# Breast and cervical cancer screening among Hispanic subgroups in the USA: estimates from the National Health Interview Survey 2008, 2010, and 2013 

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#### Abstract

Purpose-This study examined patterns in mammography and Pap test use across and within subpopulations of Hispanic women.

Methods-Based on data from the National Health Interview Survey (2008, 2010, and 2013), we estimated the proportion of Hispanic women reporting testing for breast and cervical cancer for specific subgroups. We examined test use by demographic characteristics using Chi-square tests.

Results-Overall, the proportion of women aged 50-74 years who reported a mammogram within the past 2 years did not differ significantly across Hispanic subgroups. Among publically and uninsured women, however, proportions of mammography utilization varied significantly across Hispanic subgroups. The proportion of women aged 21-65 years who received a Pap test within the past 3 years differed significantly across Hispanic subgroups.

Conclusions-Among subgroups of Hispanic women, patterns in mammography and Pap test use vary by insurance status, length of US residency, and type of screening. Certain subgroups of Hispanic women may benefit from culturally tailored efforts to promote breast and cervical cancer screening.


## Keywords

Hispanics; Mammography; Pap test; Healthcare disparities; Cancer screening

## Introduction

The US Preventive Services Task Force (USPSTF) recommends screening for cervical cancer by cytology for average-risk women aged 21-65 years every 3 years and screening by mammography for average-risk women aged 50-74 years every 2 years [1]. However, Hispanic women are less likely to be screened for cervical and breast cancer than nonHispanic women [2,3]. Previous studies have found variations in cancer screening across

[^0]Hispanic subgroups and underscore the importance of taking into account the heterogeneous nature of this population in public health research [2-4]. We examined variations in cervical and breast cancer screening test use across and within subgroups of Hispanic women, by insurance status, source of health care, and length of residency in the USA.

## Methods

## Data source and study population

Data were obtained from the National Health Interview Survey, an annual survey representative of the civilian, non-institutionalized US population conducted in English and Spanish by the National Center for Health Statistics, Centers for Disease Control and Prevention [5, 6]. Three years of survey data (2008, 2010, and 2013) were included in this analysis, combined from these specific, not consecutive, survey years because consistant cancer screening questions are not repeated on a yearly basis. Because screening test use trends in 2008, 2010, and 2013 were stable among all Hispanic women and within Hispanic subgroups with one exception (mammography use among Dominican women decreased significantly from $88.8 \%$ in 2010 to $67.7 \%$ in 2013) (data not shown), survey years were combined to obtain adequate sample sizes to examine variations across subgroups and variables of interest.

Female respondents were asked whether they ever had a Pap smear/Pap test or ever had a mammogram and, if so, when was their most recent Pap test or mammogram. Responses were used to calculate the proportion of the population up to date for cervical and breast cancer screening test use for any reason, as recommended by USPSTF [1]. There was some variation in response rates across survey years, $61.2 \%$ in 2013 to $60.8 \%$ in 2010 and 62.6 \% in 2008 [6]. The final sample included women aged 21-65 with no hysterectomy for the cervical cancer screening test use analyses ( $n=28,354$ ) and women aged $50-74$ for the breast cancer screening test use analyses ( $n=15,899$ ).

## Demographic characteristics

Survey respondents were asked to report the group that best represented their Hispanic origin or ancestry. Respondents were categorized as not of Hispanic/Spanish origin, or as Puerto Rican, Mexican, Mexican-American, Cuban/Cuban American, Dominican, Central or South American, or Other Hispanic. Other Hispanic combined categories that were too few in number to examine separately and included respondents who identified as multiple Hispanic, other Latin American, other Spanish, or Hispanic/Latino/Spanish nonspecific type, type refused, or type not ascertained. Length of residency in the USA, usual source of health care, and type of health insurance were analyzed as additional variables of interest.

## Statistical analyses

SAS-callable SUDAAN (RTI International, Research Triangle Park, NC) was used to calculate weighted proportions and $95 \%$ confidence intervals for populations that were up to date on breast and cervical screening recommendations, by Hispanic origin. Weights were adjusted to account for combined survey years. Cross-tabulations of Hispanic subgroups and variables of interest were produced for both breast and cervical cancer test use. Across
subgroups and within variable categories, Chi-square tests were performed, producing Wald
F statistics and $p$ values. Subgroups with estimates with a relative standard error greater than $50 \%$ were excluded from the Chi-square test. Respondents with unknown or missing responses were excluded from analyses.

