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## Disparities in Mammography Rate Among Immigrant and Native-Born Women in the U.S.: Progress and Challenges

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### Abstract

Disproportionately low mammography rates among U.S. immigrants have been of persistent concern. In light of policies to increase access to screening, this study identifies differences in factors associated with screening among immigrant and native-born women in 2000 and 2008. Data from immigrant and native-born women aged 40+ years in the 2000 and 2008 National Health Interview Surveys were included in descriptive and multivariate regression analyses. Mammography rates rose from 60.2 to 65.5 % among immigrant women, remaining lower than the 68.9 % rate among native-born in 2008. Among immigrants, short length of residency and lower education were associated with lower screening rates in 2000 but not in 2008, while public insurance coverage was positively associated with screening only in 2008. In contrast to immigrants, among the native-born education and income were associated with mammography receipt in 2008, and in both groups health care access was associated with greater screening rates. Policy initiatives aimed at increasing access to mammography may be positively affecting immigrant screening disparities. Access to primary care and public insurance coverage are likely to be very important in maintaining and furthering improvements in mammography rates.

### Keywords

Mammography; Immigrants; Health care access; Cancer screening

### Introduction

Breast cancer is one of the leading causes of cancer death in American women [1], and regular mammography screening is an effective strategy for early detection that has been associated with significantly reduced mortality [2, 3]. Immigrant women are less likely than native-born to report having a recent mammogram [4–7], as well as to receive repeated mammography screening in accordance with recommended guidelines [6, 8]. This is especially concerning since the number of immigrants has grown rapidly in recent years [9], and they currently comprise over 12 percent of the U.S. population [10]. Over the past

decade progress has been made in increasing screening rates among immigrant women [4], however disparities remain, especially among Blacks and Asians [7, 11–13].

In previous research, a range of factors have been associated with lower likelihood of mammography receipt among immigrant women including shorter length of residence in the U.S. [5, 7, 14, 15], lack of citizenship status [5, 16], lower educational attainment and income [6, 15], and reduced healthcare access [6, 15]. It is not known, however, whether these associations are currently present in light of recent policy changes aimed at increasing access to screening. Healthcare contexts in which mammographic screening behavior takes place are continually changing, and many public health agencies and medical/cancer centers in major immigrant destination cities are taking steps to facilitate the delivery of breast cancer screening service to newcomer populations. These include programs at Memorial Sloan-Kettering Cancer Center, NYU Langone Medical Center, Penn Abramson Cancer Center, UCLA Jonsson Comprehensive Cancer Center, and the University of Chicago Comprehensive Cancer Center, as well as services provided through the National Breast and Cervical Cancer Early Detection Program, which was first implemented in the 1990s [17–22]. Because these programs specifically target recent immigrants, based on evidence that large disparities in breast cancer screening occur in this group [23], the previously observed association between shorter duration of residence and lower rates of screening receipt might be expected to become attenuated over time. Fear of being turned away based on legal status may also be declining since these programs are geared toward welcoming immigrant women, thereby lessening the perception that lack of citizenship is a barrier to screening. Subsidized screening programs such as National Breast and Cervical Cancer Early Detection Program that focus on low-income populations may also facilitate the decoupling of associations between mammography receipt and indicators of SES and healthcare access.

To better understand factors associated with mammography screening receipt, this study analyzes population-based samples of women participating in the National Health Interview Survey (NHIS) in 2000 and 2008. The first research objective is to examine whether differences exist in associations between demographic, socioeconomic, and healthcare-related factors and recent mammography receipt among immigrant women in 2000 and in 2008. Because screening rates among immigrant women continue to lag behind those of other women [4], a second objective is to compare and contrast patterns of association between these factors and recent mammography receipt among immigrant and native-born women in 2008.

## Methods

### Study Population

The National Health Interview Survey [24] is an annual, cross-sectional household survey that collects information on a variety of socio-demographic and health indicators. When weighted, NHIS data can be considered to be representative of the native-born civilian population and immigrants who understand English or Spanish, since survey administration is limited to these two languages. Undocumented immigrants and those speaking other languages are not likely to be fully represented. This study analyzes data from the 2000 and 2008 waves of the NHIS.

