US women 18 years and older and 21 to 65 years. Unless otherwise indicated, estimates were age-adjusted using the 2000 projected US population.[13] Detailed population tables are available from the US Census Bureau. Respondents with missing information on healthcare utilization, Pap test receipt (5.6%), birthplace (0.1%), and other sociodemographic factors were excluded from the relevant analysis. Point estimates and estimates of their variances were calculated using SAS-callable SUDAAN Version 11.0.0 (RTI International, 2013, Durham, NC), a software package that accounts for the complex sample design of NHIS. Estimates were compared using two-sided *t* tests at the 0.05 level and assuming independence.

Prevalence estimates for Pap test receipt by birthplace were adjusted for selected socioeconomic and health care access and utilization factors, and these were presented as predicted margins from logistic regression models. The predictive margin for a given group is the average predicted value for a population. Comparisons of Pap test receipt by birthplace and percent of lifetime in the US were made as though women in those population subgroups had the same sociodemographic characteristics, health status, and selected indicators of health care access and utilization. Thus, resulting estimates reflect differences by birthplace and length of lifetime in the US only. Statistical comparisons of the differences between estimated differences of lifetime Pap test receipt and receipt in the past 3 years between selected subpopulations compared with US-born women were also made. Age-adjusted estimates in associated tables may differ from other age-adjusted estimates based on the same data presented elsewhere if different age groups were used in the adjustment procedure.

RESULTS

Sociodemographic Characteristics

Foreign-born women represented 16.7% of the study population (see Table 1). Women born in Mexico (28.7%), Central and South American countries and the Caribbean (23.4%), and Asian countries (27.9%) accounted for most foreign-born women. Nearly half of the foreign-born participants identified as Hispanic, whereas 3 quarters of the US-born women identified as non-Hispanic white. A larger percentage of foreign-born women (30.7%) had less than high school education compared with US-born women (10.2%). Preliminary analyses indicated differences in educational attainment by region of birth among foreign-born women (data not shown). Compared with their US-born counterparts, foreign-born women were more likely to not have health insurance (27.4% vs 11.7%), a usual place of care (19.9% vs 11.2%), and reported no visits to a healthcare provider within the past 12 months (21.7% vs 12.0%). Most foreign-born women (72.9%) had spent 25% or more of their life in the US.

Pap Test Screening

Estimates Adjusted for Age Only.—Foreign-born women were more than twice as likely to have never received a Pap test (18.6% vs 6.8%) as US-born women (see Table 2). Among foreign-born women, those who spent less than 25% of their life in the US were more likely to be unscreened compared with those who spent 25% or more of their life in the

US (25.3% vs 16.3%). For each sociodemographic characteristic examined, foreign-born women were more likely to have never received a Pap test compared with US-born women. Differences in Pap test receipt also existed by region of birth and percent of lifetime in the US (see Figure 1).

Estimates Adjusted for Sociodemographic Characteristics, Health Status, and Health Care Access and Utilization.—The relationship between place of birth and never receiving a Pap test is attenuated but remains significant for most regions when adjusting for selected sociodemographic and healthcare access and utilization characteristics (see Figure 1, Table 3). Among women aged 18 years and older, foreign-born women who had spent less than 25% of their lifetime in the US were more than twice as likely be unscreened (20.0%) compared with US-born women (7.6%) (see Table 3). Foreign-born women who had spent 25% or more of their lifetime in the US (12.7%) were also more likely to be unscreened compared with US-born women. Women from Mexico (9.8%), South America (12.6%), the Caribbean (14.6%), and Southeast Asia (13.1%) were more likely to never have a Pap test compared with US-born women. Women born in Europe (16.4%) and Central Asia (20.4%) were more than twice as likely as their US-born peers to never have a Pap test, whereas those born in FSU (28.2%), Africa (27.8%), Middle East (25.0%), and South Asia (22.9%) were more than 3 times as likely to be unscreened. There was no significant difference in never having a Pap test between women born in Central America (8.9%) and US-born women. Note that preliminary analysis (not shown) showed no interaction between survey year and foreign-born status for lifetime Pap receipt ($p = .23$) or recommended screening ($p = .38$).

