Pap Smear Rates Among Haitian Immigrant Women in Eastern Massachusetts

Eric H. Green, MD, MSc[a]
Karen M. Freund, MD, MPH[a]
Michael A. Posner, MS[a]
Michele M. David, MD, MPH, MBA[a]

SYNOPSIS

Objective. Given limited prior evidence of high rates of cervical cancer in Haitian immigrant women in the U.S., this study was designed to examine self-reported Pap smear screening rates for Haitian immigrant women and compare them to rates for women of other ethnicities.

Methods. Multi-ethnic women at least 40 years of age living in neighborhoods with large Haitian immigrant populations in eastern Massachusetts were surveyed in 2000–2002. Multivariate logistic regression analyses were used to examine the effect of demographic and health care characteristics on Pap smear rates.

Results. Overall, 81% (95% confidence interval 79%, 84%) of women in the study sample reported having had a Pap smear within three years. In unadjusted analyses, Pap smear rates differed by ethnicity (p=0.003), with women identified as Haitian having a lower crude Pap smear rate (78%) than women identified as African American (87%), English-speaking Caribbean (88%), or Latina (92%). Women identified as Haitian had a higher rate than women identified as non-Hispanic white (74%). Adjustment for differences in demographic factors known to predict Pap smear acquisition (age, marital status, education level, and household income) only partially accounted for the observed difference in Pap smear rates. However, adjustment for these variables as well as those related to health care access (single site for primary care, health insurance status, and physician gender) eliminated the ethnic difference in Pap smear rates.

Conclusions. The lower crude Pap smear rate for Haitian immigrants relative to other women of color was in part due to differences in (*1*) utilization of a single source for primary care, (*2*) health insurance, and (*3*) care provided by female physicians. Public health programs, such as the cancer prevention programs currently utilized in eastern Massachusetts, may influence these factors. Thus, the relatively high Pap rate among women in this study may reflect the success of these programs. Public health and elected officials will need to consider closely how implementing or withdrawing these programs may impact immigrant and minority communities.

[a]Women's Health Unit, Section of General Internal Medicine, Evans Department of Medicine, Boston University School of Medicine, Boston, MA

Address correspondence to: Eric H. Green, MD, MSc, Dept. of Medicine, Montefiore Medical Center, 111 E. 210 St., Bronx, NY 10467; tel. 718-920-7332; e-mail <ergreen@montefiore.org>.

The incidence of and mortality from invasive cervical cancer in the United States have decreased since the 1970s.[1] However, disparities in mortality from this preventable disease are found when African American or Latina women are compared to non-Hispanic white women.[1–4] These findings may be due to later detection of cervical cancer in minority women. A retrospective review of data from a tumor registry[5] and data from a case series[6] suggest that the burden of cervical cancer is higher in the Haitian immigrant community than in other communities of color. There is some evidence of lower Pap smear rates among women who self-identified as Haitian than among other women of color in New York City;[7] however, little direct research has been done on cervical cancer in the Haitian immigrant community. This reflects the difficulty in studying this community. Haitian immigrants are poorly sampled by large national surveys because of their small numbers and geographical concentration in a few metropolitan areas,[8,9] as well as their inclusion in groups labeled "black" or "African American" in some large databases.[10] Further, many Haitians in the U.S. speak primarily Haitian Creole, requiring additional efforts on the part of survey organizers to make their surveys accessible to this population.

For the present study, we examined Pap smear rates for women living in neighborhoods with substantial Haitian immigrant populations in four cities in eastern Massachusetts. We determined whether Haitian immigrant women had lower screening rates than other women residing in the same neighborhoods and identified the demographic and health care characteristics associated with receipt of screening.

METHODS

We conducted a cross-sectional, community-based survey of women living in four cities in eastern Massachusetts who were 40 years of age or older and spoke English, Haitian Creole, or Spanish. The survey used an area probability sample to identify subjects. We first generated canvass maps of potential survey areas in four eastern Massachusetts cities (Boston, Cambridge, Brockton, and Somerville) using information from community-based agencies, businesses, the city of Boston Assessing Department's Property Parcel Data for fiscal year 1997, and Property Parcel Data for fiscal year 1999 from the Assessing Departments of the cities of Brockton, Cambridge, and Somerville. After consultation with Haitian community leaders, we used these maps to generate, for each of the four cities, an initial list of city blocks where the community leaders believed at least 20% of households included Haitian immigrants. We supplemented this list with city blocks where at least two study participants believed that 20% of households included Haitian immigrants.