The 2000 NHIS interviews were completed for 100,618 individuals from 38,633 households (response rate = 90 %) [25]. The 2008 sample consisted of 74,236 persons living in 28,790 households (response rate = 85 %) [26]. Women aged 40 years or older who were born outside of United States and who answered mammography screening questions were identified in the 2000 and 2008 waves of NHIS and included in the analyses as immigrants. The study sample was comprised of 1,330 and 1,083 immigrant women in two study periods, respectively, and 8,882 and 6,321 native-born women. Sample sizes for subgroups of interest are shown in Table 1.

### Outcome Variable

Rates of mammography receipt within the past 2 years were calculated for immigrants and native-born women at both time points. Having a mammography within the past 2 years or not is used as outcome variable in logistic regression analysis. To determine if mammography was conducted within this interval requires information about the date of or time since the last mammogram as collected by survey questions. Two questions in different formats were asked in the 2000 survey, and an extra question was asked in the 2008 survey. In the 2000, respondents were asked: “When did you have your most recent mammogram?” Respondents could answer by providing the date of their last mammogram or the amount of time since their last mammogram (for example 10 days ago, 8 weeks ago, 15 months ago, or 3 years ago). In 2008, respondents could also answer by choosing time intervals ( 1 year ago, >1 year but 2 years ago, >2 years but 3 years ago, >3 years but 5 years ago, or >5 years ago). In order to study temporal changes in mammography use, we ignored any extra information collected in 2008 to calculate mammogram rates in 2000 and 2008. This ensures the same computational procedures are used across years, and is the procedure followed in previous research on this topic [4].

### Predictor Variables

Demographic characteristics, socioeconomic status, health insurance coverage, and health status are entered as independent variables in the multivariate models (Table 1), with selection based on previous research on access to cancer services [27]. The specific predictor variables included in the models are:

1. Age group: Because mammography rates have been shown to vary by age and be most optimal among women ages 50–64 [4], women were classified into age groups 40–49, 50–64, and 65 years and older.
2. Race/ethnicity: Disparities by race/ethnicity in mammography receipt are of great policy interest generally [28, 29], and specifically among the immigrant population [7, 30]. Women were classified by self-report as either Hispanic, non-Hispanic white, non-Hispanic black, non-Hispanic Asian, American Indian, or Alaska Native.
3. Citizenship status: Women were classified as either U.S. citizens or non-citizens, in view of previous research documenting a screening advantage for citizens [5, 16].
4. Duration of residence in the U.S.: Length of U.S. residence is included as a measure of acculturation. This variable was dichotomized as either <10 years or 10

or more years, based on evidence that a primary component of acculturation, English language proficiency, has been found to increase steadily for the first 10 years of residence and then level off [31].

5. Education attainment: Higher levels of education might be expected to be associated with greater awareness of the need for screening receipt. Educational attainment was categorized in the analyses as either <high school completion, high school graduate, some college, or college graduate.
6. Household income: Higher income levels are likely to facilitate mammography receipt by allowing greater access to healthcare providers and preventive health counseling. Household income as a percentage of the federal poverty level was categorized in the analyses as either <100 %, 100–199 %, 200 %, or unknown.
7. Overall health status: Health problems have been associated with lower likelihood of mammography receipt [32]. In the analyses, health status was categorized as either (a) excellent or very good, (b) good, or (c) fair or poor.
8. Health insurance: Health insurance status has been shown to be associated with both recent and repeated mammography receipt [33]. Health insurance status was classified in the analysis as either private insurance, public insurance, or no insurance.
9. Usual source of care: Having a usual source of care can facilitate preventive services receipt including mammography [34]. Women were categorized as either having or not having a usual source of care.
10. Physician contact in the past 12 months: In addition to a usual source of care, actual visits to providers would be expected to facilitate referrals for mammography. In the analyses two dichotomous variables were included identifying whether or not women had talked to a general physician or to an obstetrician/gynecologist (OB/GYN) in past 12 months.

### Statistical Analysis

Population-based mammography rates expressed as percentages were calculated, adjusting for survey design using information on weights, strata, and cluster provided by the NHIS. Estimates of mammography rates were standardized to the 2000 US population by 5-year age groups. Demographic and healthcare access characteristics among immigrant women are also shown in Table 1. Multivariate logistic regression analyses adjusted for survey design were conducted to determine factors associated with mammography receipt among immigrant and native-born women. Participants in NHIS strata containing only one cluster were omitted in regression analyses to reflect the variance estimate in PROC SURVEYLOGISTIC. Odds ratios and 95 % confidence intervals computed from the regression estimates are shown in Table 2. All analyses were conducted using SAS version 9.2 statistical software.