Even after adjusting for sociodemographic and health care access and utilization characteristics, among women aged 21 and 65 years; foreign-born women who spent less than 25% of their lifetime in the US and those who spent 25% or more of their lifetime in the US were more likely to not have a Pap test in the past 3 years (26.2% and 21.2%, respectively) compared with US-born women (18.9%) (see Table 3). Women from the Caribbean (23.3%), Europe (24.9%), FSU (42.8%), Africa (36.8%), Middle East (35.1%), Central Asia (28.7%), and South Asia (33.5%) were more likely to not have a Pap test in the past 3 years compared US-born women. Conversely, women from Mexico (15.8%) and Central America (15.5%) were less likely to not have a Pap test in the past 3 years compared with US-born women. There was no significant difference between US-born women and foreign-born women from South America (18.8%) and South East Asia (19.3%) in meeting recommended USPSTF cervical cancer screening guidelines.

DISCUSSION

Health disparities between foreign- and US-born persons are often attributed to socioeconomic differences and dissimilarities in healthcare access and utilization.[5,7] In this study, even after controlling for those factors, foreign-born women from most regions examined were more likely to have never received a Pap test compared with US-born women. With regard to meeting the USPSTF cervical cancer screening recommendation, foreign-born women from most regions, with the exception of Mexico, Central and South America, and Southeast Asia, were more likely to not have had a Pap test in the past 3 years

compared with US-born women. The proportion of women who had never received a Pap test as well as those who had not been screened in the past 3 years was greater for foreign-born women who spent less than 25% than those who spent more than 25% of their lifetime in US and was also greater for women who spent more than 25% of their lifetime in comparison with US-born women.

Tsui et al.[6] published a study in 2007 using NHIS data from 2003 and earlier and conducted analyses that closely paralleled the current study, where they divided foreign-born women based on birthplace as well as percent of time in the US and adjusted for sociodemographic and health care utilization factors. Tsui et al.[6] reported that foreign-born women were more likely to never have a Pap test compared with US-born women, regardless of birthplace and percent of time in the US. They also found that differences in Pap test screening rates in the past 3 years, between foreign-born and US-born women, were similar to those seen for women who never received a Pap test.

Contrary to Tsui et al.,[6] we found no significant difference between US-born women and foreign-born women from Central America with regard to lifetime Pap test receipt. Contrary to Tsui et al.,[6] when examining the percentage of women who did not meet USPSTF recommendations for cervical cancer screening, we found that women from Mexico, Central and South America, and Southeast Asia were more likely or as likely as US-born women to have received a Pap test in the past 3 years. This could suggest that in more recent years, the likelihood of getting a Pap test in the past 3 years among foreign-born women from these countries has increased.

Some of our findings are also consistent with studies conducted outside of the US. Researchers in Canada and Norway have shown that foreign-born women were more likely to have never received cervical cancer screening compared with native-born women.[14,15] The likelihood of screening for foreign-born women also varied by percentage of lifetime in their host country.[14,15] In addition, the Norway study found variations in cervical cancer screening coverage based on birthplace for some immigrant groups.[15]

Researchers have provided some explanations for the cervical cancer screening disparity observed in foreign-born women. Documented barriers to screening among foreign-born women include language, lack of knowledge about preventive care and safety net programs, misconceptions about screening and the cause of cervical cancer, fear, embarrassment, previous negative experiences, lack of time, and financial concerns related to missing work.[16–20] Some barriers such as language, lack of knowledge of cervical cancer prevention and cause, as well as characteristics tied to culture may be more pronounced in women who have spent a smaller percentage of their lifetime in the host country.[21] The use and incorporation of the Pap test into population-based cervical cancer screening programs have not been fully realized in many parts of the world.[22] Improvement in or stagnation in availability of national cervical cancer prevention and control programs using the Pap test or other screening modalities in country of origin may influence observed differences based on birthplace.[23,24]

In the US, Hispanics account for the largest group of immigrants. Therefore, verbal and written translation for health-related materials are more common for the Spanish language.[25] Consequently, Hispanic women have access to more targeted health services and cervical cancer screening programs with culturally appropriate bilingual information.[26] This may further explain differences in Pap test receipt among foreign-born women from Mexico, South America, and Central America compared with foreign-born women from non-Spanish speaking countries.