Trained multilingual interviewers visited randomly selected households from 2000–2002. In households with multiple eligible women, the youngest woman meeting the eligibility criteria completed the survey. Interviewers visited each household up to four times before it was eliminated from consideration for inclusion in the study and a new household was selected. No more than 12 women were surveyed from any individual city block.

Each participant completed a 30- to 45-minute interviewer-administered survey using a standardized instrument in English, Haitian Creole, or Spanish, according to her preference. The survey included questions on demographics, health care access, and preventive health practices. We adapted questions from the Cancer Control Needs in Multi-Ethnic Communities study,[11] the National Health Interview Survey 1992 epidemiological and cancer control supplements,[12] and a prior survey administered to 332 similar women.[13] We translated all questions from English into Haitian Creole and Spanish and independently back-translated them to English to ensure the accuracy of the initial translation. We piloted the survey with women from diverse cultural backgrounds and revised the questionnaire based on these sessions. The Boston University School of Medicine Institutional Review Board approved all aspects of this study.

Women were asked to self-identify their ethnicity and race. The interviewer first asked, "How would you describe your ethnic group?" Respondents were offered 19 specific response choices as well as "other," "don't know," and "refused." Respondents who indicated "other" were asked for a further description of their ethnicity. A separate question asked about race: "How do you define your race? Would you say you're black; American Indian, Eskimo, and Aleut; Asian or Pacific Islander; white; other race [specify]; don't know; refused."

Women were also asked to specify their country of birth, their mother's and father's countries of birth, their first language, and the country that they "most identif[ied] with."

We grouped women into five major ethnic groups: "Haitian," "African American," "Latina," "English-speaking Caribbean," and "white, not Hispanic," based on self-report. We attempted to classify the 114 (16%) women who reported their ethnicity as "other" or who listed multiple ethnicities into these categories and were able to do so for 76 of the 114 women. We based this categorization on the women's self-reported race and country of origin, with secondary reliance on their parents' countries of origin. For example, one women who self-identified as "black" reported that she had been born in Haiti to Haitian parents and had grown up there speaking Haitian Creole; we classified her as Haitian for the present study.

We grouped annual household income into four categories (<$20,000, $20,000–$40,000, >$40,000, and unknown) and analyzed age groups by decades (40–49 years, 50–59 years, . . . , ≥80 years.). We considered women who reported having had a Pap smear within three years prior to the interview to have had a recent Pap smear.

We performed bivariate analyses using chi-square or Fisher's exact tests, as required, for categorical variables. We used analysis of variance to analyze the relationship of race with age to determine the statistical significance of any age differences between racial/ethnic groups. We constructed two multiple logistic regression models to assess Pap smear rates, controlling for other factors. Our first model adjusted for age and demographic factors known to affect Pap smear rates in other populations (age, marital status, education level, and household income).[14–20] Our second model included all variables in the first study, as well as elements of health care delivery known to influence Pap smear rates (insurance status, physician gender, and single site for primary care).[7,14,15,21] We performed extensive sensitivity analyses to confirm that our findings were not overly dependent

on assumptions in variable definition. All statistical analyses were performed using SAS,[22] and all p-values are two-sided. We defined statistical significance as $p<0.05$.

RESULTS

We identified 2,304 potentially eligible addresses. We excluded 161 (7%) because of vacancy, safety concerns, or because no housing unit existed at that address. At an additional 369 (16%) addresses, no one was available on four separate visits. At 792 (34%) of the households visited, there were no eligible women. A total of 982 eligible women were identified (43% of visited households); of these women, 753 (77%) participated.

Among the 753 participants, 38 (5.0%) could not be classified into one of the five pre-defined ethnic groups, and 15 (2.0%) said they did not know when they had last received a Pap smear or did not answer this question. The remaining 700 women formed our study sample.

The characteristics of the sample are shown in Table 1. Of the 700 women, 278 (40%) were categorized as Haitian, 156 (22%) as African American, 52 (7%) as English-speaking Caribbean, 72 (10%) as Latina, and 142 (20%) as white, not Hispanic.

The Haitian group included 275 women who reported having been born in Haiti and who self-identified as "Haitian" or "Haitian American"; two women who self-identified as Haitian or Haitian American but reported having been born in other Caribbean countries (Dominican Republic, Cuba); and one women (as described above) who did not identify an ethnicity but reported having been born in Haiti to Haitian parents.

