

## The roles of citizenship status, acculturation and health insurance in breast and cervical cancer screening among immigrant women

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### **Abstract:**

Background: Immigrant women are less likely to undergo cancer screening. However, few national studies have examined the role of citizenship status or acculturation. Objective: The objective of this study was to examine differences in Papanicolaou (Pap) smear and mammography screening among U. S.-born women and immigrants who are naturalized citizens or remained noncitizens. Among Latinas, we also determined if acculturation is related to screening after adjusting for covariates. Research Design: The authors conducted a cross-sectional analysis of the Adult Section of the 2000 National Health Interview Survey, a nationally representative sample. Subjects: A total of 18,342 women completed the survey, including 1445 who were not citizens. Measures: For Pap smears, women age 18-65 were appropriately screened if they reported testing within the past 3 years. For mammograms, women age 50-70 were considered appropriately screened if they reported testing within the past 2 years. We determined acculturation using a modified version of the Marin scale. Results: After adjusting for age, education, family income, and marital status, noncitizens remained significantly less likely to report having a mammogram than U. S.-born women (14 percentage point difference;  $P < 0.01$ ). However, after adjusting for health insurance coverage and a usual source of care, these disparities were markedly attenuated. For Pap smears, after adjusting for sociodemographics and access to care, disparities persisted (11 percentage points,  $P < 0.01$ ). Among Latinas, differences in Pap smears between noncitizens and the U. S.-born disappeared after further controlling for acculturation. Conclusions: Our study suggests that initiatives to diminish disparities in screening should prioritize improving access to care for noncitizens. Our study also lends support to culturally sensitive interventions aimed at improving Pap smear screening among noncitizens.

**Keywords:** acculturation | Hispanic-Americans | Emigration & Immigration | mammography | vaginal smears

### **Article:**

In 2003, there were 33.5 million foreign-born persons residing in the United States accounting for 11.7% of the population.<sup>1</sup> Among ethnic groups, nearly one-third of Latinos and two thirds of Asians in the United States are foreign-born.<sup>1</sup> Although the Healthy People 2010 goal of eliminating disparities in Papanicolaou (Pap) smear and mammography screening among blacks versus non-Hispanic whites (NHWs) has been achieved,<sup>2,3</sup> equitable access to cancer screening remains a problem for immigrant women.<sup>4-8</sup>

Although a growing body of evidence suggests that immigrants are less likely to undergo cancer screening,<sup>4-8</sup> few studies have examined the role of citizenship status. Noncitizens are a particularly vulnerable group. For example, nearly half of immigrants who are not U.S. citizens lack health insurance coverage.<sup>9</sup> They are also less likely to have a usual source of care and, even when insured, are less likely to access ambulatory services.<sup>10</sup>

The role of acculturation on cancer screening also remains unclear. Acculturation is a multidimensional concept that is intended to reflect complex processes of adaptation between groups of different cultural backgrounds.<sup>11</sup> Although some studies among Latinos suggest that acculturation is positively associated with healthcare utilization<sup>12</sup> and cancer screening,<sup>13</sup> others have found that such relationships are not consistent and vary depending on the measure used and the preventive service examined.<sup>14-16</sup> In addition, few nationally representative studies have examined whether acculturation remains associated with screening after adjusting for sociodemographic variables and access to care.

To address these gaps in knowledge, the aim of this study was to describe differences in Pap smear and mammography resulting from citizenship status using a nationally representative sample of women. We hypothesized that after adjusting for potential confounders, noncitizens would remain less likely to receive cancer screening than naturalized citizens or U.S.-born individuals. Because of the mixed findings on acculturation, we also examine if acculturation is related to screening among immigrant Latinas after adjusting for covariates.

## **Methods**

### **Data Source**

We analyzed data from the 2000 National Health Interview Survey's (NHIS) Sample Adult Section.<sup>17</sup> The NHIS is an annual personal interview household survey that collects data on various sociodemographic and health indicators. The survey is a representative sample of the civilian noninstitutionalized population in the United States. Black and Latino populations are oversampled and the survey is conducted in either English or Spanish. The 2000 sample consisted of 100,618 individuals from 38,633 households with a response rate of 90%. In addition, one randomly selected individual from each household completed the adult section having questions on cancer screening (32,374 respondents, response rate = 83%).

