
National Health Statistics Reports

Number 129 ■ October 9, 2019

Breast Cancer Screening Among Women by Nativity, Birthplace, and Length of Time in the United States

by Tainya C. Clarke, Ph.D., M.P.H., National Center for Health Statistics; and Meheret Endeshaw, M.P.H., Denise Duran, M.P.H., and Mona Saraiya, M.D., M.P.H., National Center for Chronic Disease Prevention and Health Promotion

Abstract

Objective—The U.S. Preventive Services Task Force (USPSTF) recommends biennial mammography screening for women aged 50–74 to reduce mortality from breast cancer. In the United States, foreign-born women have historically had higher breast cancer mortality rates than their U.S.-born peers. This report presents national estimates of mammography screening among women by nativity, birthplace, and percentage of lifetime living in the United States.

Methods—Combined data were analyzed from 29,951 women aged 50–74 years who participated in the 2005, 2008, 2010, 2013, and 2015 National Health Interview Survey. The percentage of these women who ever had a mammogram and met the USPSTF recommendations for screening by nativity, birthplace, and percentage of lifetime in the United States was generated. Estimates were adjusted for selected demographic, socioeconomic, and health care access and utilization factors and presented as predictive margins.

Results—Overall, foreign-born women were less likely than U.S.-born women to have ever had a mammogram (88.3% compared with 94.1%). Foreign-born women living in the United States for less than 25% of their lifetime were less likely to have ever had a mammogram (76.4%) or meet the USPSTF recommendations (55.0%) compared with U.S.-born women. Foreign-born women living in the United States for 25% or more of their lifetime were also less likely to have ever had a mammogram (90.9%) compared with U.S.-born women. After adjustment for selected sociodemographic characteristics, the percentage of foreign-born women who ever received a mammogram increased but was still lower than that of U.S.-born women. Foreign-born women residing in the United States for less than 25% of their lifetime were as likely as U.S.-born women to have met the USPSTF recommendations (72.1% and 72.4%, respectively), while those residing in the United States for 25% or more of their lifetime (75.1%) were more likely to do so than U.S.-born women. Differences by birthplace were also observed.

Keywords: mammography • acculturation • health disparities • National Health Interview Survey

Introduction

In the United States, breast cancer is the most common cancer in women (excluding nonmelanoma skin cancer) (1). Although morbidity and mortality have remained stable, in 2016, the latest year for which incidence data are available, 245,299 new cases of breast cancer were reported among women, and 41,487 women died of breast cancer in the United States (2). For every 100,000 women, 124 cases of breast cancer were reported, and 20 died of cancer (2). Breast cancer is the leading cause of cancer-related death among Hispanic women, and the second-leading cause among white, black, Asian or Pacific Islander, and American Indian or Alaska Native women in the United States (1). Breast cancer incidence and mammography receipt are associated with race and ethnicity, income or poverty status, education, health insurance status, and foreign-born status (3,4). These correlates often lead to the observed race and ethnicity disparities in breast cancer-related morbidity and mortality. Research on breast cancer screening by birthplace among foreign-born women residing in the United States is scarce.



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics



More than 43.7 million persons, accounting for 13.5% of the U.S. population, are foreign born. This proportion is expected to grow to about 70 million, or 20% of the population, in the next 40 years (5,6). Approximately 51% of the foreign-born population in the United States is female (5,6). Compared with their U.S.-born counterparts, foreign-born women often experience an elevated cancer risk because of lifestyle changes associated with living in the United States (7–9). Understanding the screening experience of foreign-born women compared with U.S.-born women is important because immigrant women may not be exposed to the same level of public health messaging or screening opportunities in their home countries (10–13).

Past studies of breast cancer screening among foreign-born women living in the United States have focused on specific population subgroups (14,15). Some have looked at language barriers, and others have looked at adaptation to western culture (16–18). However, few have examined the relationship between mammography receipt and the birthplace of ethnically diverse foreign-born women, and none have examined the percentage of time living in the United States, as factors affecting the likelihood of having a mammogram. Cervical cancer research has shown that whether a woman is likely to ever be screened, as well as adhere to screening recommendations, varies by birthplace (19).

Although mammography does not detect all tumors of the breast, it can often detect breast cancer at an early stage when treatment is more effective (20,21). The reduction and stability of breast cancer mortality and morbidity rates in North American and European countries over the past 2 decades have been attributed to early detection through mammography and improved treatment (2–4). The U.S. Preventive Services Task Force (USPSTF) recommends biennial mammography screening for women aged 50–74 who have an average risk of breast cancer (22).

Using the National Health Interview Survey (NHIS), this report examines the percentage of women aged 50–74 who have ever received a mammogram

as well as those who met the USPSTF recommendations for screening according to nativity status (U.S. or foreign born) and percentage of time in the United States. Compliance with screening recommendations among foreign-born women is also described according to birthplace.

Methods

Data source

Data in this report are from the combined 2005, 2008, 2010, 2013, and 2015 NHIS. NHIS is a multipurpose, cross-sectional health survey of the U.S. civilian noninstitutionalized population, based on a stratified multistage sample of U.S. households (23,24). Data are collected in person at the respondent's home using computer-assisted personal interviewing, but follow-ups for completing interviews may be conducted over the telephone if needed. The survey consists of both a core set of questions that remain relatively unchanged from year to year as well as supplemental questions that are asked periodically. Within each household, information is collected at the family level, then a sample adult is selected to answer additional questions about his or her individual health and health behaviors such as cancer screening.

Data selected for this study were restricted to years in which NHIS fielded a cancer supplement. Based on USPSTF recommendations for breast cancer screening applicable to the study period (22,25,26), the analysis was further restricted to women aged 50–74 at interview ($n = 29,951$). Final sample adult response rates varied across survey years: 69.0% in 2005, 62.6% in 2008, 60.8% in 2010, 61.2% in 2013, and 55.2% in 2015 (27).

Mammography receipt

In NHIS, women aged 30 and over were asked, “Have you ever had a mammogram?” Those who responded “no” were categorized as never having had a mammogram. Those who responded “yes” were then asked, “When did you have your most recent

mammogram?” Current age and time of most recent screening were used to calculate the proportion of women who had a mammogram in the past 2 years for breast cancer screening out of all women reporting ever having had a mammogram. Women who have had a mammogram but did not have one in the past 2 years, and those who had never had a mammogram in their lifetime, were categorized as not meeting USPSTF recommendations.

Nativity, birthplace, and percentage of lifetime in United States

Nativity

Data from the restricted-use NHIS file, which contains information on the respondent's country of birth, were used to determine nativity and birthplace. Women who were born in one of the 50 states, the District of Columbia (D.C.), or Puerto Rico or another U.S. territory (American Samoa, Guam, Northern Mariana Islands, and U.S. Virgin Islands), as well as those born outside the United States to parents with U.S. citizenship, were considered to be U.S.-born. Women not in these categories were considered foreign born.

Birthplace

Among foreign-born women, country of birth, geographic proximity, cultural commonalities, socioeconomic differences and similarities, and sample size guided the creation of the variable of regional birthplace categories used for analysis. Mexico was placed in its own category due to the large number of foreign-born Mexican persons living in the United States. Central America and the Caribbean islands were also presented separately due to sample size.

Africa and the Middle East were combined for this analysis due to small sample size as well as geographic proximity. Europe (Western Europe) and Russia (as well as former Union of Soviet Socialist Republics areas) were combined due to small sample sizes, some cultural similarities, and geographic proximity. The remaining birthplace categories used in this analysis were South America, Central Asia (labeled Asia), Southeast

Asia, South Asia (Indian subcontinent), and Other. Note that, because of small sample sizes, foreign-born women from Canada (0.32%) and Oceania and other unspecified countries or regions (0.08%) were placed in the Other category. However, due to their vast socioeconomic and cultural differences, this group is not discussed in statistical comparisons. The birthplace variable is a geographic measure of region of birth and is not intended to indicate legal status or citizenship.