Systematic reviews have found that culturally appropriate, targeted interventions are effective at increasing cancer screening rates.[27,28] Common elements among these interventions include using language-based disease specific materials, involving patient navigators, providing cultural awareness training for health care providers, and removing barriers to screening. Research is underway for novel ideals such as providing self-sampling test kits to make screening convenient for people, including foreign-born persons.[29] Further research could examine barriers to interventions to increase cervical cancer screening among the foreign-born population.

The NHIS is a cross-sectional survey where current and historical information are collected at 1 point in time. Data are based on self-report, which may be limited by respondents' willingness to provide information, inaccuracy in recall, inflating self-assessment, question comprehension, and cultural differences.[30] To increase the precision of estimates of Pap test receipt at detailed levels, we combined data from 5 periodic cancer supplements spanning 11 years. Although there are significant reductions in sampling errors by combining data across years, there are also limitations associated with this estimation procedure in that it only provides an average across the years and does not represent a particular point in time. However, preliminary analyses using Joinpoint (National Cancer Institute, 2017, Bethesda, MD) software showed that there was no significant trend in ever having a Pap test across the survey years within the study. A major strength of these analyses is that the data are from a nationally representative sample of US women, thus allowing for population estimates. The large sample size allows for estimation of receipt of a Pap test by several population subgroups and other self-reported health characteristics collected in NHIS.

CONCLUSIONS

Where a woman is born and the percent of her lifetime residing in the US may play a role in whether she receives a Pap test at least once in her lifetime and if she is likely to be screened regularly. Foreign-born women have a higher incidence of cervical cancer[5] yet are less likely to receive a Pap test compared with US-born women. These findings may inform cervical cancer screening efforts targeting foreign-born women.
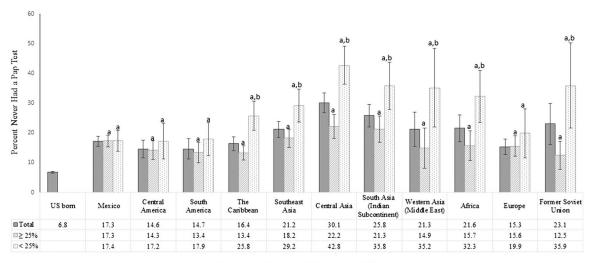
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FIGURE 1.
Age-adjusted estimates of never having a Pap test by birthplace and percent of lifetime in the United States, women 18 years or older: National Health Interview Survey 2005, 2008, 2010, 2013, and 2015. Note: The denominator used for analysis is US women 18 years or older, who never had a hysterectomy. Percents shown are age adjusted using the projected 2000 US population as the standard population and using the following age groups: 18–20, 21–29, 30–39, 40–49, 50–59, 60–64, and 65 years. Percents were weighted using the sample adult weight adjusted for 5 years of data. Birthplace is mutually exclusive. [a]Significantly different from US-born ($p < .05$). [b]Significantly different from 25% of lifetime in the United States ($p < .05$).

TABLE 1.

Age-Adjusted Demographic and Healthcare Access Characteristics of Women 18 y and Older, by Birthplace: NHIS 2005, 2008, 2010, 2013, and 2015

Characteristics	Foreign-born women			US-born women		
	Sample size, n	Distribution, %	Standard error	Sample size, n	Distribution, %	Standard error
All women [a]	11,791	16.7%		50,542	83.3%	
Age, y [b]						
18–20	300	3.5%	0.26	2,275	6.8%	0.19
21–29	1,957	17.2%	0.52	9,441	20.2%	0.27
30–39	3,201	25.6%	0.51	10,017	19.0%	0.22
40–49	2,491	22.4%	0.51	8,780	18.3%	0.23
50–59	1,599	14.8%	0.45	7,870	16.0%	0.21
60–64	573	4.9%	0.25	3,304	6.0%	0.13
65+	1,670	11.6%	0.38	8,855	13.8%	0.22
Race/ethnicity [b]						
Hispanic [c]	6,475	46.2%	1.00	5,512	8.0%	0.24
Non-Hispanic white	1,605	20.5%	0.71	34,254	75.5%	0.40
Non-Hispanic black	923	7.9%	0.48	8,681	12.8%	0.31
Non-Hispanic Asian	2,718	24.8%	0.77	815	1.4%	0.13
Marital status [b]						
Never married	2,010	15.9%	0.39	13,148	21.5%	0.22
Currently married/living with a partner	6,908	65.3%	0.55	23,034	57.8%	0.30
Formerly married	2,834	18.8%	0.40	14,213	20.7%	0.21
Current US region of residency						
Northeast	2,160	20.8%	1.11	8,793	18.7%	1.11
Midwest [b]	1,191	11.2%	0.97	12,120	25.4%	0.84
South [b]	3,742	30.6%	1.52	18,454	36.2%	0.86
West [b]	4,698	37.4%	1.97	11,175	19.7%	0.81
Education [b]						
Less than High School	4,027	30.7%	0.76	5,695	10.2%	0.19

