Limited English Proficiency and Breast and Cervical Cancer Screening in a Multiethnic Population

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Objectives. We examined the relationship between ability to speak English and receipt of Papanicolaou tests, clinical breast examinations, and mammography in a multiethnic group of women in the United States.

Methods. We used longitudinal data from the Study of Women Across the Nation to examine receipt of breast and cervical cancer screening among Chinese, Japanese, Hispanic, and White women who reported reading and speaking (1) only a language other than English, (2) another language more fluently than English, or (3) only English or another language and English with equal fluency. Logistic regression was used to analyze the data.

Results. Reading and speaking only a language other than English and reading and speaking another language more fluently than English, were significantly and negatively associated with receipt of breast and cervical cancer screening in unadjusted models. Although these findings were attenuated in adjusted models, not speaking English well or at all remained negatively associated with receipt of cancer screening.

Conclusions. These findings suggest that language barriers contribute to health disparities by impeding adequate health communication. (*Am J Public Health.* 2005;95:1410–1416. doi:10.2105/AJPH.2004.041418)

Racial disparities in health have been documented across all domains of health care for more than 20 years, but the etiologies of these disparities are still not well understood. Racial/ethnic health disparities have been shown to result in part from differences in socioeconomic status, insurance status, type and availability of health care services, patient preferences, and cultural factors.[1] For minorities who do not speak English well or at all, language barriers also probably contribute to poor health communication and consequently to disparities in both health care use and health outcomes.

Language barriers are a potentially important contributor to disparities in breast and cervical cancer among Hispanic and Asian women.[2–4] Although Hispanic and Asian women experience higher cervical cancer incidence and mortality,[5] a greater risk of diagnosis at the later stages of breast cancer, and a greater risk of dying from breast cancer[6] compared with White women, their rates of receipt of Papanicolaou testing (Pap tests), clinical breast examination (CBE), and mammography are lower.[7] Research exploring the reasons for lower rates of breast and cervical cancer screening among Hispanic and Asian women has found that socioeconomic status, health care access factors, and health beliefs and knowledge only partially explain these disparities.[3,8–12]

Language barriers may also play a role in disparities in receipt of screening tests.[2–4,13] Patients who do not speak English well or at all often receive less-than-optimal health care.[1,14] They are less likely to have a regular source of primary care[15,16] and to receive preventive care.[13,16,17] Research specifically examining the relationship between language barriers and preventive care has suggested that language barriers reduce receipt of breast and cervical cancer screening among French, Spanish, and Chinese speakers.[4,13,18] However, none of these studies has examined this relationship longitudinally with control for multiple potential confounding factors in several different ethnic groups.

We explored the relationship between ability to speak English and receipt of Pap tests, CBEs, and mammography among a multiethnic group of women in the United States. Our hypothesis was that women who did not speak English well or at all would be less likely than English-speaking women to report having received breast and cervical cancer screening, and that such an association is independent of other factors (insurance status, race/ethnicity, contact with health care system) found to be associated with reduced receipt of preventive care.

METHODS

Sample

The 1247 women in our sample were participants in the Study of Women's Health Across the Nation (SWAN). A detailed description of the SWAN methods and study design has been published previously.[19] Briefly, SWAN is a prospective, multiethnic, multidisciplinary study of the natural history of the menopausal transition. It is being conducted at 7 US sites: Boston, Chicago, Oakland, Detroit, Los Angeles, Newark, and Pittsburgh. Each site recruited White women and women from 1 other ethnic group: African American, Chinese, Japanese, or Hispanic (including Puerto Ricans, Central Americans, Cubans, South Americans, and Spanish). Sampling strategies and frames varied from site to site and included random-digit dialing, voter registration lists, a health maintenance organization membership list, census tract or block enumeration, and "snowball" sampling techniques.

At least 450 women were initially recruited at each site. Eligibility criteria required participants to be 42–52 years old, to not have received hormone replacement therapy or oral contraceptives during the past 3 months, to have an intact uterus and at least 1 ovary, and to have had a menstrual period during the 3 months prior to entry into the study. We limited our analyses to women who had not had breast, cervical, or uterine cancer and who were enrolled at 1 of the 3 sites that included non–English-speaking participants (Oakland, Los Angeles, and Newark). At study

TABLE 1—Baseline Ethnic and Sociodemographic Characteristics: Study of Women's Health Across the Nation (SWAN), Oakland, Los Angeles, and Newark, 1996–1997