Seventy-five percent of the women in the study sample lived in Boston, and 87% reported having some form of health insurance. Most surveyed women had reportedly engaged in preventive health behaviors: 90% reported having had a "check-up visit" within two years, and 68% reported having had a mammogram within one year. Also, 87% reported that someone at their doctor's office, i.e., their health care provider, a member of the support staff, or an interpreter, was available to communicate with them in their first or preferred language.

We found differences in demographic and health care access variables across ethnicities (see Table 2). The Haitian immigrant women were less likely to have graduated from high school than African American, Latina, non-Hispanic white, or English-speaking Caribbean women ($p<0.01$ for each comparison) and were least likely to have health insurance or a female physician. They were also least likely to report that they had access to someone who spoke their language when they saw a physician. Haitian, Latina, and English-speaking Caribbean women were less likely to report their incomes than African American or non-Hispanic white women, thus justifying use of a four-level variable for income. White women were oldest and least likely to be married.

We found that 570 women reported having had a Pap smear within three years (81%; 95% confidence interval [CI] 79%, 84%). Pap smear rates differed by ethnicity ($p=0.003$). Women who identified as Latina, African American, and English-speaking Caribbean women had the highest rates, while women identified as Haitian had a somewhat lower Pap smear rate (78%; 95% CI 74%, 83%), and non-Hispanic white women had the lowest rate (74%; 95% CI 67%, 81%). Characteristics that made Pap smear acquisition more likely included being married or living with a domestic partner, having some form of health insurance, utilizing a single site of health care, and having a female physician (Table 3). Pap smear rates also differed by income and age.

Logistic regression models that adjusted for confounding accounted for much of the difference in Pap smear rates between women of different ethnicities (Table 4). In our models, which sequentially adjusted for demographics and health care delivery variables, the adjusted odds ratios (ORs) for having a recent Pap smear for Haitian women compared to African American women approached 1.0 and had progressively wider CIs. As we adjusted for more confounders, the overall statistical significance associated with ethnicity was progressively reduced ($p=0.003$ unadjusted; $p=0.03$ adjusted for demographics; and $p=0.19$ adjusted for

Table 1. Characteristics of women in study sample (*N*=700 women ≥40 years of age)

Characteristic	n	*Percent*
Ethnic category		
Haitian[a]	278	40
African American	156	22
English-speaking Caribbean	52	7
Latina	72	10
White, not Hispanic	142	20
High school graduate	373	54
Married or living with a domestic partner	337	48
Annual household income		
>$40,000	86	12
$20,000–40,000	155	22
<$20,000	204	29
Unknown	255	36
Health insurance	591	87
Single site for primary care	667	95
Female physician[b]	303	45
Language access[c]	607	87
Lived in Boston	473	75
"Check-up" visit within 2 years	566	91
Mammogram within 1 year	435	69
Age (mean ± standard deviation)	55 ± 12	

[a]Included 275 women who reported having been born in Haiti who self-identified as "Haitian" or "Haitian American," two women who reported having been born in other Caribbean countries (Dominican Republic and Cuba) who self-identified as "Haitian," and one women who did not identify an ethnicity who reported having been born in Haiti to Haitian parents.

[b]n=671 who identified a usual provider.

[c]Physician, nurse, support staff, or translator available at primary care site who spoke first or preferred language.

Table 2. Pap smear rates and selected demographic and health care access characteristics, by ethnicity (*N*=700 women ≥40 years of age)

Characteristic	Haitian (n=278)[a] Percent (95% CI)	African American (n=156) Percent (95% CI)	English-speaking Caribbean (n=52) Percent (95% CI)	Latina (n=72) Percent (95% CI)	White, not Hispanic (n=142) Percent (95% CI)	p-value
Pap smear within past 3 years	78 (74, 83)	87 (81, 92)	88 (80, 97)	92 (85, 98)	74 (67,81)	0.003
High school graduate	24 (20, 30)	80 (75, 87)	67 (54, 80)	46 (34, 57)	80 (73, 86)	<0.001
Married or living with a domestic partner	56 (50, 61)	43 (35, 50)	58 (44, 71)	47 (36, 54)	37 (29, 44)	0.001
Annual family income <$20,000	34 (28, 39)	22 (16, 29)	8 (1, 15)	25 (15, 35)	38 (30, 46)	<0.001
Health insurance	79 (74, 84)	94 (90, 98)	100	84 (76,93)	92 (87, 95)	<0.001
Single site for primary care	94 (92,97)	98 (96,100)	100	97 (93,100)	92 (87, 96)	0.03
Female physician[b]	38 (32, 43)	51 (45, 59)	46 (40, 67)	65 (54, 77)	42 (34, 51)	<0.001
Language access[c]	83 (78, 87)	99 (98, 100)	100	96 (92, 100)	96 (93, 98)	<0.001
Age (mean ± standard deviation)	54 ± 11	55 ± 9	56 ± 11	51 ± 10	61 ± 14	<0.001

[a]Includes 275 women who reported having been born in Haiti who self-identified as "Haitian" or "Haitian American," two women who reported having been born in other Caribbean countries (Dominican Republic and Cuba) who self-identified as "Haitian," and one women who did not identify an ethnicity who reported having been born in Haiti to Haitian parents.