Characteristics	Foreign-born women			US-born women		
	Sample size, *n*	Distribution, %	Standard error	Sample size, *n*	Distribution, %	Standard error
High School graduate/GED[d]	2,432	21.8%	0.55	12,901	25.7%	0.30
Some college	2,248	19.8%	0.52	17,009	33.6%	0.29
College Degree	2,952	27.7%	0.68	14,763	30.5%	0.35
Family income[b,e]						
<100% of poverty level	3,250	21.9%	0.59	8,876	12.7%	0.24
100%–199% of poverty level	3,171	25.2%	0.59	10,272	18.1%	0.26
200%–399% of poverty level	2,932	27.6%	0.72	14,947	30.3%	0.30
400% of poverty level	2,438	25.3%	0.67	16,447	39.0%	0.44
Health status[b]						
Excellent/very good	6,597	57.1%	0.66	30,906	63.4%	0.32
Good	3,570	29.5%	0.56	13,154	25.3%	0.25
Fair/poor	1,619	13.5%	0.44	6,458	11.4%	0.19
Insurance[b] (at time of interview)						
None	3,615	27.4%	0.64	6,267	11.7%	0.22
Private	5,100	47.6%	0.78	32,243	68.3%	0.37
Public	3,029	25.0%	0.54	11,879	20.1%	0.28
Usual place of care						
None[b]	2,547	19.9%	0.51	5,990	11.2%	0.22
Clinic or health center[b]	3,206	23.9%	0.66	10,029	17.0%	0.41
Doctor's office or HMO[b]	5,611	53.9%	0.80	33,360	70.3%	0.44
Hospital outpatient[b]	227	1.6%	0.15	485	0.8%	0.06
Other place	85	0.8%	0.13	423	0.8%	0.05
Visits to health provider[b] (in past 12 mo)						
None	2,741	21.7%	0.53	6,256	12.0%	0.21
1	2,203	18.9%	0.51	7,744	15.2%	0.23
2–3	3,008	26.0%	0.54	14,014	28.1%	0.27
4	3,800	33.4%	0.58	22,336	44.7%	0.33

Characteristics	Foreign-born women			US-born women		
	Sample size, *n*	Distribution, %	Standard error	Sample size, *n*	Distribution, %	Standard error
Ever had a Pap test[b]						
Yes	9,677	81.4%	0.47	47,107	93.2%	0.15
No	1,976	18.6%	0.47	3,225	6.8%	0.15
Country of birth						
Mexico	3,952	28.7%	1.04	NA	NA	NA
Central America	964	6.7%	0.34	NA	NA	NA
South America	844	6.8%	0.38	NA	NA	NA
Caribbean Islands	1,354	9.9%	0.78	NA	NA	NA
Southeast Asia	1,210	10.8%	0.48	NA	NA	NA
Central Asia	909	8.0%	0.41	NA	NA	NA
South Asia (Indian Subcontinent)	579	6.1%	0.35	NA	NA	NA
Middle East	197	3.0%	0.33	NA	NA	NA
Africa	429	4.0%	0.28	NA	NA	NA
Europe	878	11.0%	0.58	NA	NA	NA
FSU	193	2.5%	0.27	NA	NA	NA
Lifetime in US				NA	NA	NA
<25%	3,232	27.1%	0.58	NA	NA	NA
25%	8,534	72.9%	0.58	NA	NA	NA

Estimates are based on household interviews of a sample of the civilian noninstitutionalized population. Estimates were weighted using the sample adult weight adjusted for 5 y of data. Unless indicated, unknowns for the columns were not included in the denominators when calculating percentages, but they were included in the "All Women" row. Percentages may not add to totals because of rounding. Estimates are age-adjusted (except age-specific results) using the projected 2000 US population as the standard population and using age groups: 18–20, 21–29, 30–39, 40–49, 50–59, 60–64, and 65 y and older.