	Language Spoken		
	No English (n = 278)	Another Language More Fluently Than English (n = 66)	Only English, or English and Another Language Equally Well (n = 875)[a]
Race/ethnicity, no. (%)**			
Chinese	44 (16)	37 (56)	159 (18)
Japanese	80 (29)	18 (27)	173 (19)
Hispanic	154 (55)	11(17)	53 (6)
White	0	0	510 (57)
Non-US birth, %**	97	63	23[a]
Education, %**			
Less than a high school diploma	37	17	2
High school diploma	27	30	11
Some college	22	33	30
College degree	13	11	27
Postgraduate	1	6	29
Income in dollars, %**			
< 10 000	19	0	1
10 000–19 000	23	13	4
20 000–34 999	18	29	10
35 000–49 000	14	14	15
50 000–74 999	13	27	23
75 000–99 999	5	11	19
100 000–149 999	5	3	19
≥ 150 000	3	3	9
Insurance, %**			
Private insurance	56	88	91
Medicare or Medicaid	9	0	2
Other	7	6	5
No insurance	28	6	3
Marital status, %*			
Married	82	81	74
Divorced	6	12	11
Separated	7	2	3
Widowed	1	3	1
Single	4	2	11
Money problems, %**			
No problems	74	74	72
Problems, not upsetting	4	14	4
Problems, somewhat upsetting	10	12	17
Problems, very upsetting	12	0	7
Age in years, mean (SD)	46.17 (2.75)	46.35 (2.73)	45.85 (2.74)
Years lived in US, mean (SD)**	17.38 (9.46)	19.28 (8.36)	41.24 (10.33)
Annual no. of hospitalizations, mean (SD)	0.07 (0.37)	0.06 (0.24)	0.05 (0.31)
Annual no. of times spoke to doctor, mean (SD)*	2.61 (3.68)	2.70 (3.60)	3.40 (4.40)

[a] Thirty-four of the 875 participants who spoke only English were born outside the United States.
*$P < .05$; **$P < .01$ (for difference across groups).

entry (1996–1997) and, annually thereafter, women at all sites completed a standard assessment that included interviewer-administered and self-administered questionnaires assessing various social, economic, behavioral, psychological, health, and lifestyle characteristics; in addition, fasting blood and urine specimens were collected. Each site recruited White women and women from 1 other racial/ethnic group: Chinese women in Oakland, Japanese women in Los Angeles, and Hispanic women in Newark. Interviews were conducted in English, Spanish, Cantonese, and Japanese, and questionnaires were available in each of these languages.

Study Variables

Data for our study were obtained from responses to questionnaires administered at baseline and annually through year 5. Data on English language proficiency and all covariates were collected at baseline, and breast and cervical cancer screening data were collected for each of the 5 follow-up years.

Women were asked what language they usually read and spoke: (1) only Spanish, Cantonese, or Japanese; (2) Spanish, Cantonese, or Japanese more fluently than English; or (3) only English or English and Spanish, Cantonese, or Japanese with equal fluency.

Covariate data included sociodemographic variables and 2 measures of health care use (Table 1). Age was measured in years. Race/ethnicity reflected respondents' self-identification: women could identify themselves as Puerto Rican, Mexican or Mexican American, Dominican, Central American, Cuban or Cuban American, South American, Spanish or other Hispanic, Chinese or Chinese American, Japanese or Japanese American, or Caucasian/White non-Hispanic. We collapsed these designations into 4 categories: Hispanic, Chinese, Japanese, and White. Insurance coverage contained 4 categories: private insurance, federal insurance (Medicare or Medicaid), other insurance (including veteran's care), and no insurance. Respondents reported 1 of 5 educational levels, ranging from less than a high school diploma to postgraduate education.

SWAN used 8 categories of reported family annual income, ranging from less than

$10 000 to more than $150 000. Women were also asked whether they had had money problems in the past year and, if they did have money problems, how stressful those problems were (not upsetting, somewhat upsetting, or very upsetting). For marital status, respondents could choose from (married, divorced, separated, widowed, or single). Women were also asked if they were born in the United States and if not, how old they were when they moved to the United States.

These questions were converted into 2 variables, which together formed our measure of acculturation: (1) a binary (0/1) variable indicating whether the woman was born in the United States and (2) a continuous variable reflecting the number of years the woman had lived in the United States. Number of years of US residence was set to zero for women born in the United States. Inclusion of these variables together in the regression models captured both the effect of having been born in the United States vs elsewhere and, for those born elsewhere, the effect of length of time in the United States. Health care use was measured by women's self-report of the number of times they had been hospitalized and the number of times they had seen or talked to a doctor in the past year.