### **Dependent Variables**

Our analysis focuses on Pap smear and mammography screening as the outcome measures. Based on clinical guidelines, we defined women 18-65 years of age, who had not undergone a hysterectomy, as recently screened if they had a Pap test done within the past 3 years.<sup>18</sup> For mammography screening, we focused on women 50-70 years of age and defined women as recently screened if they reported having had a mammogram within the past 2 years.<sup>19</sup>

## Independent Variables

We used the model on equitable access to cancer services proposed by Mandelblatt<sup>20</sup> as a guide for the present study. This model is based on Anderson's<sup>21</sup> and Aday's<sup>22</sup> model of access to health care. Citizenship status is a characteristic of the individual and also one in which the healthcare system can facilitate or hinder an individual's ability to obtain needed medical care. Thus, in our model, we considered citizenship to fall under both the "patient" and "Medical care environment/context" domains. In the NHIS, all study participants were asked to report their citizenship status (approximately 90% of immigrants disclosed this information).<sup>17</sup> Immigrants who became U.S. citizens are considered naturalized citizens. Immigrants who have not become U.S. citizens are noncitizens.

To determine how to best fit our covariates in the multivariate models, we examined their distribution among the subsamples analyzed for each of the study outcomes. For example, for Pap smear screening, we coded age as a categorical variable because it was not linearly distributed. However, for mammography screening, age was kept as a continuous variable. Marital status, education, family income, health insurance, and usual source of care were coded as listed in Table 1.

**Table 1.** Characteristics of U.S.-Born and Immigrant Women Residing in the United States

	<b>U.S.-Born (n = 15,443)</b>	<b>Naturalized (n = 1454)</b>	<b>Noncitizen (n = 1445)</b>
U.S. population (millions)	91.2	6.8	6.8
Age*			
18-35	32	26	52
36-45	21	23	25
46-55	18	18	12
56-65	12	12	6
≥65	17	17	5
Education*			
Less than high school	15	25	41
Only high school	33	24	21
Some college	30	26	20
College or more	22	26	19
Annual family income*			
<\$20,000	23	26	32
>\$20,000	78	74	68
Race/ethnicity*			
Non-Hispanic white	81	31	19
Non-Hispanic black	13	8	7
Latino/Hispanic	10	39	53
Asia/other	1	21	21
Marital status*			
Married/live as married	55	55	61
Not married	45	45	39

Health insurance*			
Private insurance	64	59	44
Public insurance	24	27	13
No insurance	12	14	14
Type of source of care*			
Private office	75	68	47
Clinic/hospital	16	20	26
No usual source of care (includes emergency room)	9	12	28

\*  $p < 0.01$  for  $\chi^2$  across categories.

One of the strengths of the 2000 NHIS Sample Adult File is that all respondents who self-identified as Hispanic were administered 8 questions on language preference as a measure of acculturation.<sup>17</sup> These items were based on the validated short acculturation scale originally developed by Marin et al.<sup>23-25</sup> Consistent with other studies,<sup>26,27</sup> we created a total acculturation score by summing across the responses to the 8 questions with higher mean score indicating increasing level of acculturation (score range of 8-40). Based on the sample distribution, we categorized the scores into tertiles with the lower scores representing those least acculturated.

## Data Analysis

We used SUDAAN to compute population and variance estimates adjusted for survey design and nonresponse.<sup>28,29</sup> We used  $\chi^2$  statistics to test for differences in characteristics among the U.S.-born women, naturalized citizens, and noncitizens. We then used logistic regression models to examine adjusted differences in cancer screening. In the first model, we adjusted for differences in sociodemographic characteristics. In the second set of models, we also adjusted for differences in access to care (health insurance and usual source of care). Finally, in analyses restricted to Latinas, a third set of models examined whether acculturation accounted for any remaining differences. To obtain the adjusted proportion of U.S.-born, naturalized citizen, and noncitizen women having mammography and Pap smears, we used SUDAAN's "predicted marginal" statement.<sup>28</sup>

## Results

### Sociodemographic Characteristics

The 18,342 female respondents who completed the Sample Adult Module represented 105 million women living in the United States. Sixteen percent of these respondents were immigrants, half of whom were noncitizens. Noncitizens were younger, less educated, and were more likely to lack insurance coverage and a usual source of care than both U.S.-born women and naturalized citizens (Table 1). Furthermore, 44% of noncitizens had no health insurance coverage compared with 14% and 12%, respectively, of naturalized citizens and U.S.-born women.