Percentage of lifetime in United States

The length of stay or residence in the United States was calculated by using the year from the response to the question, “In what year did {person} come to the United States to stay?” and subtracting it from the year of interview. Length of stay was then divided by the respondent’s age and multiplied by 100 to determine the percentage of lifetime living in the United States. This measure was divided into two categories: less than 25% and 25% or more of lifetime residing in the United States. Categorization was based on previous research on the health-related behaviors of foreign-born persons living in the United States (19,28–32). These studies revealed that persons who spent less of their life in the United States showed similar health behaviors and access and utilization of health care services compared with non-English-speaking immigrants.

Sociodemographic variables

Sociodemographic characteristics of U.S. women presented in this report include sex, age group, educational attainment, poverty status, marital status, Hispanic or Latino origin, and race. All characteristics were measured at the time of the interview. Detailed information on the categories used for these variables can be found in Endeshaw et al. (19) and other sources (33).

Health status and health care access and utilization

Health status was based on the question, “Would you say your health in general is excellent, very good, good, fair, or poor?” “Excellent” and “very good” were combined in this analysis, as were “fair” and “poor.”

Health insurance coverage was presented as a four-category variable: private, public, Medicare, and uninsured. A person was defined as uninsured if he or she did not have any private health insurance, Medicare, Medicaid, state-sponsored or other government-sponsored health plan, or military plan at the time of interview. A person was also defined as uninsured if he or she had only Indian Health Service coverage or had only a private plan that paid for one type of service, such as accidents or dental care. Public health insurance included persons on Medicaid, persons with dual Medicare and Medicaid enrollment, and persons with military coverage or other government health insurance coverage. Persons aged 65 and over with Medicare coverage only, including Medicare Advantage plans, were placed in a separate category.

Usual place of care was based on a survey question, “Is there a place that you usually go to when you are sick or need advice about your health?” For number of visits to a health care provider, respondents were asked, “During the past 12 months, how many times have you seen a doctor or other health care professional about your own health at a doctor’s office, a clinic, or some other place?” Respondents were instructed to exclude overnight hospitalizations, visits to hospital emergency rooms, home visits, dental visits, and telephone calls.

U.S. region of current residence

For region of current U.S. residence, the 50 states and D.C. were categorized into nine regions:

- New England—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
- Mid-Atlantic—Delaware, D.C., Maryland, New Jersey, New York, Pennsylvania

- East North Central—Illinois, Indiana, Michigan, Ohio, Wisconsin
- West North Central—Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
- South Atlantic—Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia
- East South Central—Alabama, Kentucky, Mississippi, Tennessee
- West South Central—Arkansas, Louisiana, Oklahoma, Texas
- Mountain—Arizona, Colorado, Idaho, Nevada, New Mexico, Montana, Utah, Wyoming
- Pacific—Alaska, California, Hawaii, Oregon, Washington

Statistical analyses

Estimates in this report were calculated using the sample adult sampling weights and are representative of the civilian noninstitutionalized population of U.S. women aged 50–74. Weights were adjusted to account for combined survey years. Data weighting procedures are described in more detail elsewhere (23,24). Point estimates, and estimates of their variances, were calculated using SAS-callable SUDAAN version 11.0.0 (34,35), a software package that accounts for the complex sample design of NHIS. Unless otherwise specified, the denominator used was women aged 50–74. Calculations excluded persons with unknown information on the variables examined.

Descriptive statistics of the population (Figure 1, Table 1) and estimates of ever receiving a mammogram and meeting the USPSTF recommendations for screening (Figure 2) by nativity and percentage of lifetime in the United States are unadjusted. Figure 3 and Table 2 present estimates of mammography receipt adjusted for age, marital status, poverty status, U.S. region of current residence, educational attainment, health status, health insurance coverage, usual place for medical care, and number of doctor visits in the past 12 months; these are presented as predictive margins from logistic regression models. The predictive marginal approach is a regression-based equivalent of the common epidemiological technique of

standardization, in which the estimates are proportionally adjusted according to a weight for each level of the confounding factors. The marginal probabilities obtained reflect a weighted average over the distribution of the confounders and are equivalent to estimates obtained by standardizing to the total population (36). This means that comparisons of mammography receipt by birthplace and percentage of lifetime in the United States 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 should largely reflect differences by birthplace and percentage of lifetime in the United States. Because correlation analyses showed that race and ethnicity were highly correlated with birthplace, they were not included in the group of sociodemographic variables used for standardization.

Significant differences in demographic characteristics and mammography receipt among U.S. women by nativity, birthplace, and

percentage of lifetime living in the United States were compared using two-sided *t* tests at the 0.05 level and assuming consistency, asymptotic normality, and asymptotic independence of the estimates (37). Terms such as “more likely” and “less likely” indicate a statistically significant difference. Terms such as “not significantly different” indicate that no statistically detectable differences were found between the estimates being compared. In this report, estimates that do not meet National Center for Health Statistics standards of reliability as specified in the “National Center for Health Statistics Data Presentation Standards for Proportions” (38) are denoted by an asterisk (*).

Results

Birthplace

Among women aged 50–74, the majority were born in one of the 50 states, D.C., or a U.S. territory, or abroad to parents who were U.S. citizens (86.9%); 13.1% were born in other

countries (Figure 1). Among foreign-born women, 20.4% were born in Mexico, 18.3% in Europe, 13.5% in Southeast Asia, 13.1% in the Caribbean, and the remainder in other specified regions (Table 1).

Sociodemographic characteristics

The distribution of selected sociodemographic characteristics examined in this study differed by nativity and percentage of lifetime in the United States (Table 2). The percentage of foreign-born Hispanic women (38.9%) was more than eight times that of U.S.-born Hispanic women (4.8%). Hispanic women also constituted the largest proportion of foreign-born women, regardless of the length of time in the United States (43.5% for less than 25% of their lifetime and 37.8% for 25% or more of lifetime). More non-Hispanic black women were born in the United States (11.8%) than abroad (7.9%). The percentage of foreign-born Asian women (26.5%) was more than twentyfold higher than the percentage of U.S.-born Asian