Adapted from NCHS, National Health Interview Survey (NHIS) Sample Adult Cancer Supplements 2005, 2008, 2010, 2013, and 2015.

[a]US women 18 y and older, who never had a hysterectomy.

[b]Significantly different by foreign-born vs US-born status ($p < .05$).

[c]Hispanic refers to persons who are of Hispanic or Latino origin and may be of any race or combination of races.

[d]GED is general educational development high school equivalency diploma.

[e]Based on family income and family size using the US Census Bureau poverty thresholds for 2004, 2007, 2009, 2012, and 2014.

FSU indicates Former Soviet Union; GED, general educational development; HMO, Health Maintenance Organization; NA, not applicable; US, United States.

TABLE 2.

Age-Adjusted Prevalence of Women 18 y and Older Who Never Had a Pap Test, by Birthplace: NHIS 2005, 2008, 2010, 2013, and 2015

Characteristics	Foreign-born women			US-born women		
	Sample size, *n*	Never screened, %	Standard error	Sample size, *n*	Never screened, %	Standard error
Total never screened[a,b]	1,976	18.6%	0.47	3,225	6.8%	0.15
Age, y[b]						
18–20	202	74.2%	3.14	1,024	47.3%	1.37
21–29	526	28.4%	1.38	925	10.8%	0.48
30–39	437	12.9%	0.74	248	2.4%	0.19
40–49	277	10.0%	0.74	210	2.1%	0.19
50–59	176	10.5%	1.03	160	1.5%	0.15
60–64	64	11.1%	1.54	89	2.3%	0.31
65+	294	17.1%	1.14	569	6.0%	0.34
Race/ethnicity[b]						
Hispanic[c]	946	16.7%	0.66	614	10.1%	0.56
Non-Hispanic white	189	15.0%	1.04	1,849	6.3%	0.18
Non-Hispanic black	157	18.9%	1.47	557	6.7%	0.40
Non-Hispanic Asian	675	25.6%	0.95	123	11.9%	1.11
Marital status[b]						
Never married	645	27.4%	1.43	2,049	11.0%	0.45
Currently married/living with partner	650	15.4%	0.75	589	3.3%	0.21
Formerly married	376	14.1%	1.33	578	4.0%	0.60
US region of current residence[b]						
Northeast	357	18.8%	1.02	562	7.3%	0.39
Midwest	246	19.9%	1.38	692	5.9%	0.26
South	622	17.9%	0.76	1,163	6.7%	0.26
West	751	18.6%	0.81	808	7.5%	0.34
Education[b]						
< High school	771	21.6%	0.90	612	9.6%	0.48

Characteristics	Foreign-born women			US-born women		
	Sample size, *n*	Never screened, %	Standard error	Sample size, *n*	Never screened, %	Standard error
High school graduate/GED	431	19.9%	1.02	953	7.4%	0.30
Some college	343	15.8%	0.88	1,180	6.2%	0.22
College degree	404	14.8%	1.90	464	5.6%	1.46
Family income [b]						
<100% of poverty level	718	23.2%	1.06	1,011	9.1%	0.41
100%–199% of poverty level	578	20.3%	0.93	813	7.8%	0.35
200%–399% of poverty level	430	18.5%	0.92	864	6.8%	0.28
400% of poverty level	250	14.7%	0.99	537	5.7%	0.27
Health status [b]						
Excellent/very good	1,147	17.6%	0.56	2,026	6.4%	0.18
Good	603	19.5%	0.95	790	6.7%	0.28
Fair/poor	226	17.4%	1.46	408	8.5%	0.59
Insurance [b] (at time of interview)						
None	791	26.2%	1.43	610	10.9%	1.43
Private	649	15.5%	0.65	1,741	6.3%	0.18
Public	525	18.3%	1.02	853	7.1%	0.33
Usual place of care [b]						
None	685	28.0%	1.38	701	11.6%	0.69
Clinic or health center	497	17.9%	0.96	755	7.0%	0.30
Doctor's office or HMO	714	16.0%	0.64	1,650	6.0%	0.18
Hospital outpatient	25	11.4%	2.84	41	8.8%	1.60
Other place	17	19.3%	4.47	43	9.2%	1.60
Visits to health provider (past 12 mo) [b]						
None	822	31.1%	1.30	890	14.5%	0.60
1	358	18.1%	0.95	632	7.9%	0.39
2–3	350	14.6%	0.82	761	5.9%	0.23
4	438	13.0%	0.70	927	4.8%	0.20
Lifetime in US [b,d]						