## Results

Hispanic women had lower mammography use compared with non-Hispanic women (68.2 vs $73.4 \%, p<0.0001$ ) (data not shown). Proportions of women who reported having a mammogram within the past 2 years did not differ significantly across Hispanic subgroups (Table 1). Among Hispanic women who had been in the USA for less than 10 years, the large variation of mammography use across subgroups was nearly significant ( $p=0.0641$ ).

Proportions of mammography use among publicly insured and uninsured women varied significantly across Hispanic subgroups. Among women with only public health insurance, Mexican women had the lowest proportion and Dominican women the highest proportion. Among uninsured women, Puerto Rican and Cuban/Cuban American women had lower mammography use than other subgroups, with the highest proportions found in Dominican and Other Hispanic women.

Among women screened for cervical cancer, Hispanic women had significantly lower Pap test use than did non-Hispanic women ( 78.8 vs $83.3 \%, p<0.0001$ ) (data not shown). Proportions differed modestly but significantly across Hispanic subgroups, and the lowest proportions were observed in Mexican and Cuban/Cuban American women (Table 2). Among Hispanic women who had been in the USA for less than 10 years, significant differences were observed across subgroups. The lowest proportion of Pap test use was found among Cuban/Cuban American women. Significant differences across subgroups were reported among women with public insurance only. Nearly significant differences were observed among uninsured women.

## Discussion

Based on combined data from 2008, 2010, and 2013, Hispanic women had lower proportions of breast and cervical cancer screening test use than did non-Hispanic women in the USA. Overall, mammography use was comparable across Hispanic subgroups. In contrast, the proportion of women screened for cervical cancer differed across Hispanic subgroups. Ethnic subgroups with higher Pap test use did not necessarily have higher mammography use and vice versa.

Previous research has documented the positive effect of acculturation on screening status in Hispanic populations, as measured by length of residency in the USA [7]. In this study, length of US residency affected proportions of screening test use among Hispanic subgroups differently, though the effect in some subgroups differed between breast and cervical cancer screening (see Tables 1, 2). Among recent immigrants, Mexican women had higher proportions of breast cancer screening test use but lower proportions of cervical cancer screening test use than other subgroups. The opposite effect was seen for recent Central or South American immigrants, who had lower proportions of breast cancer screening test use
but higher proportions of cervical cancer screening test use than other subgroups. Uninsured
Puerto Rican women had particularly low mammography use but high Pap test use, compared with other subgroups. It is notable that cervical and breast cancer screening recommendations apply to two different age groups of women, and therefore, differences in Pap test and mammography use may be expected. These findings demonstrate that recent immigrants and uninsured Hispanic women have relatively different disparities across Hispanic subgroups when it comes to breast or cervical cancer screening test use.

Access to health insurance was an important barrier to mammography and Pap test use in some subgroups. Mexican women had the lowest proportion of mammography use among women with public insurance only. Cuban/Cuban American and Puerto Rican women had the lowest proportions of mammography use among uninsured women. For cervical cancer screening, Cuban/Cuban American women had the lowest Pap test use among women with either public insurance or no insurance. Although information was not available on legal residency status, it likely varies across subgroups and may influence insurance status.

As previously reported, this study found that Mexican women had lower Pap test use compared with other subgroups [2, 4]. An effective community-based intervention exists to increase cervical cancer screening in Hispanic women of Mexican descent. AMIGAS is an educational intervention that provides culturally appropriate bilingual information administered by promotoras or community health workers [8]. Designed for use in a variety of settings, this intervention has been demonstrated to be an effective tool to encourage screening among Mexican women, particularly those who have recently immigrated or are uninsured [8]. Similarly, community-based breast cancer screening interventions could be culturally tailored to meet the needs of recent immigrant or uninsured Hispanic groups including Puerto Rican, Central or South American, Cuban, Dominican, and others.

Limitations to this study include the cross-sectional survey design of the National Health Interview Survey. Survey findings also rely on self-reported data, which may not accurately capture ethnicity or screening status. Even though the Hispanic population was oversampled for the survey, sample sizes were still small in ethnic subgroups, especially when stratified by variables of interest. These small sample sizes resulted in wide confidence intervals and limited statistical power, in addition to the creation of the "Other Hispanic" category made up of multiple Hispanic subgroups.

This study reveals the heterogeneity of cancer screening test use within the diverse population of Hispanic women. Our findings suggest that subgroups may have different needs that vary by insurance status, length of US residency, and type of cancer screening. In particular, we observed relatively low mammography use among uninsured Puerto Rican and Cuban/Cuban American women. Low Pap test use was found among Cuban/Cuban American women who were recent immigrants or had public or no insurance. These findings offer insights that may be valuable for culturally tailored efforts to promote cancer screening within subgroups of Hispanic women.