This study has been certified exempt by the Institutional Review Board at the Pennsylvania State University.

## Results

The first two rows of Table 1 display age-adjusted mammography rates among immigrant and native-born women in 2000 and 2008. Overall, mammography rates rose from 60.2 % in 2000 to 65.5 % in 2008 among immigrant women. Their rates remain lower than the rates for native-born women, although the gap narrowed considerably over time, from 11.2 % in 2000 to 3.4 % in 2008. We found that mammography rates were markedly lower among recent immigrants who had been in the U.S. for less than 10 years compared to those who had been in U.S. longer in 2000 (39.3 % versus 64.7 %) (displayed in the third and fourth rows of Table 1). This gap narrowed by 2008 (55.7 % versus 67.9 %), but remained substantial and statistically significant.

Other results of descriptive analyses specific to immigrant women are also shown in the lower section of Table 1. Recent mammography rates among immigrant women varied by many of the demographic and healthcare access characteristics examined. Immigrant women aged 50–64 had much higher mammography rates than women aged 40–49 in both 2000 and 2008. In fact, in 2008 immigrant women aged 50–64 had higher mammography rates than the overall rate among native-born women. Non-Hispanic White and non-Hispanic Black immigrants had higher mammography rates than Hispanic immigrants in 2000 but not in 2008. Immigrants with U.S. citizenship status also had significantly higher mammography rates than non-citizen immigrants in 2000 but not in 2008. Immigrants without a high school education had the lowest mammography rates in both 2000 and 2008. Immigrants with family income over 200 % federal poverty level had significantly higher mammography rates than other lower income groups in 2000, however in 2008 rates by income status were not statistically significantly different. Mammography rates did not vary significantly by self-reported health status in either 2000 or 2008, although rates were lowest among immigrant women reporting fair or poor health. Insured immigrants had higher mammography rates than uninsured immigrants in both 2000 and 2008. Immigrant women who had a usual source of care, who saw/talked a general physician, or who saw/talked to an OB/GYN in past 12 months had higher mammography rates than other immigrant women both in 2000 and 2008.

Results of multivariate logistic regression analyses adjusted for survey design presented in the first column of Table 2 show factors significantly associated with receiving mammography among immigrant women 40 years or older in 2000. Five factors were significantly associated with recent mammography use, holding all other variables constant. The odds that recent immigrants receive timely mammography screening were 53 % lower than the odds for other immigrants. The odds for high school graduates were over twice as high as the odds for women without a high school education. The odds of mammography receipt for immigrant women having private health insurance were 84 % higher than the odds for uninsured immigrant women. The odds for immigrant women who had seen a general physician or OB/GYN in past 12 months were nearly twice and over 5 times higher, respectively, than the odds for immigrant women who had not done so.

In 2008, the patterns of factors significantly associated with mammography use among immigrant women were different in several respects, as seen by comparing the first 2

columns of Table 2. Length of residence in the U.S. and educational level were not significant predictors of recent mammography receipt in 2008, while age and having a usual source of care were significant predictors. Holding all other variables constant, the odds of recent screening for immigrants age 50–64 are 72 % higher than the odds for women age 65 or older in 2008. The association between public insurance and mammography receipt was also significant at the later time point, and the odds for immigrant women having private health insurance or public health insurance were two and a half times and three times as high, respectively, as those for uninsured immigrant women. The odds for immigrant women having a usual source of care were also over twice as high as those for immigrant women who did not have a usual source of care. The odds for immigrant women who have seen/talked to a general physician or OB/GYN in past 12 months were significantly higher than the odds for other immigrant women. Race/ethnicity, citizenship status, poverty status, and self-reported health status were not significant predictors of recent mammography use among immigrant women in 2000 or 2008, once other factors were taken into account.

The factors associated with mammography use among immigrants were similar in many ways to the significant factors for native-born women in 2008, comparing the second and third columns of Table 2. In both groups, better access to health care was associated with higher odds of receiving mammography, although having private insurance and a usual source of care more strongly increased the chances of receiving mammography among immigrant women compared to native-born women. Other factors affecting native-born women's mammography use, including family income level, educational level, and self-reported health status, did not significantly influence immigrants' receipt of mammography. Interestingly, mammography receipt among both native-born and immigrant women did not vary significantly by race/ethnicity once other covariates are controlled.