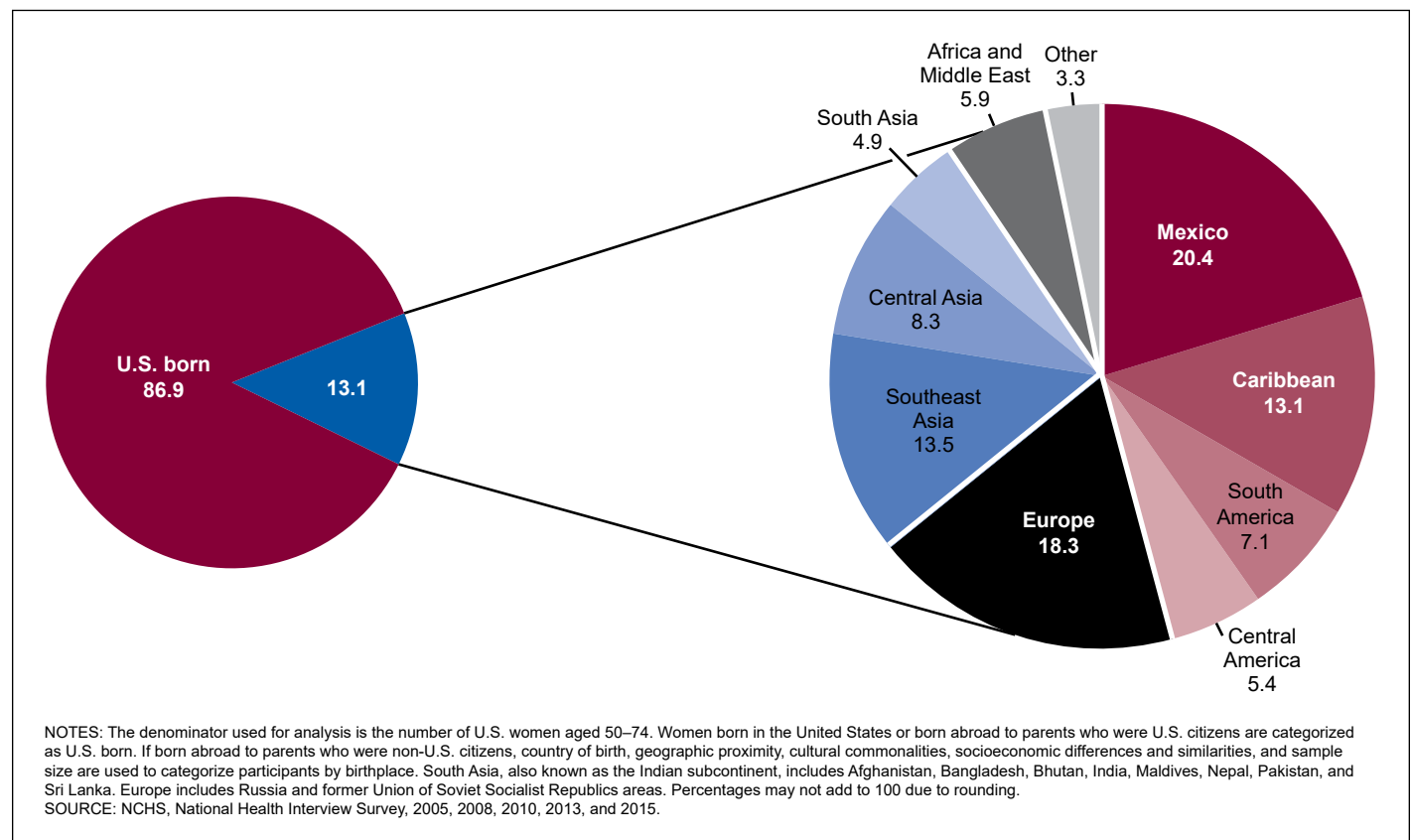


Figure 1. Percent distribution of women aged 50–74, by birthplace: United States, 2005, 2008, 2010, 2013, and 2015

women (0.8%). Compared with U.S.-born women, foreign-born women were more likely to be currently married or living with a partner (66.7% compared with 62.9%), have less than a high school education (30.2% compared with 11.1%), and live below the federal poverty level (16.7% compared with 9.2%).

Foreign-born women residing in the United States for less than 25% of their lifetime were more likely to have less than a high school education (38.3%) and less likely to have some college education (13.7%) compared with U.S.-born women (11.1% and 31.2%, respectively). Foreign-born women living in the United States for less than 25% of their lifetime were more likely to be living below the federal poverty level (24.1%) and at 100%–199% of the federal poverty level (28.5%), but less likely to live at 400% or more of the federal poverty level (17.6%) compared with U.S.-born women.

Health status and health care access and utilization

Compared with U.S.-born women, foreign-born women were less likely to have excellent or very good health (43.6% compared with 51.7%), more likely to have fair or poor health (22.3% compared with 18.6%), more than twice as likely to be uninsured (17.8% compared with 7.4%), and more likely to have public health insurance (19.8% compared with 13.5%) and Medicare only or Medicare Advantage (10.6% compared with 9.3%). This pattern held true regardless of percentage of lifetime in the United States. Foreign-born women were more than twice as likely to not have a usual place of care compared with U.S.-born women (11.8% compared with 5.8%). Foreign-born women were more likely than U.S.-born women to have had no visit to a health care provider (14.1% compared with 8.4%) or only one visit (15.8% compared with 12.5%) in the past 12 months.

Foreign-born women living in the United States for less than 25% of their lifetime were more likely to have fair or poor health (25.7%) compared with U.S.-born women (18.6%). Foreign-born women living in the United States for less than 25% of their lifetime were

also less likely to have Medicare only or Medicare Advantage than U.S.-born women (6.7% compared with 9.3%). On the contrary, foreign-born women living in the United States for 25% or more of their lifetime were more likely to have Medicare only or Medicare Advantage (11.5%) compared with U.S.-born women.

Foreign-born women living in the United States for less than 25% of their lifetime were more than four times as likely to be uninsured (33.5%) compared with U.S.-born women (7.4%). Foreign-born women living in the United States for less than 25% of their lifetime were more likely to not have a usual place of care (22.2%) compared with U.S.-born women (5.8%). They were also more likely to have no visits to a health care provider in the past 12 months (23.2%) compared with U.S.-born women (8.4%).

U.S. region of current residence

The population distribution of U.S.-born women differed from foreign-born women when compared with the region of current U.S. residence. While the majority of U.S.-born women were distributed across five of the nine regions examined (Mid-Atlantic [15.2%], East North Central [17.0%], South Atlantic [18.1%], West South Central [11.0%], and Pacific [12.4%]), more than two-thirds of foreign-born women in the United States resided in the Mid-Atlantic (20.8%), South Atlantic (16.2%), and Pacific (32.1%) regions. No difference in distribution was observed among the nine regions of current U.S. residence for foreign-born women by percentage of lifetime in the United States.

Mammography screening

U.S. born compared with foreign born

Unadjusted estimates—Overall, foreign-born women were less likely than U.S.-born women to have ever had a mammogram (88.3% compared with 94.1%) (Figure 2). Foreign-born women who resided in the United States for less than 25% of their lifetime were less likely to have ever had a mammogram

than U.S.-born women (76.4% compared with 94.1%). Foreign-born women who spent more than 25% of their lives living in the United States were also less likely to have ever had a mammogram (90.9%) compared with U.S.-born women. However, the percentage point difference was less than that of foreign-born women who resided in the United States for less than 25% of their lifetime.

Foreign-born women were less likely than U.S.-born women to have met the USPSTF recommendation of having had a mammogram in the past 2 years (68.8% compared with 73.0%). Foreign-born women who spent less than 25% of their lifetime living in the United States were also less likely than U.S.-born women to have met the USPSTF recommendation for screening (55.0% compared with 73.0%). No statistically significant difference was found between foreign-born women who spent 25% or more of their lifetime living in the United States (71.8%) and U.S.-born women.

Adjusted estimates—After adjustment, the differences in the percentage of women ever screened were attenuated. Overall, foreign-born women (91.4%)—both those who resided in the United States for less than 25% of their lifetime (87.6%) and those who lived in the United States for 25% or more of their lifetime (92.5%)—remained less likely than U.S.-born women (93.9%) to have ever had a mammogram (Figure 3). However, the percentage point differences were smaller. With regard to meeting USPSTF recommendations for screening, no significant difference was observed between U.S.-born women (72.4%) and foreign-born women (74.4%), particularly those who resided in the United States for less than 25% of their lifetime (72.1%). Although the percentage point difference was relatively small, foreign-born women who lived in the United States for 25% or more of their lifetime (75.1%) were more likely to have met the USPSTF recommendations compared with U.S.-born women.

U.S. born compared with foreign born by birthplace

Unadjusted estimates—Foreign-born women from Mexico (85.8%), the Caribbean (87.3%), South America