### Mammography Screening

As shown in Table 2, naturalized citizens and noncitizens were significantly less likely to receive mammography than U.S.-born women, with the largest differences between noncitizens and U.S.-born women (21 percentage point difference;  $P < 0.01$ ). After adjusting for age, education,

family income, and marital status (model 1), noncitizens remained significantly less likely to report having a mammogram than U.S.-born women (14 percentage point difference;  $P < 0.01$ ). However, after adjusting for health insurance coverage and a usual source of care (model 2), disparities in mammography between noncitizens and the U.S.-born women were markedly attenuated (7 percentage point difference) and were no longer statistically significant.

**Table 2.** Unadjusted and Adjusted Percentage of Adult Women Reporting Receipt of Papanicolaou (Pap) Smear and Mammography Screening by Citizenship Status

	All Women		Latina Women Only	
	Pap Smear	Mammography	Pap Smear	Mammography
Unadjusted	n = 11,673	n = 4421	n = 2261	n = 553
US-born	87	79	82	73
Naturalized	82*	73*	84	74
Noncitizen	71 <sup>†</sup>	58 <sup>†</sup>	70 <sup>†</sup>	52*
Model 1 <sup>‡</sup>	n = 11,141	n = 4112	n = 2159	n = 503
US-born	87	78	83	72
Naturalized	81 <sup>†</sup>	75 <sup>‡</sup>	82	75
Noncitizen	72 <sup>†b</sup>	64 <sup>†</sup>	70 <sup>†</sup>	58
Model 2 <sup>§</sup>	n = 11,103	n = 4098	n = 2151	n = 501
US-born	87	78	81	70
Naturalized	81 <sup>†</sup>	76	81	73
Noncitizen	76 <sup>†</sup>	71	73 <sup>†</sup>	67
Model 3 <sup>¶</sup>			n = 2151	n = 501
US-born			78	66
Naturalized			81	73
Noncitizen			77	72

\*  $P < 0.05$  for comparison to U.S.-born women

<sup>†</sup>  $P < 0.01$  for comparison to U.S.-born women.

<sup>‡</sup> Model 1: analysis adjusted for age, education, family income, and marital status.

<sup>§</sup> Model 2: analysis adjusted for variables in model 1 plus insurance coverage and having a usual source of care.

<sup>¶</sup> Model 3: analysis adjusted for variables in model 2 plus level of acculturation.

To further examine the role of access to care on differences in mammography between U.S.-born and immigrant women, we performed analyses stratified by insurance coverage (data not shown). In these analyses, mammography use was nearly identical among U.S.-born women and naturalized citizens with public, private, or no health insurance coverage. In contrast, U.S.-born women with private insurance were more likely to be screened than noncitizens with private coverage (84% vs. 68%,  $P < 0.05$ ). However, after adjusting for other covariates, an interaction term for this relationship was not statistically significant. Among women with public coverage, screening was similar in both groups, 74% for U.S.-born women versus 77% for noncitizens. Lastly, among the uninsured, U.S.-born women tended to have greater screenings than immigrant noncitizens (50% vs. 40%). As a result of a smaller sample size, this 10 percentage point difference was not statistically significant.

### Papanicolaou Test Screening

Table 2 shows that naturalized citizens were slightly less likely to receive Pap smear screening than U.S.-born women (5 percentage point difference,  $P < 0.05$ ). This difference persisted after adjusting for sociodemographics and access to care. Much larger differences were noted between noncitizens and U.S.-born women (16 percentage points in the unadjusted analysis,  $P < 0.01$ ).