Information on the use of breast and cervical cancer screening was collected via self-report. At each visit, women were asked whether they had had a Pap test, CBE, or mammogram in the past year.

Analysis

The basic analytic framework for this study was logistic regression for the binary outcomes of a Pap test, CBE, or mammogram for each of the 5 follow-up years. Separate analyses were conducted for each of these 3 screening outcomes. Because each woman could contribute up to 5 responses to each analysis, the models were fitted with generalized estimating equations, a methodology tailored for the analysis of longitudinal data.[20] The main predictors of interest were reading and speaking only a language other than English at baseline and reading and speaking another language more fluently than English at baseline. Women in these 2 groups were compared with women who reported speaking only English or speaking English as well as they spoke Chinese, Japanese, or Spanish.

For each outcome, 4 models were fitted. In model 1, we adjusted for baseline age and ethnicity (White vs Chinese, Hispanic, or Japanese, depending on site). In model 2, we added education (coded 1–5), income (coded 1–8), insurance, marital status, and report of money problems (coded 1–4). In model 3, we included annual use of health care in addition to all other covariates. In model 4, we added the 2 measures of acculturation (US nativity and years lived in the United States). Models 2, 3, and 4 were fitted to the data to investigate the direct effect of the covariates on use of screening services and to examine whether adjustment for these variables changed the association between English language proficiency and receipt of screening services.

It is important to note that because there was no language variable for the White group, adjustment for ethnicity has a different meaning in our model than in the standard setting. For example, the Chinese ethnicity variable compared Chinese women who are fluent speakers of English (i.e., those who speak only English or who speak Chinese and English equally well) with White women. The 2 language variables (Chinese only and Chinese more fluently than English) compare Chinese women in these groups with Chinese women who are fluent English speakers. Therefore, the language effects in our models refer only to the effects of language within each ethnic group. For example, Chinese women with no English-speaking ability were compared with Chinese women who speak fluent English. Thus, the English-speaking comparison group did not include White women but instead consists only of English-speaking Chinese women.

Because the data were collected longitudinally so that up to 5 measures per woman were analyzed in our study, we needed to account for correlation among the repeated measures for each woman in the study. We fit our logistic regression models with generalized estimating equations with an exchangeable correlation structure and robust estimates of standard error.[20] This procedure ensured that our regression estimates were reasonably efficient and that our reported standard errors were correct.

Separate sets of logistic models were created for each outcome at each of the 3 sites. These separate sets allowed us to examine how reports of reading and speaking English affected each type of screening within each site and ethnic group. To overcome small sample size in each of our predictor variables at each site, we also pooled the site-specific model fits into an across-site analysis. In both the site-specific and across-site analyses, we also tested the effect of language as a 3-level ordinal variable in each model, in addition to the categorical treatment. Because the results did not differ significantly, we report only the results of the categorical analysis.

In order to conduct an across-site analysis, we accounted for the variability of the SWAN population and study design across the 3 sites. This variability arose from the fact that each site included White women and women from 1 other racial/ethnic group, with 1 site each including Hispanic, Japanese, or Chinese women. The samples from each site had different levels and types of insurance coverage, and the number of women with limited English ability was variable across the sites. As a result, adjustment models took somewhat different forms across the 3 sites. Samples also had different levels and types of insurance coverage. As a result, adjustment models took somewhat different forms across sites. Furthermore, owing to the across-site heterogeneity, the number of women at each site with limited English-speaking ability was variable.

To overcome the challenge of this variability, we took a meta-analytic approach to our data analyses.[21] Specifically, we fitted logistic regression models separately across the 3 sites and then pooled the resulting regression coefficients, obtaining overall estimates of the effects of English-speaking ability and other predictors, with corresponding pooled standard errors for testing this overall association. In pooling, we weighted the pooled coefficients by the inverse of the estimated variance (square of standard error) to maximize statistical efficiency.