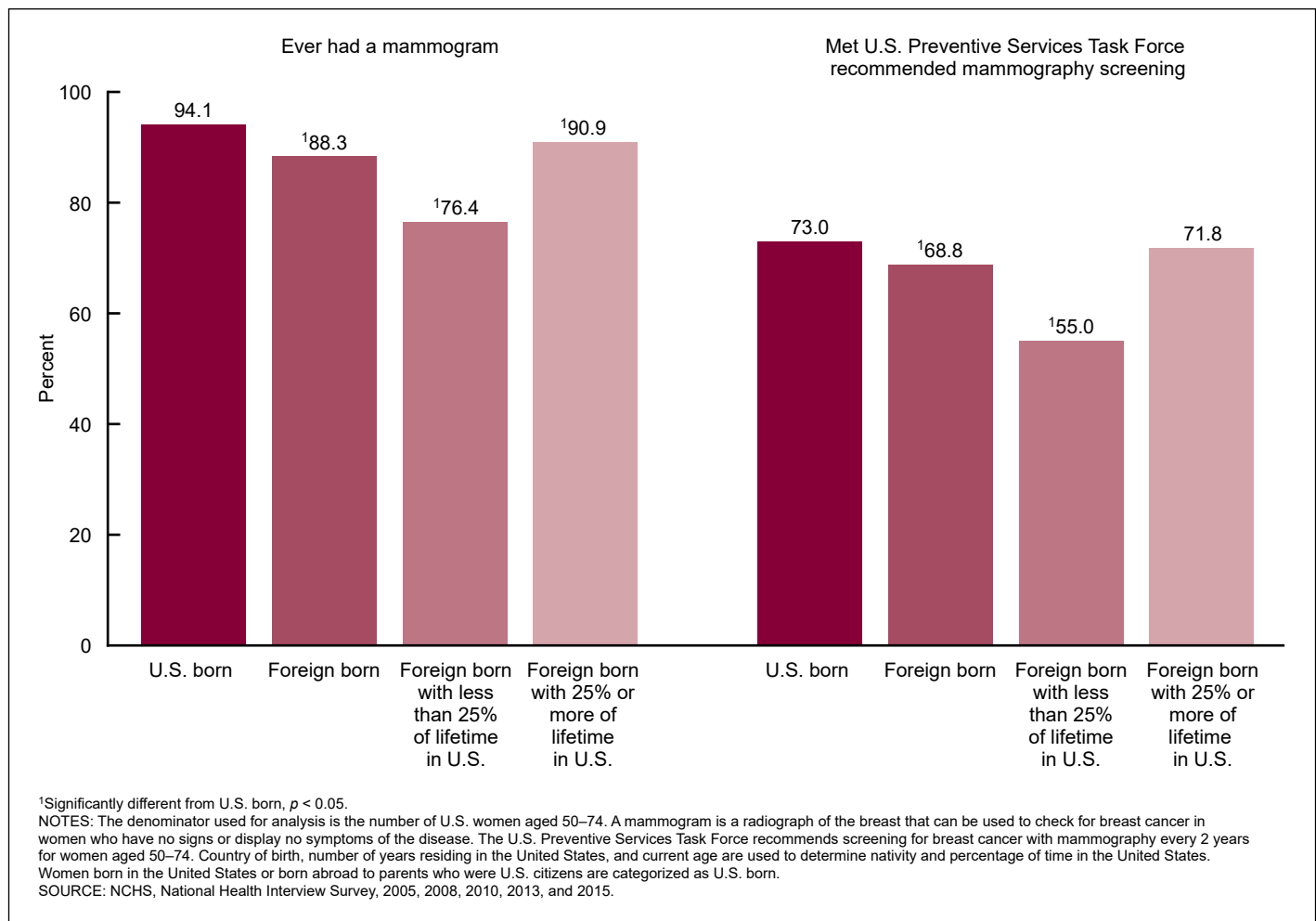


Figure 2. Unadjusted estimates of mammography receipt among women aged 50–74, by nativity and percentage of lifetime in United States: National Health Interview Survey, 2005, 2008, 2010, 2013, and 2015

(89.4%), Africa and the Middle East (86.1%), Central Asia (82.8%), Southeast Asia (89.2%), and South Asia (83.7%) were less likely than those born in the United States (94.1%) to have ever had a mammogram, while the differences for those born in Central America (93.3%) and Europe (92.4%) were not statistically significant (Table 3).

Differences in meeting the USPSTF recommendations for breast cancer screening were also observed by birthplace. Foreign-born women from Mexico (65.1%), Central Asia (59.6%), and South Asia (60.9%) were less likely to have met the USPSTF recommendations compared with U.S.-born women. However, no significant difference was found in the percentage of those who met the USPSTF recommendations for screening among women born in the Caribbean (72.3%), Central America (72.6%), South America (67.3%), Africa and the Middle East

(66.2%), Southeast Asia (72.8%), and Europe (72.9%) compared with U.S.-born women (73.0%).

Adjusted estimates—After adjustment, differences by birthplace resulted in a change in pattern for some groups (Table 3). The percentage of women who had ever had a mammogram was still lower among those born in Central Asia (84.1%), Southeast Asia (88.8%), and South Asia (81.5%) compared with U.S.-born women (93.9%). However, there was no longer a significant difference in ever receiving a mammogram between U.S.-born women and women from Mexico (93.7%), the Caribbean (91.8%), South America (93.3%), and Africa and the Middle East (88.4%), while women from Central America (96.6%) were more likely to have ever been screened compared with U.S.-born women.

U.S.-born women were less likely to have met the USPSTF recommendations

compared with foreign-born women from Mexico (81.4%), the Caribbean (78.6%), and Central America (82.8%). However, women born in Central Asia (61.6%) and South Asia (58.4%) remained less likely to have met the USPSTF recommendations compared with U.S.-born women.

Discussion

In this report, unadjusted estimates show significant differences in mammography receipt between foreign-born and U.S.-born women. After adjusting for several sociodemographic characteristics—including education, age, marital status, and usual place of care, which are usually some of the most prominent factors associated with mammography receipt (39–41)—the difference in ever having a mammogram between foreign-born women residing

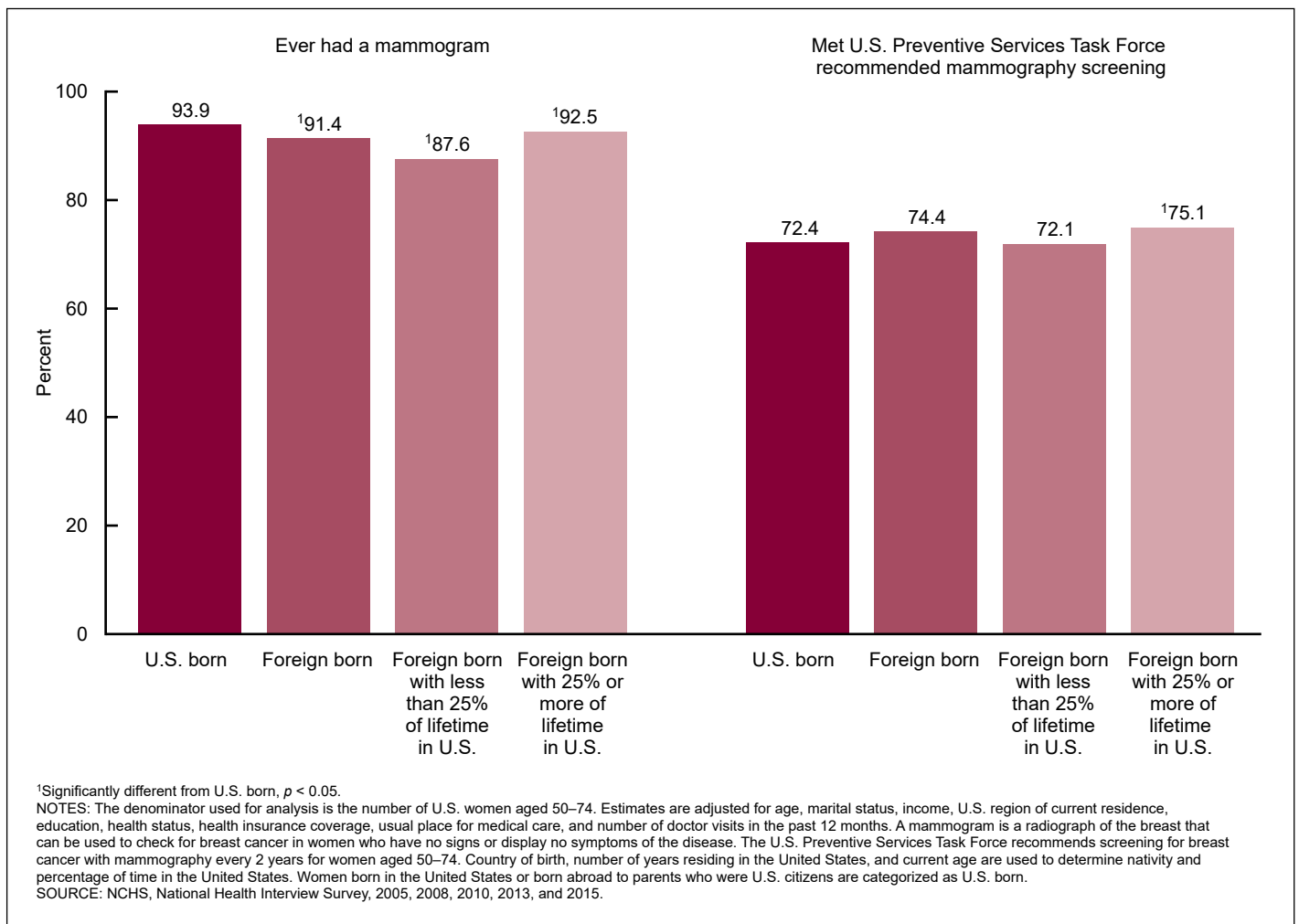


Figure 3. Predicted marginal distributions of mammography receipt among women aged 50–74, by nativity and percentage of time in United States: National Health Interview Survey, 2005, 2008, 2010, 2013, and 2015

in the United States for less than 25% of their lifetime and U.S.-born women was reduced by more than 10 percentage points (76.4% compared with 94.1% narrowed to 87.6% compared with 93.9%), although the difference remained statistically significant. A similar pattern was seen for the likelihood of meeting the USPSTF recommendations among foreign-born women who spent less than 25% of their lifetime compared with women born in the United States. After adjustment, those who spent 25% or more of their lifetime in the United States were slightly more likely than U.S.-born women to have met the USPSTF recommendations, although this difference was still significantly different.