## Acknowledgments

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Table 1

|  | Total Hispanic | Puerto Rican | Mexican | Mexican-American | Cuban/Cuban American | Dominican | Central or South American | Other Hispanic | Chisquare Wald $F p$ value |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Total \% (95 \% CI) | $\begin{aligned} & n=2,043 \\ & 68.2 \\ & (65.5-70.7) \end{aligned}$ | $\begin{aligned} & n=277 \\ & 72.6 \\ & (66.7-77.8) \end{aligned}$ | $\begin{aligned} & n=580 \\ & 65.4 \\ & (60.3-70.3) \end{aligned}$ | $\begin{aligned} & n=488 \\ & 68.8 \\ & (63.2-73.9) \end{aligned}$ | $\begin{aligned} & n=142 \\ & 62.1 \\ & (49.3-73.3) \end{aligned}$ | $\begin{aligned} & n=106 \\ & 77.1 \\ & (65.8-85.4) \end{aligned}$ | $\begin{aligned} & n=325 \\ & 67.0 \\ & (60.0-73.4) \end{aligned}$ | $\begin{aligned} & n=125 \\ & 73.6 \\ & (65.1-80.6) \end{aligned}$ | 0.1293 |
| Length of residency |  |  |  |  |  |  |  |  |  |
| US born | $\begin{aligned} & n=744 \\ & 71.2 \\ & (66.9-75.2) \end{aligned}$ | $\begin{aligned} & n=70 \\ & 77.3 \\ & (66.4-85.4) \end{aligned}$ | $\begin{aligned} & n=136 \\ & 72.9 \\ & (61.5-82.0) \end{aligned}$ | $\begin{aligned} & n=409 \\ & 69.4 \\ & (63.4-74.9) \end{aligned}$ | $\begin{aligned} & n=11 \\ & 51.9^{\dagger} \\ & (18.5-83.7) \end{aligned}$ | $\neq$ | $\begin{aligned} & \mathcal{\xi} \\ & 70.5 \\ & (31.7-92.5) \end{aligned}$ | $\begin{aligned} & n=109 \\ & 73.3 \\ & (63.8-81.1) \end{aligned}$ | 0.7379 |
| In the USA $\geq 10$ years | $\begin{aligned} & n=1,197 \\ & 68.0 \\ & (64.4-71.4) \end{aligned}$ | $\begin{aligned} & n=195 \\ & 71.4 \\ & (63.2-78.4) \end{aligned}$ | $\begin{aligned} & n=409 \\ & 63.9 \\ & (57.5-69.8) \end{aligned}$ | $\begin{aligned} & n=73 \\ & 65.1 \\ & (49.7-77.9) \end{aligned}$ | $\begin{aligned} & n=117 \\ & 66.9 \\ & (53.0-78.4) \end{aligned}$ | $\begin{aligned} & n=98 \\ & 80.5 \\ & (69.3-88.3) \end{aligned}$ | $\begin{aligned} & n=289 \\ & 69.3 \\ & (61.7-75.9) \end{aligned}$ | $\begin{aligned} & n=16 \\ & 75.3 \\ & (47.5-91.2) \end{aligned}$ | 0.1572 |
| In the USA < 10 years | $\begin{aligned} & n=82 \\ & 53.0 \\ & (40.4-65.3) \end{aligned}$ | $\begin{aligned} & s \\ & 54.3 \\ & (34.7-72.7) \end{aligned}$ | $\begin{aligned} & n=29 \\ & 75.9 \\ & (54.5-89.2) \end{aligned}$ | $\begin{aligned} & \S \\ & 76.5^{\dagger} \\ & (20.6-97.6) \end{aligned}$ | $\begin{aligned} & n=12 \\ & 22.8^{\dagger} \\ & (8.8-47.6) \end{aligned}$ | $\dagger$ | $\begin{aligned} & n=23 \\ & 35.1 \\ & (19.1-55.4) \end{aligned}$ | \% | 0.0641 |
| Usual source of care |  |  |  |  |  |  |  |  |  |
| Has usual source | $\begin{aligned} & n=1,774 \\ & 74.1 \\ & (71.4-76.7) \end{aligned}$ | $\begin{aligned} & n=259 \\ & 74.9 \\ & (68.7-80.3) \end{aligned}$ | $\begin{aligned} & n=484 \\ & 72.5 \\ & (67.5-77.0) \end{aligned}$ | $\begin{aligned} & n=432 \\ & 73.7 \\ & (67.4-79.1) \end{aligned}$ | $\begin{aligned} & n=114 \\ & 70.4 \\ & (55.6-81.9) \end{aligned}$ | $\begin{aligned} & n=95 \\ & 82.6 \\ & (72.7-89.5) \end{aligned}$ | $\begin{aligned} & n=275 \\ & 75.3 \\ & (68.0-81.3) \end{aligned}$ | $\begin{aligned} & n=115 \\ & 76.0 \\ & (66.9-83.2) \end{aligned}$ | 0.5817 |