[b]*n*=671 who identified a usual provider.

[c]Physician, nurse, support staff, or translator available at primary care site who spoke first or preferred language.

CI = confidence interval

demographics and health care delivery). Our second model produced a C-statistic (a measure of predictive validity) of 0.74, indicating that it discriminated well between women with and without Pap smears.

Age, physician gender, and insurance were statistically significant predictors of Pap smear acquisition in our final model. In sensitivity analyses, we found no statistically significant interactions between any of these factors and ethnicity. During further sensitivity analyses in which we varied variable definitions, we found that the adjusted ORs varied by less than 10% from those in the base model and the *p*-values for ethnicity were similar to those calculated in the base model.

DISCUSSION

In our population-based sample of multi-ethnic urban women at least 40 years old, self-reported Pap smear rates among all women were relatively high. In the study sample, women identified as Haitian had a lower Pap smear rate than women identified as African American, English-speaking Caribbean, or Latina. Of note, non-Hispanic white women who lived in the same neighborhoods in eastern Massachusetts as Haitian immigrants had a lower crude Pap smear rate than women of color. However, adjustment for differences in demographics and health delivery eliminated the association between ethnicity and Pap smears.

Ethnicity has been reported to be an important predictor of Pap smear acquisition. Multiple data sources suggest that African American women have slightly higher Pap smear rates than non-Hispanic white women.[15,19,23,24] Data from the National Health Interview Survey[16] and the Behavioral Risk Factor Surveillance System (BRFSS) Survey[15] suggest that Latina, Native American, and women classified as "other" have lower Pap smear screening rates than either African American or white women. However, there is little evidence directly comparing Pap smear rates of Haitian immigrant women to those of other black women. Fruchter et al. found the rate of *in situ* cervical carcinoma, which is almost always detected via Pap smears, to be lower in Haitian immigrant women than in other minority women.[25] In a telephone survey of minority and immigrant women completed in 1992 in New York, Mandelblatt and colleagues found that women identified as Haitian had the lowest Pap smear rate (69%) of any group sampled.[11] These data, along with the results of the present study, highlight differences among black populations, and reinforce the need for detailed reporting of race and ethnicity in monitoring the health of minority communities.[10]

Although the 81% Pap smear rate for a three-year period in the present study does not meet the Healthy People 2010 goal for 90% of women at least 18 years old to receive triennial Pap smears,[26] the Pap smear rate is higher than that seen in a recent study of similar low-income minority women.[11] Our data, along with state and local BRFSS data,[27,28] reveal higher Pap rates in Massachusetts and Boston than nationally. These higher rates may be attributed to expanded health care access in this region.[29] The services available in eastern Massachusetts during the study period included both government and non-government programs[30] such as broad Medicaid eligibility requirements, a general insurance "safety net" (the Massachusetts Uncompensated Care Pool),[31] a special program designed to increase cancer screening access (the Massachusetts Department of Public Health's Women's Health Network),[32] and a statutory requirement for translation services at hospital-based medical practices.[33] In addition, the relatively large number of teaching hospitals and community health centers in Boston and Cambridge may increase low-income women of color's access to medical care. The health care environment in eastern Massachusetts accounts for the many women in this study with insurance

Table 3. Self-reported Pap smear rates by selected demographic and health care access variables (*N*=700 women ≥40 years of age)

Characteristic	*Pap smear within past 3 years* *Percent*	*p-value*
Overall	*81*	
Education		0.35
High school graduate	83	
Not high school graduate	80	
Marital status		0.005
Married or living with a domestic partner	86	
Not married	78	
Annual household income		<0.001
>$40,000	94	
$20,000–$40,000	85	
<$20,000	80	
Unknown	76	
Health insurance status		<0.001
Insured	84	
Not insured	65	
Single place of health care		<0.001
Yes	82	
No	55	
Provider gender[a]		<0.001
Female	89	
Male	78	
Age		<0.001
40–49	89	
50–59	84	
60–69	78	
70–79	62	
≥80	53	

[a]*n*=671 who identified a usual provider.

coverage and access to primary care offices where someone spoke their language.