TABLE 2—Mean Annual Percentage of Women Reporting Receipt of Papanicolaou (Pap) Testing, Clinical Breast Examination (CBE), and Mammography: Study of Women's Health Across the Nation (SWAN), Oakland, Los Angeles, Newark, 1997–2002

	Language Spoken		
	No English (n = 278)	Another Language More Fluently Than English (n = 66)	Only English, or English and Another Language Equally Well (n = 875)
Pap testing, %	10.83	2.7	41.12
CBE, %	11.83	3.01	54.03
Mammography, %	10.88	2.83	44

RESULTS

Table 1 shows the ethnic and sociodemographic characteristics of the sample. The sample was predominantly English speaking, White, highly educated, middle-class, insured, married, and born in the United States. At baseline, most women had been hospitalized or had seen or talked to a doctor during the previous year, and fewer than 30% had experienced stressful money problems. On average, Chinese, Hispanic, and Japanese women who spoke only English reported more frequently receiving Pap tests, CBEs, and mammograms than Chinese, Hispanic, and Japanese women who reported either not reading or speaking English at all or reading or speaking another language more fluently than English (Table 2). These differences were unlikely to be caused by different screening practices or rates across the 3 sites; the screening rates for Whites were remarkably similar across the sites (Table 2).

The results of the site-specific analyses are shown in Table 3. The association between English language proficiency and each preventive screening measure varied somewhat across the sites. In model 1, at the Oakland site (Chinese ethnic group), speaking and reading only Cantonese was significantly and negatively associated with receipt of Pap testing—but not receipt of the other screening measures—among Chinese women. At the Los Angeles site, speaking or reading Japanese only or more fluently than English was significantly and negatively associated with receipt of Pap testing, CBE, and mammography. At the Newark site, Hispanic women who reported speaking and reading only Spanish were less likely than English-speaking Hispanic women to have had a Pap test or CBE; no effect of language on receipt of mammography was observed. In model 4, the only significant association between English language proficiency and receipt of preventive screening was observed in Los Angeles. Women who reported speaking or reading Japanese only or more fluently than English were significantly less likely than Japanese women who spoke English fluently to have received Pap testing or CBE. Point estimates, however, suggested that the associations between language and breast and cervical cancer screening were clinically important at the other sites as well and that the lack of statistical significance was primarily because of the small sample size.

Table 3 also shows the results of the analysis comparing White women to women in the other 3 racial/ethnic groups who reported speaking English only or another language equally as well as English. In model 1, Chinese women (Oakland site) who spoke English were significantly less likely than White women to report having received all 3 types of breast and cervical cancer screening. After control for all covariates, the only significant association remaining was between women who reported being Chinese and speaking only English or English as well as Chinese and reduced receipt of mammography.

The results of the 3 analyses exploring the relationship between English language ability and receipt of breast and cervical cancer screening in our meta-analysis of data from the 3 sites are shown in Table 4. Because these results combine results from each site, they are automatically adjusted for site. In model 1 (adjusted only for age and ethnicity), a report of not speaking or reading English or of speaking another language more fluently than English significantly reduced the likelihood of receipt of Pap testing or CBE ($P<.01$). A report of not reading or speaking English was associated with reduced likelihood of receipt of mammography ($P<.05$). The associations between English language proficiency and receipt of Pap testing were essentially unchanged after adjustment for age, race/ethnicity, education, income, insurance status, marital status, report of stress due to money problems, hospitalization or contact with a doctor in the previous year, US nativity, and duration of US residence (model 4). After this adjustment, only the negative association between inability to speak English and receipt of CBE remained significant as well. No significant association was found between English language proficiency and receipt of mammography in the fully adjusted model.

DISCUSSION

We found that women who report not reading or speaking English at all, or who report reading and speaking English less well than another language, are less likely to receive breast and cervical cancer screening than are women of the same race/ethnicity who read and speak only English and another language equally well. Furthermore, these differences were not explained by sociodemographic factors, contact with a physician or hospital, US nativity, or number of years residing in the United States. Our findings suggest that communication barriers to adequate health care among women who cannot speak English well contribute to the observed differences in receipt of breast and cervical cancer screening.

Our findings are in keeping with previous literature documenting that patients who do not speak English well or at all are less likely than fluent English speakers to receive optimal health care,[1,14] primary care,[15,16] and preventive care.[13,16,17] Research specifically examining the relationship between breast and cervical cancer screening and speaking French, Spanish, and Chinese exclusively or in preference to English has reported similar results.[4,13,18] Our study expands on previous research by examining this relationship

TABLE 3—Odds Ratios for Receipt of Breast and Cervical Cancer Screening, by Language Spoken, Race/Ethnicity, and Site: Study of Women's Health Across the Nation (SWAN), Oakland, Los Angeles, Newark, 1997–2002