| None or hospital emergency department | $\begin{aligned} & n=269 \\ & 32.4 \\ & (25.9-39.6) \end{aligned}$ | $\begin{aligned} & n=18 \\ & 42.4^{\dagger} \\ & (20.4-67.8) \end{aligned}$ | $\begin{aligned} & n=96 \\ & 33.7 \\ & (22.8-46.7) \end{aligned}$ | $\begin{aligned} & n=56 \\ & 31.0 \\ & (19.2-45.9) \end{aligned}$ | $\begin{aligned} & n=28 \\ & 30.5 \\ & (21.7-40.9) \end{aligned}$ | † | $\begin{aligned} & n=50 \\ & 25.7 \\ & (14.0-42.3) \end{aligned}$ | $\begin{aligned} & n=10 \\ & 46.1^{\dagger} \\ & (21.0-73.4) \end{aligned}$ | 0.8316 |
| Health insurance |  |  |  |  |  |  |  |  |  |
| Private/military | $\begin{aligned} & n=851 \\ & 80.8 \\ & (77.7-83.6) \end{aligned}$ | $\begin{aligned} & n=101 \\ & 80.7 \\ & (72.3-87.0) \end{aligned}$ | $\begin{aligned} & n=212 \\ & 83.5 \\ & (77.3-88.3) \end{aligned}$ | $\begin{aligned} & n=262 \\ & 77.5 \\ & (71.3-82.7) \end{aligned}$ | $\begin{aligned} & n=45 \\ & 86.1 \\ & (76.1-92.4) \end{aligned}$ | $\begin{aligned} & n=25 \\ & 72.4 \\ & (43.0-90.1) \end{aligned}$ | $\begin{aligned} & n=121 \\ & 84.8 \\ & (75.8-90.8) \end{aligned}$ | $\begin{aligned} & n=85 \\ & 77.1 \\ & (66.1-85.3) \end{aligned}$ | 0.5380 |
| Public only | $\begin{aligned} & n=772 \\ & 67.2 \\ & (62.9-71.3) \end{aligned}$ | $\begin{aligned} & n=157 \\ & 72.9 \\ & (63.1-80.9) \end{aligned}$ | $\begin{aligned} & n=184 \\ & 59.9 \\ & (51.0-68.3) \end{aligned}$ | $\begin{aligned} & n=163 \\ & 64.9 \\ & (54.4-74.2) \end{aligned}$ | $\begin{aligned} & n=67 \\ & 64.3 \\ & (44.6-80.1) \end{aligned}$ | $\begin{aligned} & n=66 \\ & 84.4 \\ & (76.2-90.1) \end{aligned}$ | $\begin{aligned} & n=107 \\ & 71.1 \\ & (60.9-79.5) \end{aligned}$ | $\begin{aligned} & n=28 \\ & 63.6 \\ & (42.4-80.6) \end{aligned}$ | 0.0110* |
| Uninsured | $\begin{aligned} & n=414 \\ & 43.7 \\ & (37.9-49.7) \end{aligned}$ | $\begin{aligned} & n=19 \\ & 19.0^{\dagger} \\ & (7.2-41.7) \end{aligned}$ | $\begin{aligned} & n=180 \\ & 48.5 \\ & (39.3-57.8) \end{aligned}$ | $\begin{aligned} & n=62 \\ & 41.8 \\ & (29.6-55.2) \end{aligned}$ | $\begin{aligned} & n=30 \\ & 21.3 \\ & (14.2-30.7) \end{aligned}$ | $\begin{aligned} & n=15 \\ & 66.9 \\ & (34.6-88.6) \end{aligned}$ | $\begin{aligned} & n=96 \\ & 38.1 \\ & (28.4-48.9) \end{aligned}$ | $\begin{aligned} & n=12 \\ & 72.8 \\ & (43.5-90.3) \end{aligned}$ | 0.0011 * |

[^1]Source: NHIS 2008, 2010, 2013. $n=$ sample size
$* 0.05$ level


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[^1]:    Source NHIS 2008, 2010, 2013, $n=$ mple size
    Source: NHIS 2008, 2010, 2013. $n=$ sample size
    ${ }^{*} 0.05$ level
    ${ }^{\dagger}$ Estimates considered unreliable; these data have a relative standard error $(\mathrm{RSE})>30$ to $50 \%$ and should be used with caution. Data not shown have an RSE $>50 . \%$