Adjustment for sociodemographic characteristics also affected differences in mammography receipt by birthplace. The differences in lifetime mammography

receipt between U.S.-born women and foreign-born women from Mexico, the Caribbean, South America, and Africa and the Middle East were attenuated and no longer significant. Adjustment resulted in women from some foreign-born regions being more likely to have met the USPSTF recommendations for screening compared with U.S.-born women, while for others, differences in receipt of recommended mammography compared with U.S.-born women were attenuated and no longer significant.

Previous studies have shown that morbidity and mortality associated with breast cancer is reduced by routine screening (12,42). Some studies have found that in the absence of cultural barriers, foreign-born women may be more receptive to physician recommendations compared with U.S.-born women (43). However, this analysis

shows that foreign-born women from predominantly Spanish-speaking regions such as Mexico and Central America had a higher prevalence of adherence to USPSTF recommendations for mammography compared with U.S.-born women, while foreign-born women from other countries did not. The reduced difference in foreign-born women from Spanish-speaking regions after adjustment may be explained, in part, by targeted health care and mammography programs in some states (44–52). The inability to further assess differences by birthplace and percentage of lifetime in the United States due to sample size precludes further assumptions related to mammography screening and birthplace in this report. However, these findings may inform future research.

The reduced differences in having ever been screened and meeting the

USPSTF recommendations among foreign-born women who have lived in the United States for 25% or more of their lifetime after adjustment is supported by research that suggests time spent in the United States can be used as an indirect measure or proxy of acculturation. In their report titled, “Assimilation Today,” Myers and Pitkin suggested that evidence showed the latest immigrants to the United States were quickly adapting to their new home and following in the footsteps of migrants from early U.S. history (53). Other research has shown that the length of time spent in the United States is highly correlated with English language adoption (28,29). These studies also reported that the adoption of English in everyday communication among Spanish-speaking persons was shown to predict breast cancer screening.

In summary, after adjustment for potential confounders, regardless of the percentage of lifetime in the United States, foreign-born women were still less likely to ever have received a mammogram. However, this pattern differed to some extent by birthplace. After adjustment, foreign-born women who resided in the United States for less than 25% of their lifetime were as likely as U.S.-born women to have met the USPSTF recommendations for breast cancer screening. Although the relative difference was small, foreign-born women who resided in the United States for 25% or more of their lifetime were more likely than U.S.-born women to have met the USPSTF recommendations. This was also true of women from Mexico, the Caribbean, and Central America.

The data in this report have some limitations. Responses are dependent on participants’ recall of ever receiving, and recent receipt of, a mammogram, as well as their willingness to accurately report information on socioeconomic factors and health care access and utilization. Due to small sample size, and to increase the precision of mammography estimates at very detailed levels, data were used from five periodic cancer supplements spanning 11 years. While sampling errors are significantly reduced by combining data across years, limitations are also associated with this estimation procedure

because it only provides an average across the years. However, preliminary analysis using Joinpoint software showed no significant trend in ever having received a mammogram across the survey years within the sample (54,55). Lastly, despite combining data across years, small sample sizes prevented some group differences from reaching statistical significance as well as examining the interaction between percentage of lifetime in the United States and birthplace on mammography receipt.

A major strength of these analyses is that the data were from a nationally representative sample of civilian noninstitutionalized adults living in the United States, allowing for population estimates. Although data were pooled across years, the consistency of the questions examined from NHIS allows for a large enough sample size to permit subgroup analyses. Because both foreign- and U.S.-born women in this study received the same survey instrument, comparisons between these two groups are more likely to accurately measure the differences due to birthplace, compared with using multiple national surveys with different questions and sampling methods. Analytically, estimating and interpreting adjusted predictions and marginal effects make the results more tangible and provide a more accurate picture of relative differences. Compared with the direct standardization approach, the predictive marginal approach permits the use of a larger number of variables in the standardization process.

These findings may inform other research on the potential relationship with, and impact of, nativity, percentage of lifetime in the United States, and birthplace, and the likelihood of engaging in recommended preventive cancer screening.

References

- Centers for Disease Control and Prevention. Breast cancer statistics. Available from: <https://www.cdc.gov/cancer/breast/statistics/index.htm>.
- U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2018 submission data

(1999–2016). Centers for Disease Control and Prevention; National Cancer Institute. 2019. Available from: <https://gis.cdc.gov/Cancer/USCS/DataViz.html>.

- White A, Thompson TD, White MC, Sabatino S, de Moor J, Doria-Rose PV, et al. Cancer screening test use—United States, 2015. *MMWR Morb Mortal Wkly Rep.* 66(8):201–6. 2017.
- Clarke TC, Endeshaw M, Duran D, Saraiya M. QuickStats: Percentage of U.S. women aged 50–74 years who never had a mammogram, by place of birth and length of residence in the United States—National Health Interview Survey, 2013 and 2015. *MMWR Morb Mortal Wkly Rep* 66(11):309. 2017.
- Zong J, Batalova J, Hallock J. Frequently requested statistics on immigrants and immigration in the United States. Migration Policy Institute. 2018. Available from: <https://www.migrationpolicy.org/article/frequently-requested-statistics-immigrants-and-immigration-united-states-7>.
- Migration Policy Institute. U.S. immigrant population by state and county. Available from: <https://www.migrationpolicy.org/programs/data-hub/charts/us-immigrant-population-state-and-county>.
- Khan F, Ruterbusch JJ, Gomez SL, Schwartz K. Differences in the cancer burden among foreign-born and US-born Arab Americans living in metropolitan Detroit. *Cancer Causes Control* 24(11):1955–61. 2013.
- Kato I, Yee CL, Ruterbusch J, Schwartz K. Patterns of cancer in first generation immigrants from the Arab League and other countries. *J Registry Manag* 36(3):71–6; quiz 101–2. 2009.
- Singh GK, Hiatt RA. Trends and disparities in socioeconomic and behavioural characteristics, life expectancy, and cause-specific mortality of native-born and foreign-born populations in the United States, 1979–2003. *Int J Epidemiol* 35(4):903–19. 2006.
- Bray F, Jemal A, Grey N, Ferlay J, Forman D. Global cancer transitions according to the Human Development Index (2008–2030):