## Discussion

Disproportionately low rates of breast cancer screening rates among immigrant women in the U.S. have been of persistent concern [5, 7, 15, 30], and have spurred policy efforts to increase access to mammography in this population. In view of these policies, as well as the finding by Breen et al. [4] that screening rates appear to have improved among more recent immigrants, this study sought to examine factors currently associated with mammography receipt among immigrant women and whether these factors differ from those that were important for this group in the past. Our multivariate analyses of NHIS data found that there were indeed differences in screening-related factors in 2008 compared to 2000. Most saliently, longer length of residence in the U.S. and higher education level, which had been associated with greater likelihood of mammography receipt in 2000, were not significantly associated at the more recent time point. Moreover, public insurance coverage, which had not previously been associated with screening receipt, was significantly related in 2008. This parallels changes in legislation that allowed states to offer access to breast cancer-related services through Medicaid [18], and suggests that such coverage is a key component of strategies to improve access to screening.

In 2008, immigrants continued to lag behind in mammography receipt, and to inform the development of tailored interventions for these women a second objective of the present



study was to compare and contrast factors associated with screening among immigrant and native-born women. For the native-born, socioeconomic characteristics including higher income and educational attainment were associated with mammography receipt, however these factors would not currently distinguish those immigrant women who have a greater likelihood of being screened. It was the case that having graduated from high school was significantly associated with screening receipt among immigrants in 2000, but paradoxically higher levels of education were not significantly associated with screening, suggesting that the effect may not have been due to education *per se* but rather some other unmeasured factor associated with having a high school diploma at that point. In 2008, measures of health care access including having a usual source of care and a recent visit to a general physician or Ob/Gyn were important predictors for immigrant women. This finding suggests that mammography rates can be improved by enhancing recent immigrants' primary health care. In order to further improve breast cancer screening rates, medical/cancer center-based immigrant health initiatives may need to reach out to recent immigrants in partnership with community organizations to improve primary care.

Results among immigrant women showing greater mammography receipt among those recent immigrants and a stronger positive impact of public insurance coverage in 2008 suggest that programs and initiatives such as the National Breast and Cervical Cancer Early Detection Program that target these groups may be having a beneficial effect on screening disparities. The possibility exists, however, that other differences besides these initiatives could have influenced the study findings. For example, differences could be present in the national origin and ethnicity of immigrants in the U.S. at the two time points which might influence the results. A report from the Center for Immigration Studies analyzing 2000 and 2010 Census Bureau data, however, indicates that while the absolute numbers of immigrants living in the U.S. have increased, the proportion of the population from each of the top 10 sending countries was very similar at each point [35]. Similarly, the 2000 and 2008 NHIS samples might differ in characteristics that influence the study results. While this possibility cannot be ruled out entirely, it is the case that the racial/ethnic composition of the samples is similar, as is the distribution of preferred language [24].

There are several additional limitations in this study. The NHIS data is self-reported, rather than obtained by objective methods such as medical record review. Prior studies, however, have found good correspondence between objectively determined mammography rates and rates based on self-report [36]. English or Spanish language requirements for participating in the NHIS may have resulted in the exclusion of some groups of immigrant women including recent immigrants and undocumented immigrants who lack preventive health care, and as a result the findings are not likely to be representative of all immigrant women. English/Spanish fluency may also affect the ability of women to understand and accurately respond to the NHIS questionnaire items. Grouping immigrant women together in the multivariate analyses may also have obscured important differences, such as by birthplace and race/ethnic background [30]. For example, some recent studies have explicitly documented variation in cancer screening among US immigrant subpopulations including Blacks, Hispanic, and Asian women [37–40]. An additional limitation relates to lack of data on factors that could potentially impact mammography receipt, such as legal status, country of

origin and related cultural beliefs. Subgroups of immigrant women may have different cultural beliefs that impact their use of mammography in different ways [41]. It should also be borne in mind that there is variation in professional recommendations for mammography screening internationally [42] as well as in the U.S., with the American Cancer Society recommending biennial screening beginning at age 40 [43] and the U.S. Preventive Services Task Force recommending age 50 as the starting point [44].