Adjusting for sociodemographics, insurance status and usual source of care (model 3) slightly attenuated this difference. (11 percentage points,  $P < 0.01$ ).

#### Analyses by Level of Acculturation Among Latina Women

Like in the general population, we found that sociodemographics and access to care in particular accounted for most of the differences in mammography screening between U.S.-born Latinas and noncitizen Latinas. Also similar to the general population, we found noncitizen Latinas were less likely to report Pap smear screening than U.S.-born Latinas, even after adjusting for sociodemographics and access to care variables (8 percentage points,  $P < 0.01$ ). However, the remaining disparities in Pap smear screening between noncitizens and U.S.-born Latinas disappeared after adjusting for level of acculturation (77% vs. 78% ).

### Discussion

In this study, we investigated the effect of citizenship status on cancer screening and found that noncitizens were less likely to report mammography and Pap smear screening than U.S.-born women. For mammography, these disparities disappeared after controlling for health insurance coverage and usual source of care, suggesting that access to care is the primary factor involved in the observed disparities. For Pap test screening, we found that adjusting for demographic, socioeconomic, and access to care measures attenuated but did not eliminate observed differences. Among Latinas, disparities in Pap smears were not evident after further adjustment for acculturation.

Our findings of lower levels of screening among immigrant females are consistent with prior studies.<sup>5-7</sup> A study in California also reported that sociodemographic and access to care characteristics accounted for a large proportion of the observed disparities in mammography among Latina and Chinese women but that disparities in Pap smear screening persisted for both groups even after adjusting for access to care.<sup>4</sup> The importance of access to care in mammography may be related to the fact that this is an expensive procedure usually performed by referral to specialized centers, where verification of source of reimbursement is often needed.

Our finding of the contribution of acculturation in explaining Pap smear screening disparities among Latinas is not surprising. Pap smears are a more personal and invasive procedure that may pose particular cultural barriers and thus can hinder those least acculturated from obtaining services. For example, our prior work has shown that immigrant women are more likely than nonimmigrants to prefer female providers for their gynecologic care.<sup>5</sup> Some studies have not found acculturation to be an independent predictor of Pap smear screening.<sup>4,15</sup> A limitation of these regional studies is that they have used less specific measures of acculturation such as language of interview and length of time in the United States. Additionally, unlike other studies,<sup>15</sup> a strength of our study was that we were able to compare differences between U.S.-born and immigrant Latinas.

Several caveats apply in our study. Immigrants have a wide variety of backgrounds and our findings may not be consistent for all ethnic groups. The fact that our findings were comparable between the sample at large and the subgroup of Latinas is encouraging. However, even the

Latina group is very diverse (eg, Mexican, Cuban, Dominican), and each subgroup may have distinct cultural and historical traditions that can differentially impact cancer health-related behaviors.<sup>30</sup> Our study also used the Marin acculturation scale, which is based on language proficiency. However, prior studies among Mexicans have found that even after adjusting for English proficiency, additional acculturation dimensions such as family attitudes remain positively related to cancer screening.<sup>15</sup> Lastly, the noncitizen group is very diverse and includes persons such as permanent residents, temporary visa holders, refugees, and the undocumented.<sup>31</sup> The latter group accounts for approximately 30% of the immigrant population in the United States and is likely most vulnerable to the disparities we report.<sup>32</sup> For obvious reasons, information on undocumented status is not asked in this federal survey.

In conclusion, our study highlights several important areas of intervention to improve cancer screening among immigrants. First, policy initiatives to diminish disparities in cancer screening should prioritize improving access to care for noncitizens. As an example, initiatives to improve insurance coverage should not discriminate based on citizenship status.<sup>33</sup> In addition, culturally appropriate interventions informing uninsured noncitizens about safety net providers and other programs that provide cancer screening for uninsured women such as the National Breast and Cervical Cancer Early Detection Program<sup>34</sup> could help narrow disparities. Lastly, our study lends support for culturally sensitive interventions to improve Pap smear screening among noncitizens. A promising intervention may be the use of lay community health workers.<sup>35-37</sup>

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