- A population-based study. *Lancet Oncol* 13(8):790–801. 2012.
11. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 68(6):394–424. 2018.
 12. Youlten DR, Cramb SM, Dunn NA, Muller JM, Pyke CM, Baade PD. The descriptive epidemiology of female breast cancer: An international comparison of screening, incidence, survival and mortality. *Cancer Epidemiol* 36(3):237–48. 2012.
 13. Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-Tieulent J, Jemal A. Global cancer statistics, 2012. *CA Cancer J Clin* 65(2):87–108. 2015.
 14. John EM, Phipps AI, Davis A, Koo J. Migration history, acculturation, and breast cancer risk in Hispanic women. *Cancer Epidemiol Biomarkers Prev* 14(12):2905–13. 2005.
 15. Engelman KK, Cupertino AP, Daley CM, Long T, Cully A, Mayo MS, et al. Engaging diverse underserved communities to bridge the mammography divide. *BMC Public Health* 11:47. 2011.
 16. Lubetkin EI, Zabor EC, Brennessel D, Kemeny MM, Hay JL. Beyond demographics: Differences in patient activation across new immigrant, diverse language subgroups. *J Community Health* 39(1):40–9. 2014.
 17. Brown WM, Consedine NS, Magai C. Time spent in the United States and breast cancer screening behaviors among ethnically diverse immigrant women: Evidence for acculturation? *J Immigr Minor Health* 8(4):347–58. 2006.
 18. Alexandraki I, Mooradian AD. Barriers related to mammography use for breast cancer screening among minority women. *J Natl Med Assoc* 102(3):206–18. 2010.
 19. Endeshaw M, Clarke T, Senkomago V, Saraiya M. Cervical cancer screening among women by birthplace and percent of lifetime living in the United States. *J Low Genit Tract Dis* 22(4):280–7. 2018.
 20. Jemal A, Ward E, Thun MJ. Recent trends in breast cancer incidence rates by age and tumor characteristics among U.S. women. *Breast Cancer Res* 9(3):R28. 2007.
 21. Wun LM, Feuer EJ, Miller BA. Are increases in mammographic screening still a valid explanation for trends in breast cancer incidence in the United States? *Cancer Causes Control* 6(2):135–44. 1995.
 22. U.S. Preventive Services Task Force. Screening for breast cancer: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med* 151(10):716–26. 2009.
 23. Botman SL, Moore TF, Moriarity CL, Parsons VL. Design and estimation for the National Health Interview Survey, 1995–2004. *National Center for Health Statistics. Vital Health Stat* 2(130). 2000.
 24. Parsons VL, Moriarity C, Jonas K, Moore TF, Davis KE, Tompkins L. Design and estimation for the National Health Interview Survey, 2006–2015. *National Center for Health Statistics. Vital Health Stat* 2(165). 2014.
 25. Nelson HD, Tyne K, Naik A, Bougatsos C, Chan BK, Humphrey L. Screening for breast cancer: An update for the U.S. Preventive Services Task Force. *Ann Intern Med* 151(10):727–37. 2009.
 26. U.S. Preventive Services Task Force. Breast cancer: Screening. 2016. Available from: <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/breast-cancer-screening1>.
 27. National Center for Health Statistics. 2015 National Health Interview Survey (NHIS) public use data release: Survey description. Hyattsville, MD. 2016. Available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2015/srvydesc.pdf.
 28. O'Malley AS, Kerner J, Johnson AE, Mandelblatt J. Acculturation and breast cancer screening among Hispanic women in New York City. *Am J Public Health* 89(2):219–27. 1999.
 29. Mandelblatt JS, Gold K, O'Malley AS, Taylor K, Cagney K, Hopkins JS, Kerner J. Breast and cervix cancer screening among multiethnic women: Role of age, health, and source of care. *Prev Med* 28(4):418–25. 1999.
 30. Gorman BK, Read JG, Krueger PM. Gender, acculturation, and health among Mexican Americans. *J Health Soc Behav* 51(4):440–57. 2010.
 31. Lee S, Nguyen HA, Tsui J. Interview language: A proxy measure for acculturation among Asian Americans in a population-based survey. *J Immigr Minor Health* 13(2):244–52. 2011.
 32. Samuel PS, Pringle JP, James NW 4th, Fielding SJ, Fairfield KM. Breast, cervical, and colorectal cancer screening rates amongst female Cambodian, Somali, and Vietnamese immigrants in the USA. *Int J Equity Health* 8(30). 2009.
 33. U.S. Census Bureau. How the U.S. Census Bureau measures poverty. 2014. Available from: https://www.census.gov/library/visualizations/2014/demo/poverty_measure-how.html.
 34. SAS Institute Inc. SAS/STAT (version 9.3) [computer software]. 2012.
 35. RTI International. SUDAAN (release 11.0.0) [computer software]. 2012.
 36. Sato T, Matsuyama Y. Marginal structural models as a tool for standardization. *Epidemiology* 14(6):680–6. 2003.
 37. Schenker N, Gentleman JF. On judging the significance of differences by examining the overlap between confidence intervals. *The American Statistician* 55(3):182–6. 2001.
 38. Parker JD, Talih M, Malec DJ, Beresovsky V, Carroll M, Gonzalez JF Jr, et al. National Center for Health Statistics data presentation standards for proportions. *National Center for Health Statistics. Vital Health Stat* 2(175). 2017.
 39. Dallo FJ, Kindratt TB. Disparities in vaccinations and cancer screening among U.S.- and foreign-born Arab and European American non-Hispanic white women. *Womens Health Issues* 25(1):56–62. 2015.
 40. Theme Filha MM, Leal MD, Oliveira EF, Esteves-Pereira AP, Gama SG.

- Regional and social inequalities in the performance of Pap test and screening mammography and their correlation with lifestyle: Brazilian National Health Survey. *Int J Equity Health* 15(1):136. 2016.
41. Sabatino SA, Coates RJ, Uhler RJ, Breen N, Tangka F, Shaw KM. Disparities in mammography use among US women aged 40–64 years, by race, ethnicity, income, and health insurance status, 1993 and 2005. *Med Care* 46(7):692–700. 2008.
 42. Oeffinger KC, Fontham ET, Etzioni R, Herzig A, Michaelson JS, Shih YC, et al. Breast cancer screening for women at average risk: 2015 guideline update from the American Cancer Society. *JAMA* 314(15):1599–614. 2015.
 43. Julliard K, Vivar J, Delgado C, Cruz E, Kabak J, Sabers H. What Latina patients don't tell their doctors: A qualitative study. *Ann Fam Med* 6(6):543–9. 2008.
 44. Health Resources and Services Administration, Bureau of Primary Health Care. Public Health Service Act [42 USC 254b], Section 330(b). Available from: <https://www.hrsa.gov/advisorycommittees/shortage/Meetings/20100922/section330mua.pdf>.
 45. Health Resources and Services Administration, Rural Health Information Hub. Federally qualified health centers (FQHCs) and the Health Center Program. Available from: <https://www.ruralhealthinfo.org/topics/federally-qualified-health-centers>.
 46. United States–Mexico Border Health Commission. Border lives: Health status in the United States–Mexico border region. 2010. Available from: <https://www.ruralhealthinfo.org/assets/940-3105/health-status-in-the-united-states-mexico-border-region.pdf>.
 47. Cleveland Clinic. Three reasons why we opened a Hispanic clinic: A new model of patient-centered care. 2015. Available from: <https://consultqd.clevelandclinic.org/3-reasons-why-we-opened-a-hispanic-clinic/>.
 48. Office of Minority Health. State and territorial efforts to reduce health disparities: Findings of a 2016 survey by the U.S. Department of Health and Human Services Office of Minority Health. Washington, DC: U.S. Department of Health and Human Services. 2018. Available from: <https://minorityhealth.hhs.gov/assets/PDF/OMH-Health-Disparities-Report-State-and-Territorial-Efforts-October-2018.pdf>.
 49. Coronado GD, Beresford SA, McLerran D, Jimenez R, Patrick DL, Ornelas I, et al. Multilevel intervention raises Latina participation in mammography screening: Findings from ¡Fortaleza Latina! *Cancer Epidemiol Biomarkers Prev* 25(4):584–92. 2016.
 50. Lairson DR, Kim J, Byrd T, Salaiz R, Shokar NK. Cost-effectiveness of community interventions for colorectal cancer screening: Low-income Hispanic population. *Health Promot Pract* 19(6):863–72. 2018.
 51. Luque JS, Logan A, Soulen G, Armeson KE, Garrett DM, Davila CB, Ford ME. Systematic review of mammography screening educational interventions for Hispanic women in the United States. *J Cancer Educ* 34(3):412–22. 2019.
 52. New York State Department of Public Health. Public health works! 2017. Available from: https://www.health.ny.gov/prevention/public_health_works/.
 53. Myers D, Pitkin J. Assimilation today: New evidence shows the latest immigrants to America are following in our history's footsteps. Washington, DC: Center for American Progress. 2010. Available from: https://cdn.americanprogress.org/wp-content/uploads/issues/2010/09/pdf/immigrant_assimilation.pdf.
 54. National Cancer Institute. Joinpoint Regression Program (Version 4.5.0.1) [computer software]. 2017.
 55. Kim HJ, Fay MP, Feuer EJ, Midthune DN. Permutation tests for joinpoint regression with applications to cancer rates. *Stat Med* 19(3):335–51. 2000.