The above limitations notwithstanding, the study findings suggest several conclusions. First, immigrant women remain less likely than others to receive recommended mammography screening, and initiatives such as the National Breast and Cervical Cancer Early Detection Program that target these groups may be having a beneficial effect on screening disparities. Further evaluation of the impact of such policy interventions among immigrant women is warranted. Second, access to primary care and public insurance coverage are associated with greater likelihood of mammography receipt, among immigrant women as well as the native-born. This suggests that access to primary care and maintaining the availability of such coverage will be very important to efforts to identify breast cancer cases at early stages that are the most successfully treated. Finally, differences in the pattern of factors associated with mammography receipt among immigrant and native-born women suggest that tailored interventions are needed. Focusing solely on low SES as an indicator of risk may fail to identify substantial numbers of immigrant women in need of mammography screening.

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**Table 1**

Percentage of Women aged 40 years who had a Mammogram within the past 2 years according to selected characteristics, National Health Interview Survey, 2000 and 2008

	<u>2000</u>		<u>2008</u>	
	Total unweighted sample	Weighted age-adjusted % who had a Mammogram in past 2 years	Total unweighted sample	Weighted age-adjusted % who had a Mammogram in past 2 years
Native-born	8,882	71.4	6321	68.9
Immigrants	1,330	60.2***	1,083	65.5***
Rates by characteristics among immigrant women				
Immigration status				
Less than 10 years	180	39.3***	130	55.7**
10 years or more	1,040	64.7	942	67.9
Age (years) <sup>a</sup>				
40–49	538	53.0	387	59.7
50–64	409	67.7***	370	74.3***
65 and older	383	60.8	326	61.4
Race/ethnicity				
Hispanic	747	57.1**	518	63.2
Non-Hispanic white	330	67.0	226	67.1
Non-Hispanic black	105	67.5	85	67.3
Non-Hispanic Asians, AIAN, and other	148	56.3	250	66.4
Citizen				
Yes	843	64.4**	674	69.2
No	477	51.6	405	60.1
Education				
< High school	570	51.0***	349	57.1***
Only high school	280	70.0	233	62.7
Some college or AA degree	245	65.5	222	72.2
College graduate (BS/BA)	215	62.1	261	73.4
Family income				
< 100 % of FPL	249	57.1	173	56.8
100–199 % FPL	296	51.4	230	60.8
200 % FPL	463	67.4*	526	69.5
Unknown	322	56.8	154	58.4
Health status				
Excellent/very good	617	61.8	507	65.4
Good	393	60.0	358	66.4
Poor/fair	320	55.9	217	59.3
Insurance <sup>b</sup>				

	<u>2000</u>		<u>2008</u>	
	Total unweighted sample	Weighted age-adjusted % who had a Mammogram in past 2 years	Total unweighted sample	Weighted age-adjusted % who had a Mammogram in past 2 years
No insurance	285	25.8***	240	44.6***
Public	481	67.1	338	68.4
Private	534	72.6	504	77.0
Have a usual source of care <sup>c</sup>				
Yes	1,084	66.5*	902	73.6**
No	50	56.5	61	45.5
Saw/talked to general physician in past 12 months				
Yes	939	68.4***	783	71.7***
No	390	40.7	300	49.6
Saw/talked to Ob/Gyn in past 12 months				
Yes	517	84.2***	367	85.2***
No	812	45.6	714	55.8

Asterisks refer to significant differences in estimates by category at that time point

Most rates were standardized to the projected 2000 US population by 10 age groups (40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85+)

<sup>a</sup> Estimates for the age-group variable were not age-adjusted

<sup>b</sup> Rates for 2,000 were standardized to the projected 2,000 US population by 6 age groups (40–44, 45–49, 50–54, 55–59, 60–64, 65+)

<sup>c</sup> Rates for 2008 were standardized to the projected 2000 US population by 6 age groups (40–44, 45–49, 50–54, 55–59, 60–64, 65+)

\*  $p < 0.05$  level.