Characteristics	Foreign-born women			US-born women		
	Sample size, *n*	Never screened, %	Standard error	Sample size, *n*	Never screened, %	Standard error
<25%	826	25.3%	1.03	NA	NA	NA
25%	1,146	16.3%	0.52	NA	NA	NA

Estimates are based on household interviews of a sample of the civilian noninstitutionalized population. Estimates were weighted using the Sample Adult weight adjusted for 5 y of data. Unless indicated, unknowns for the columns were not included in the denominators when calculating percentages, but they were included in the "Total never screened" row. Percentages may not add to totals due to rounding. All estimates are age-adjusted (except age-specific results) using the projected 2000 US population as the standard population and using age groups: 18–20, 21–29, 30–39, 40–49, 50–59, 60–64, and 65 y and older.

Adapted from NCHS, National Health Interview Survey (NHIS) Sample Adult Cancer Supplements 2005, 2008, 2010, 2013, and 2015.

[a] US women 18 y and older, who never had a hysterectomy and responded "no" to the question "Have you ever had a pap smear or pap test?"

[b] Significantly different by foreign-born *vs* US-born status at all levels (*p* < .05).

[c] Hispanic refers to persons who are of Hispanic or Latino origin and may be of any race or combination of races.

[d] Significantly different by lifetime in the US (*p* < .05).

US indicates United States; GED, general education; NA, not applicable.

TABLE 3.

Predicted Margins of Adult Women by Birthplace and Percent of Lifetime in the US: NHIS 2005, 2008, 2010, 2013, and 2015

	Never had a Pap test (age ≥ 18 y)[a]			No Pap test in the past 3 y (age 21–65 y)[b]		
	Predicted margins, %[c]	Standard error	p	Predicted margins, %[c]	Standard error	p
Birthplace and % of lifetime in the US						
US-born	7.6%	0.19		18.9%	0.29	
Foreign-born <25%	20.0%	1.01	d,e	26.6%	1.16	d,e
Foreign-born ≥25%	12.7%	0.56	d	21.2%	0.75	d
Country/region of birth						
United States	7.6%	0.19		18.9%	0.29	
Mexico	9.8%	0.66	d	15.8%	0.85	d
Central America	8.9%	1.01		15.5%	1.34	d
South America	12.6%	1.50	d	18.8%	1.81	
Caribbean	14.6%	1.38	d	23.3%	1.89	d
Southeast Asia	13.1%	1.42	d	19.3%	1.85	
Central Asia	20.4%	2.09	d	28.7%	2.54	d
South Asia (Indian Subcontinent)	22.9%	2.36	d	33.5%	3.02	d
Middle East	25.0%	3.56	d	35.1%	4.49	d
Africa	27.8%	2.58	d	36.8%	2.83	d
Europe	16.4%	1.66	d	24.9%	2.08	d
FSU	28.2%	4.02	d	42.8%	4.19	d

Adapted from NCHS, National Health Interview Survey (NHIS) Sample Adult Cancer Supplements 2005, 2008, 2010, 2013, and 2015.

[a]The denominator used for analysis is the number of US women 18 y and older without a hysterectomy. Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.

[b]The denominator used for analysis is the number of US women 21–65 y without a hysterectomy. Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.

[c] Adjusted for age, race and ethnicity, marital status, income, region of current residence, education, health status, health insurance coverage, usual place for medical care, and number of doctor visits in the past 12 mo.

[d] Significantly different from US-born ($p < .05$).

[e] Significantly different from ≥25% of lifetime in the US.

US indicates United States; FSU, Former Soviet Union.