	Receipt of Indicated Screening, OR (95% CI)					
	Oakland[c]		Los Angeles[d]		Newark[e]	
	Model 1[a]	Model 4[b]	Model 1	Model 4	Model 1	Model 4
Papanicolaou testing						
Language spoken						
No English	0.56 (0.36, 0.85)	0.57 (0.31, 1.06)	0.28 (0.19, 0.41)	0.45 (0.25, 0.80)	0.53 (0.36, 0.78)	0.64 (0.38, 1.06)
Another language more fluently than English	0.69 (0.41, 1.14)	0.67 (0.38, 1.19)	0.19 (0.09, 0.41)	0.26 (0.12, 0.58)	0.60 (0.29, 1.26)	0.67 (0.30, 1.51)
Only English, or English and another language equally well	1.00	1.00	1.00	1.00	1.00	1.00
Race/ethnicity[f]						
Chinese	0.56 (0.58, 0.99)	0.78 (0.57, 1.09)				
Japanese			0.86 (0.63, 1.17)	0.93 (0.67, 1.31)		
Hispanic					1.03 (0.65, 1.61)	1.36 (0.72, 2.59)
White	1.00	1.00	1.00	1.00	1.00	1.00
Clinical breast examination						
Language spoken						
No English	0.69 (0.44, 1.08)	0.76 (0.41, 1.41)	0.27 (0.18, 0.39)	0.44 (0.25, 0.79)	0.58 (0.37, 0.88)	0.65 (0.38, 1.10)
Another language more fluently than English	0.76 (0.46, 1.26)	0.79 (0.43, 1.43)	0.20 (0.09, 0.41)	0.30 (0.10, 0.88)	0.84 (0.36, 1.97)	0.90 (0.39, 2.08)
Only English, or English and another language equally well	1.00	1.00	1.00	1.00	1.00	1.00
Race/ethnicity[f]						
Chinese	0.73 (0.55, 0.96)	0.74 (0.53, 1.04)				
Japanese			0.78 (0.57, 1.07)	0.82 (0.59, 1.14)		
Hispanic					0.93 (0.57, 1.52)	1.23 (0.62, 2.44)
White	1.00	1.00	1.00	1.00	1.00	1.00
Mammography						
Language spoken						
No English	1.24 (0.77, 1.99)	1.00 (0.54, 1.87)	0.38 (0.27, 0.55)	0.67 (0.39, 1.17)	0.73 (0.48, 1.11)	0.88 (0.51, 1.50)
Another language more fluently than English	1.08 (0.69, 1.68)	1.01 (0.61, 1.67)	0.36 (0.15, 0.82)	0.60 (0.20, 1.82)	1.19 (0.58, 2.42)	1.38 (0.70, 2.71)
Only English, or English and another language equally well	1.00	1.00	1.00	1.00	1.00	1.00
Race/ethnicity[f]						
Chinese	0.69 (0.53, 0.88)	0.68 (0.50, 0.92)				
Japanese			0.91 (0.69, 1.20)	0.97 (0.72, 1.30)		
Hispanic					1.14 (0.72, 1.82)	1.39 (0.76, 2.52)
White	1.00	1.00	1.00	1.00	1.00	1.00

Note. OR = odds ratio; CI = confidence interval.
[a]Model 1 was adjusted for age and race/ethnicity.
[b]Model 4 was adjusted for age, race/ethnicity, education, income, insurance status, marital status, report of stressful money problems, number of hospitalizations and times spoken to a physician in the past year, US nativity, and years lived in the United States.
[c]Site only recruited White women and Chinese women.
[d]Site only recruited White women and Japanese women.
[e]Site only recruited White women and Hispanic women.
[f]Comparison between White women and women of each ethnic group who report speaking English only or another language equally as well as English.

longitudinally with control for multiple potential confounding factors among racial/ethnic groups. In addition, our study appears to be the first to address this relationship among Japanese women.