Table 1. Percent distribution of women aged 50–74, by birthplace: United States, 2005, 2008, 2010, 2013, and 2015

Birthplace	Sample size	Percent of total population	Relative percent among foreign-born women
United States	25,707	86.9	...
Mexico	1,022	2.7	20.4
Caribbean	694	1.7	13.1
Central America	283	0.7	5.4
South America	340	0.9	7.1
Europe	577	2.4	18.3
Central Asia	328	1.1	8.3
Southeast Asia	559	1.8	13.5
South Asia	137	0.6	4.9
Africa and Middle East	182	0.8	5.9
Other	122	0.4	3.3
Total	29,951	100.0	100.2

... Category not applicable

NOTES: The denominator used for analysis is the number of U.S. women aged 50–74. Women born in the United States or born abroad to parents who were U.S. citizens are categorized as U.S. born. If born abroad to parents who were non-U.S. citizens, country of birth, geographic proximity, cultural commonalities, socioeconomic differences and similarities, and sample sizes are used to categorize participants by birthplace. South Asia, also known as the Indian subcontinent, includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Europe includes Russia and former Union of Soviet Socialist Republics areas. Percentages may not add to 100 due to rounding.

SOURCE: NCHS, National Health Interview Survey, 2005, 2008, 2010, 2013, and 2015.

Table 2. Sociodemographic characteristics and health care access and utilization among women aged 50–74, by nativity and percentage of lifetime in United States: National Health Interview Survey, 2005, 2008, 2010, 2013, and 2015

Characteristic	Total		U.S. born		Foreign born		Less than 25% of lifetime in United States		25% or more of lifetime in United States	
	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)
All women	29,951	100.0 (0.0)	25,707	86.9 (0.3)	4,244	¹ 13.1 (0.4)	792	¹ 2.4 (0.1)	3,452	¹ 10.7 (0.3)
Age group										
50–59	13,945	50.4 (0.4)	11,867	49.9 (0.4)	2,078	¹ 53.8 (1.0)	400	¹ 55.2 (2.1)	1,678	¹ 53.5 (1.1)
60–69	11,620	36.8 (0.4)	10,076	37.2 (0.4)	1,544	¹ 34.0 (0.9)	297	35.4 (2.0)	1,247	¹ 33.6 (1.0)
70–74	4,386	12.8 (0.2)	3,764	12.9 (0.3)	622	12.2 (0.6)	95	¹ 9.4 (1.1)	527	12.9 (0.7)
Race and ethnicity²										
Hispanic	3,772	9.3 (0.3)	1,731	4.8 (0.2)	2,041	¹ 38.9 (1.1)	406	¹ 43.5 (2.2)	1,635	¹ 37.8 (1.2)
Non-Hispanic white	19,679	73.6 (0.5)	18,874	80.8 (0.4)	805	¹ 26.0 (1.1)	109	¹ 19.3 (2.1)	696	¹ 27.5 (1.1)
Non-Hispanic black	4,644	11.2 (0.3)	4,299	11.8 (0.3)	345	¹ 7.9 (0.7)	73	¹ 8.8 (1.2)	272	¹ 7.7 (0.8)
Non-Hispanic Asian	1,274	4.2 (0.2)	247	0.8 (0.1)	1,027	¹ 26.5 (1.0)	202	¹ 27.9 (2.0)	825	¹ 26.2 (1.1)
Other or mixed race	582	1.6 (0.1)	556	1.8 (0.1)	26	¹ 0.7 (0.2)	*	*	24	¹ 0.8 (0.2)
Marital status										
Never married	2,816	6.4 (0.2)	2,421	6.4 (0.2)	395	6.4 (0.4)	69	5.8 (0.8)	326	6.5 (0.5)
Currently married or living with partner	14,420	63.4 (0.4)	12,235	62.9 (0.4)	2,185	¹ 66.7 (0.9)	401	63.1 (2.0)	1,784	¹ 67.6 (1.0)
Formerly married	12,570	30.2 (0.3)	10,932	30.7 (0.4)	1,638	¹ 26.9 (0.8)	311	31.1 (1.9)	1,327	¹ 25.9 (0.9)
Education										
Less than high school	4,711	13.6 (0.3)	3,228	11.1 (0.3)	1,483	¹ 30.2 (0.9)	325	¹ 38.3 (2.1)	1,158	¹ 28.5 (0.9)
High school graduate or GED	8,481	29.2 (0.4)	7,557	30.2 (0.4)	924	¹ 22.9 (0.9)	165	¹ 23.2 (1.9)	759	¹ 22.9 (1.0)
Some college	8,879	29.6 (0.3)	8,098	31.2 (0.4)	781	¹ 18.7 (0.8)	109	¹ 13.7 (1.5)	672	¹ 19.8 (0.9)
College degree	7,695	27.6 (0.4)	6,701	27.5 (0.4)	994	28.2 (0.9)	161	24.8 (2.0)	833	28.9 (1.0)
Poverty status³										
Less than 100% of poverty level	4,328	10.2 (0.2)	3,362	9.2 (0.2)	966	¹ 16.7 (0.7)	235	¹ 24.1 (1.9)	731	¹ 15.0 (0.8)
100%–199% of poverty level	5,936	17.1 (0.3)	4,910	16.5 (0.3)	1,026	¹ 21.1 (0.7)	233	¹ 28.5 (2.0)	793	¹ 19.5 (0.8)
200%–399% of poverty level	8,758	29.5 (0.4)	7,574	29.4 (0.4)	1,184	29.9 (0.9)	204	29.8 (2.0)	980	29.9 (1.0)
400% or more of poverty level	10,929	43.2 (0.5)	9,861	44.9 (0.5)	1,068	¹ 32.3 (1.0)	120	¹ 17.6 (2.0)	948	¹ 35.6 (1.1)
Health status										
Excellent or very good	14,465	50.7 (0.4)	12,734	51.7 (0.5)	1,731	¹ 43.6 (1.0)	296	¹ 39.9 (2.1)	1,435	¹ 44.5 (1.1)
Good	9,086	30.2 (0.3)	7,650	29.7 (0.4)	1,436	¹ 34.1 (0.9)	272	¹ 34.4 (2.0)	1,164	¹ 34.0 (1.0)
Fair or poor	6,386	19.1 (0.3)	5,314	18.6 (0.3)	1,072	¹ 22.3 (0.8)	224	¹ 25.7 (1.8)	848	¹ 21.5 (0.9)
Health insurance coverage⁴										
Private	18,598	67.5 (0.4)	16,704	69.8 (0.4)	1,894	¹ 51.8 (1.0)	243	¹ 34.3 (2.2)	1,651	¹ 55.6 (1.1)
Public	5,247	14.3 (0.3)	4,230	13.5 (0.5)	1,017	¹ 19.8 (0.8)	223	¹ 25.5 (1.9)	794	¹ 18.5 (0.8)
Medicare only and Medicare Advantage	3,248	9.5 (0.2)	2,736	9.3 (0.2)	512	¹ 10.6 (0.6)	55	¹ 6.7 (0.9)	457	¹ 11.5 (0.6)
Uninsured	2,775	8.7 (0.2)	1,975	7.4 (0.2)	800	¹ 17.8 (0.8)	264	¹ 33.5 (2.1)	536	¹ 14.3 (0.8)
Usual place of care										
None	2,103	6.6 (0.2)	1,585	5.8 (0.2)	518	¹ 11.8 (0.6)	174	¹ 22.2 (1.8)	344	¹ 9.4 (0.7)
Has a usual place	27,587	93.4 (0.2)	23,897	94.2 (0.2)	3,690	¹ 88.2 (0.6)	613	¹ 77.8 (1.8)	3,077	¹ 90.6 (0.7)

See footnotes at end of table.

Table 2. Sociodemographic characteristics and health care access and utilization among women aged 50–74, by nativity and percentage of lifetime in United States: National Health Interview Survey, 2005, 2008, 2010, 2013, and 2015—Con.