Despite the relatively high overall rates of Pap smear acquisition, disparities still exist. Many studies have found that women are more likely to have had a Pap smear if they are younger, have more education, have higher incomes, or are married.[14–20] Others have found that higher Pap smear rates are associated with health insurance,[14,15] a usual site of care,[7] and a female physician.[21] In our data, the ethnic disparities observed in unadjusted analyses can be explained by ethnic differences in demographic and health delivery variables. Demographic variables such as age, income, education, and marital status are either unmodifiable or unlikely to be affected by public health programs. However, differences in Pap smear acquisition between women of different ethnicities were not eliminated by adjustment for age, income, and education. It was only after adjustment for differential insurance rates, care by a female physician, and use of a single site for primary care that the differences in Pap smear rates were fully explained. This implies that if these factors could be equalized across ethnicities, women of all ethnicities would have Pap rates similar to those seen in the African American, English-speaking, and Latina women in this study. Thus, if disparities in health care delivery could be minimized, Pap smear acquisition can approach the Healthy People 2010 goal of 90%.[26]

This study had several strengths. We achieved a high response rate in sampling a community-based population of multi-ethnic women. The interviewer-administered format in three languages allowed us to collect detailed data regarding ethnicity and cancer screening practices. Our use of an area-probability sampling strategy increased the likelihood that women of different ethnicities would be comparable in terms of unmeasured confounders such as access to public transit and exposure to public service announcements in the mass media.

This study also had several limitations. Ascertainment of Pap smear status was based on self-report. Although there is some evidence that self-report of Pap smear status has a low specificity,[34] most studies of Pap smear acquisition have used unverified self-report.[11,14,16,18,24,35–38] Our study was limited to

Table 4. Multivariate logistic regression models predicting a recent Pap smear (*N*=700 women ≥40 years of age)

Ethnic category	*Crude and adjusted odds ratios (95% confidence intervals)* *Unadjusted*	*Model 1*[a]	*Model 2*[b]
Haitian[c]	0.57 (0.33, 0.97)	0.66 (0.34, 1.26)	0.82 (0.41, 1.67)
English-speaking Caribbean	1.19 (0.45, 3.14)	2.29 (0.71, 7.40)	2.07 (0.62, 6.94)
Latina	1.71 (0.66, 4.44)	2.09 (0.76, 5.74)	1.69 (0.60, 4.80)
White, not Hispanic	0.44 (0.24, 0.78)	0.69 (0.36, 1.35)	0.68 (0.33, 1.39)
African American	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
p-value[d]	0.003	0.03	0.19

[a]Adjusted for age, marital status, education level, and household income.

[b]Adjusted for age, marital status, education level, household income, insurance status, physician gender, and single place of care.

[c]Included 275 women who reported having been born in Haiti who self-identified as "Haitian," or "Haitian American," two women who reported having been born in other Caribbean countries (Dominican Republic and Cuba) who self-identified as "Haitian," and one women who did not identify an ethnicity who reported having been born in Haiti to Haitian parents.

[d]Overall difference in Pap smear rates by ethnicity

women at least 40 years of age and may not generalize to younger women. We also included women older than 65. Cervical cancer screening in this age group is controversial;[39] however, older minority women have a relatively high rate of abnormal Pap smears[40,41] and are at higher risk for invasive cervical cancer than younger or white women.[42] We also stratified by age, creating separate models for women older or younger than 65 (not shown). Although our power for this analysis was limited, it suggests that ethnic differences in Pap smear rates are more pronounced among older women. Further research will be needed to better characterize any possible interaction of age and ethnicity with respect to Pap smear acquisition.

The higher incidence of invasive cervical cancer in Haitian immigrant women[5,6,25,43] has been attributed to lower rates of Pap smear acquisition in this community. However, in the present study, the initially observed relationship of ethnicity to receipt of Pap smears was explained by health care delivery variables and specific demographic characteristics. Many of the health care delivery variables are potentially modifiable by public health programs, and such programs may account for the relatively high Pap smear rates seen in this study population. Thus, our data suggest that a health care system with government mandate and funding to serve the needs of limited-English-speaking immigrants can succeed. Other regions with lower Pap smear rates may be able to use this model to improve preventive health delivery to immigrant women. At the same time, however, these programs will be challenged to continue operation in a more fiscally restricted era. Public health and elected officials will need to consider closely how implementing or withdrawing these programs may impact immigrant and minority communities.

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