English language proficiency was associated with receipt of Pap testing and CBE, but it was not as strongly associated with receipt of mammography. One possible explanation of this finding is that performance of Pap tests and breast examinations is more heavily dependent on adequate communication between a health care provider and a patient than is performance of mammography. To perform Pap tests and breast examinations, the health care provider must ask a woman to undress and place herself in a vulnerable position in his or her office. If a family member or friend is interpreting for the patient in an office setting, as is often the case,[22–24] it is easy to see how patient and provider would be reluctant to participate in an examination of the breasts or genitals. By contrast, mammography is performed at a separate office located away from

TABLE 4—Odds Ratios for Receipt of Breast and Cervical Cancer Screening in Combined Sample, by Language Spoken: Study of Women's Health Across the Nation (SWAN), Oakland, Los Angeles, Newark, 1997–2002

Language Spoken	Receipt of Indicated Screening, OR (95% CI)	
	Model 1[a]	Model 4[b]
Papanicolaou testing		
No English	0.43 (0.34, 0.54)	0.55 (0.40, 0.77)
Another language more fluently than English	0.50 (0.35, 0.72)	0.53 (0.35, 0.79)
Only English, or English and another language equally well	1.00	1.00
Clinical breast examination		
No English	0.44 (0.35, 0.57)	0.60 (0.43, 0.83)
Another language more fluently than English	0.55 (0.38, 0.80)	0.69 (0.44, 1.08)
Only English, or English and another language equally well	1.00	1.00
Mammography		
No English	0.63 (0.50, 0.80)	0.83 (0.60, 1.15)
Another language more fluently than English	0.91 (0.65, 1.28)	1.05 (0.72, 1.53)
Only English, or English and another language equally well	1.00	1.00

Note. OR = odds ratio; CI = confidence interval.
[a]Model 1 was adjusted for age and race/ethnicity.
[b]Model 4 was adjusted for age, race/ethnicity, education, income, insurance status, marital status, report of stressful money problems, number of hospitalizations and times spoken to a physician in the past year, US nativity, and years lived in the United States.

the health care provider's office facility, where family and friends are not permitted.

The fact that we found no significant association between receipt of mammography and the ability to speak English is encouraging. This lack of an association suggests that language barriers are not insurmountable. In this context, again, it is not surprising that mammography is the preventive service least affected by language barriers. Strong efforts have been made by organizations such as Y-ME and the American Cancer Society to increase mammography rates in all ethnic groups, and culturally and linguistically appropriate outreach programs have been developed focused on increasing these rates.[25,26]

This study had limitations. The fact that the sampling strategies and language groups differed by site may have limited our ability to understand the relationship between English language proficiency and receipt of breast and cervical cancer screening. In addition, although we controlled for acculturation by including US nativity and the number of years a woman had lived in the United States, inclusion of these covariates may not have adequately controlled for cultural differences in knowledge and beliefs about breast and cervical cancer screening. However, our site-specific analyses allowed us to examine the relationship within each ethnic group between not reading or speaking English and receipt of preventive services, thus allowing us to partially control for cultural factors, and we still found a significant negative effect.

Our measures of receipt of Pap testing, CBE, and mammography were based on a woman's self-report. A study of self-report of mammography within SWAN and other studies has shown that self-report of preventive screening is a valid measure.[27] In addition, overreporting has been shown to be consistent across ethnic groups.[28] If overreporting of screening occurred in our study, it should be consistent across groups and should not affect our findings. We measured use of Pap testing, CBE, and mammography with an annual follow-up. The appropriateness of the screening interval of each of these measures is difficult to ascertain, given the numerous conflicting screening guidelines available at the beginning of the SWAN study. However, the US Preventive Task Force recommendations of 1996 included mammography every 1 to 2 years for women aged 50 years and older and a Pap test "at least every 3 years" for women aged 21 years and older.[29,30] No recommendation was made for or against routine screening mammography for women aged 40 to 49 years or for CBE, thus leaving this decision up to the individual practitioner.[29,30] As a result, many organizations continued to recommend that these 3 examinations be performed annually for women older than 40 years.

Despite the above limitations, our study suggests that language barriers contribute to reduced receipt of breast and cervical cancer screening. Unfortunately, language barriers are a significant problem. According to the 2000 census, 25% of the US population self-identifies as Hispanic/Latino, Asian American, Native Hawaiian/Pacific Islander, or Native American, and 18% of US residents speak a language other than English as their primary language.[31] It is time to recognize the role that language barriers play in health disparities and to begin to equip health care providers with the kinds of linguistic and interpreter resources they need to overcome these barriers. ■

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Contributors

E. A. Jacobs originated the article's topic, directed the analyses, and interpreted the data and is the primary author of the article. K. Karavolos and P. J. Rathouz were responsible for the analysis and helped to interpret the data. L. H. Powell helped to conceive and supervise the entire SWAN study. T. G. Ferris, along with all the authors, provided critical feedback on the article.

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Human Participation Protection

The SWAN research protocol was approved by an institutional review board at each site, and all women provided written informed consent to participate in the study.

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