Characteristic	Total		U.S. born		Foreign born		Less than 25% of lifetime in United States		25% or more of lifetime in United States	
	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)	Sample size	Percent distribution (SE)
Visits to health care provider										
None	2,829	9.2 (0.2)	2,213	8.4 (0.2)	616	¹ 14.1 (0.7)	173	¹ 23.2 (1.9)	443	¹ 12.0 (0.7)
1	3,796	12.9 (0.3)	3,172	12.5 (0.3)	624	¹ 15.8 (0.8)	119	14.7 (1.5)	505	¹ 16.1 (0.8)
2 or 3	7,747	27.0 (0.3)	6,637	26.9 (0.4)	1,110	28.0 (0.9)	187	25.1 (1.9)	923	28.6 (1.0)
4 or more	14,984	50.9 (0.4)	13,186	52.2 (0.4)	1,798	¹ 42.1 (0.9)	293	¹ 37.0 (2.0)	1,505	¹ 43.3 (1.1)
U.S. region of current residence										
New England	2,020	5.5 (0.5)	1,812	5.5 (0.5)	208	5.1 (0.6)	33	¹ 3.5 (0.8)	175	5.5 (0.7)
Mid-Atlantic	4,315	16.0 (1.1)	3,499	15.2 (1.0)	816	¹ 20.8 (2.1)	138	18.9 (2.8)	678	¹ 21.3 (2.0)
East North Central	3,860	15.6 (0.7)	3,613	17.0 (0.7)	247	¹ 7.0 (0.9)	51	¹ 8.4 (1.6)	196	¹ 6.8 (0.9)
West North Central	2,499	7.2 (0.4)	2,409	7.9 (0.4)	90	¹ 2.1 (0.3)	24	¹ 3.1 (0.8)	66	¹ 1.8 (0.3)
South Atlantic	4,958	17.9 (0.7)	4,231	18.1 (0.7)	727	16.2 (1.3)	151	18.0 (2.1)	576	¹ 5.7 (1.3)
East South Central	1,868	6.1 (0.3)	1,829	6.9 (0.4)	39	¹ 1.2 (0.3)	*	*	30	¹ 1.2 (0.3)
West South Central	3,295	10.8 (0.5)	2,858	11.0 (0.5)	437	9.8 (0.6)	102	10.7 (1.6)	335	9.6 (0.7)
Mountain	2,538	6.1 (0.3)	2,269	6.2 (0.4)	269	5.6 (0.6)	36	5.3 (1.1)	233	5.7 (0.5)
Pacific	4,598	14.9 (0.4)	3,187	12.4 (0.4)	1,411	¹ 32.1 (2.2)	248	¹ 30.9 (2.2)	1,163	¹ 32.4 (1.4)

* Estimate does not meet NCHS standards of reliability.

¹Significantly different from U.S. born, $p < 0.05$.²Hispanic refers to persons who are of Hispanic or Latino origin and may be of any race or combination of races. Non-Hispanic refers to persons who are not of Hispanic or Latino origin, regardless of race.³Based on family income and family size using the U.S. Census Bureau poverty thresholds for 2004, 2007, 2009, 2012, and 2014.⁴A person is defined as uninsured if he or she did not have any private health insurance, Medicare, Medicaid, state-sponsored or other government-sponsored health plan, or military plan at the time of interview. A person is also defined as uninsured if he or she had only Indian Health Service coverage or had only a private plan that paid for one type of service, such as accidents or dental care. Public health insurance includes persons with Medicaid, dual Medicare and Medicaid enrollment, or military or other government health insurance coverage. Women aged 65 and over with only Medicare coverage including Medicare Advantage plans were placed in a separate category.

NOTES: Estimates are based on household interviews of a sample of the U.S. civilian noninstitutionalized population. Estimates were weighted using the Sample Adult weight. Unless indicated, unknowns for the columns were not included in the denominators when calculating percentages, but they were included in the category of All women. Percentages may not add to 100 due to rounding. Country of birth, number of years residing in the United States, and current age are used to determine nativity and percentage of time in the United States. Women born in the United States or born abroad to parents who were U.S. citizens are categorized as U.S. born. SE is standard error.

SOURCE: NCHS, National Health Interview Survey, 2005, 2008, 2010, 2013, and 2015.

Table 3. Estimates of mammography receipt among women aged 50–74, by birthplace: United States, 2005, 2008, 2010, 2013, and 2015

Birthplace	Ever had a mammogram	Met U.S. Preventive Services Task Force mammography screening recommendations
Unadjusted estimates		Percent (standard error)
United States	94.1 (0.2)	73.0 (0.4)
Mexico	¹ 85.8 (1.5)	¹ 65.1 (2.0)
Caribbean	¹ 87.3 (1.4)	72.3 (2.0)
Central America	93.3 (1.7)	72.6 (3.5)
South America	¹ 89.4 (2.0)	67.3 (3.6)
Africa and Middle East	¹ 86.1 (3.2)	66.2 (4.8)
Central Asia	¹ 82.8 (2.6)	¹ 59.6 (3.5)
Southeast Asia	¹ 89.2 (1.8)	72.8 (2.6)
South Asia ²	¹ 83.7 (3.9)	¹ 60.9 (5.4)
Europe ³	92.4 (1.4)	72.9 (2.4)
Adjusted estimates ⁴		
United States	93.9 (0.2)	72.4 (0.4)
Mexico	93.7 (0.8)	¹ 81.4 (1.4)
Caribbean	91.8 (1.1)	¹ 78.6 (2.0)
Central America	¹ 96.6 (0.9)	¹ 82.8 (2.3)
South America	93.3 (1.5)	74.7 (2.6)
Africa and Middle East	88.4 (2.8)	69.6 (4.4)
Central Asia	¹ 84.1 (2.3)	¹ 61.6 (3.4)
Southeast Asia	¹ 88.8 (1.6)	73.6 (2.2)
South Asia ²	¹ 81.5 (4.0)	¹ 58.4 (5.3)
Europe ³	92.3 (1.3)	72.5 (2.3)

¹Significantly different from U.S.-born women, $p < 0.05$.

²Also known as the Indian subcontinent; includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

³Includes Russia and former Union of Soviet Socialist Republics areas.

⁴Adjusted for age, marital status, income, U.S. region of current residence, education, health status, health insurance coverage, usual place for medical care, and number of doctor visits in the past 12 months.

NOTES: The denominator used for analysis is the number of U.S. women aged 50–74. A mammogram is a radiograph of the breast that can be used to check for breast cancer in women who have no signs or display no symptoms of the disease. The U.S. Preventive Services Task Force recommends screening for breast cancer with mammography every 2 years for women aged 50–74. For women born abroad to parents who were non-U.S. citizens, country of birth, geographic proximity, cultural commonalities, socioeconomic differences and similarities, and sample size are used to categorize participants by birthplace.

SOURCE: NCHS, National Health Interview Survey, 2005, 2008, 2010, 2013, and 2015.

**U.S. DEPARTMENT OF
HEALTH & HUMAN SERVICES**

Centers for Disease Control and Prevention
National Center for Health Statistics
3311 Toledo Road, Room 4551, MS P08
Hyattsville, MD 20782-2064

FIRST CLASS MAIL
POSTAGE & FEES PAID
CDC/NCHS
PERMIT NO. G-284

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

For more NCHS NHSRs, visit:
<https://www.cdc.gov/nchs/products/nhsr.htm>.



National Health Statistics Reports ■ Number 129 ■ October 9, 2019

Suggested citation

Clarke TC, Endeshaw M, Duran D, Saraiya M. Breast cancer screening among women by nativity, birthplace, and length of time in the United States. National Health Statistics Reports; no 129. Hyattsville, MD: National Center for Health Statistics. 2019.

Copyright information

All material appearing in this report is in the public domain and may be reproduced or copied without permission; citation as to source, however, is appreciated.

National Center for Health Statistics

Jennifer H. Madans, Ph.D., *Acting Director*
Amy M. Branum, Ph.D., *Acting Associate
Director for Science*

Division of Health Interview Statistics

Stephen J. Blumberg, Ph.D., *Director*
Anjel Vahratian, Ph.D., M.P.H., *Associate
Director for Science*

For e-mail updates on NCHS publication releases, subscribe online at: <https://www.cdc.gov/nchs/govdelivery.htm>.
For questions or general information about NCHS: Tel: 1-800-CDC-INFO (1-800-232-4636) • TTY: 1-888-232-6348
Internet: <https://www.cdc.gov/nchs> • Online request form: <https://www.cdc.gov/info>
DHHS Publication No. 2020-1250 • CS310396