\*\*  $p < 0.01$ ,

\*\*\*  $p < 0.001$

**Table 2**

Odds ratios and 95 % confidence intervals for predictors of receiving mammography within the last 2 years among women age 40 or older, National Health Interview Survey, 2000 and 2008

	<b>Immigrant</b>		<b>Native-Born</b>
	<b>NHIS 2000 OR (95 % CI)</b>	<b>NHIS 2008 OR (95 % CI)</b>	<b>NHIS 2008 OR (95 % CI)</b>
Sample <i>N</i> <sup>a</sup>	1,109	943	5,860
<b>Characteristics</b>			
Age (years)			
40–49	0.70 (0.43–1.16)	0.79 (0.47–1.31)	0.60*** (0.49–0.73)
50–64	1.53 (0.95–2.47)	1.72* (1.01–2.92)	1.44*** (1.19–1.73)
65 and older	1.00 (reference)	1.00 (reference)	1.00 (reference)
Race/ethnicity			
Hispanic	1.00 (reference)	1.00 (reference)	1.00 (reference)
Non-Hispanic white	1.07 (0.68–1.68)	0.77 (0.47–1.28)	1.03 (0.79–1.54)
Non-Hispanic black	0.96 (0.50–1.82)	0.93 (0.41–2.11)	1.30 (0.96–2.02)
Non-Hispanic Asians, AIAN, and other	0.67 (0.39–1.15)	0.74 (0.45–1.22)	0.86 (0.53–1.73)
Immigration status			
10 years or more	1.00 (reference)	1.00 (reference)	N/A
Less than 10 years	0.47** (0.27–0.82)	0.60 (0.31–1.18)	
Unknown	0.60 (0.32–1.12)	0.95 (0.17–5.50)	
Citizen			
Yes	1.05 (0.71–1.56)	1.18 (0.75–1.87)	N/A
No	1.00 (reference)	1.00 (reference)	
Education			
< High school	1.00 (reference)	1.00 (reference)	1.00 (reference)
Only high school	2.26* (1.37–3.75)	1.28 (0.73–2.26)	1.53*** (1.23–1.90)
Some college or AA degree	1.41 (0.85–2.33)	1.72 (0.97–3.07)	1.51*** (1.20–1.90)
College graduate (BS/BA)	1.17 (0.65–2.10)	1.72 (0.95–3.13)	2.12*** (1.62–2.77)
Family income			
< 100 % of FPL	1.00 (reference)	1.00 (reference)	1.00 (reference)
100 %–199 % FPL	0.73 (0.42–1.27)	1.61 (0.78–3.35)	1.13 (0.86–1.51)
200 % FPL	0.90 (0.50–1.61)	1.20 (0.59–2.43)	1.66*** (1.28–2.18)
Unknown	0.72 (0.40–1.27)	1.21 (0.56–2.63)	1.31 (0.97–1.77)
Health status			
Excellent/very good	1.00 (reference)	1.00 (reference)	1.00 (reference)
Good	1.00 (0.66–1.53)	1.10 (0.70–1.72)	0.78** (0.66–0.93)
Poor/fair	0.99 (0.62–1.58)	0.86 (0.49–1.50)	0.63*** (0.50–0.76)
Insurance			
No insurance	1.00 (reference)	1.00 (reference)	1.00 (reference)
Private	1.84* (1.08–3.14)	2.56** (1.41–4.64)	1.50* (1.09–2.06)

	<b>Immigrant</b>		<b>Native-Born</b>
	<b>NHIS 2000 OR (95 % CI)</b>	<b>NHIS 2008 OR (95 % CI)</b>	<b>NHIS 2008 OR (95 % CI)</b>
Public	1.49 (0.85–2.59)	1.97* (1.05–3.71)	1.86*** (1.33–2.59)
Have a usual source of care			
Yes	1.41 (0.64–3.10)	2.22* (1.10–4.46)	1.70** (1.22–2.35)
No	1.00 (reference)	1.00 (reference)	1.00 (reference)
Saw/talked to general physician in past 12 months			
Yes	1.98*** (1.33–2.96)	1.63* (1.02–2.60)	1.90*** (1.56–2.29)
No	1.00 (reference)	1.00 (reference)	1.00 (reference)
Saw/talked to Ob/Gyn in past 12 months			
Yes	5.36*** (3.72–7.72)	3.60** (2.30–5.62)	3.43*** (2.87–4.14)
No	1.00 (reference)	1.00 (reference)	1.00 (reference)

<sup>a</sup>The sample size for immigrant women is smaller than the sample size in Table 1 because this multivariate analysis omitted stratum in the NHIS with only one cluster. The sample size for native-born women is smaller than the sample size in Table 1 because observations were deleted due to missing values for the predictor variables, the strata, or cluster variables

\*  $p < 0.05$ ,

\*\*  $p < 0.01$ ,

\*\*\*  $p < 0.001$