original report

Presentation, Treatment, and Outcomes of Haitian Women With Breast Cancer in Miami and Haiti: Disparities in Breast Cancer—A Retrospective Cohort Study

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Supported by a grant from Susan G. Komen for the Cure and funded in part by Gatorade Trust, Department of Medicine, University of Florida College of Medicine and Innovating Health International.

Presented in part at the 8th Annual American Association for Cancer Research Conference of the Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Medically Underserved, Atlanta, GA, November 13-15, 2015.

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abstract

Purpose We compared a cohort of Haitian immigrants with residents in Haiti with breast cancer (BC) to evaluate the effects of location on presentation, treatment, and outcomes.

Patients and Methods Participants were Haitian women with BC living in Miami who presented to the University of Miami/Jackson Memorial Hospital and women with BC living in Haiti who presented to the Innovating Health International Women's Cancer Center. The primary outcome was the relationship between location, cancer characteristics, and survival. The secondary objective was to compare our results with data extracted from the SEER database. Cox regression was used to compare survival.

Results One hundred two patients from University of Miami/Jackson Memorial Hospital and 94 patients from Innovating Health International were included. The patients in Haiti, compared with the patients in Miami, were younger (mean age, 50.2 *v* 53.7 years, respectively; $P = .042$), presented after a longer duration of symptoms (median, 20 *v* 3 months, respectively; $P < .001$), had more advanced stage (44.7% *v* 25.5% with stage III and 27.6% *v* 18.6% with stage IV BC, respectively), and had more estrogen receptor (ER)–negative tumors (44.9% *v* 26.5%, respectively; $P = .024$). The percentage of women who died was 31.9% in Haiti died compared with 17.6% in Miami. Median survival time was 53.7 months for women in Haiti and was not reached in Miami. The risk of death was higher for women in Haiti versus women in Miami (adjusted hazard ratio, 3.09; $P = .0024$).

Conclusion Women with BC in Haiti experience a significantly worse outcome than immigrants in Miami, which seems to be related to a more advanced stage and younger age at diagnosis, more ER-negative tumors, and lack of timely effective treatments. The differences in age and ER status are not a result of access to care and are unexplained.

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INTRODUCTION

In the past 20 years, breast cancer (BC) diagnosis and death has risen in low- and middle-income countries (LMICs), and BC is the most frequent cause of cancer death in women in most regions.[1-3] Disparities in BC outcomes have been reported for different races and ethnicities and income levels within a country despite adjusting for known confounders.[4] These differences are multifactorial and are related to differences not only in tumor biology but also in screening practices, access to care, and overall socioeconomic status. However, accurate registries are missing for many regions, and characterization of how migration status influences BC characteristics and survival in different populations has not yet been demonstrated.

The Haitian population constitutes 1.5% of immigrants in the United States and is the fourth largest group from the Caribbean after Cuba, the Dominican Republic, and Jamaica.[5] Many Afro-Caribbean immigrants live in south Florida. In this study, we compared Haitian immigrants with residents in Haiti diagnosed with BC to evaluate the effects of geographic location on presentation, treatment, and outcomes.

PATIENTS AND METHODS

Study Design and Study Population

This was a retrospective cohort study. The study population included Haitian women, living in Miami, who presented to the University of Miami (UM)/Jackson Memorial Hospital (JMH) between

2008 and 2014 with a new diagnosis of BC and women in Haiti who presented to the Innovating Health International Women's Cancer Center (IHI-WCC) in Port-au-Prince from 2013 to 2015 for care. Patients were identified by a review of the UM/JMH BC clinic patient roster and the IHI-WCC program database. All patients were confirmed by chart review. The institutional review board at UM and the Haitian National Bioethics Committee approved the study, data collection, transmission methods, and storage protocols.

JMH is a university-based, tertiary, safety net hospital in Miami, Florida. It is estimated that more than 40% of Haitians in Florida live in Miami-Dade County[6] and that 8% of the patients attending the JMH BC clinic are Haitian. Haiti has a population of 11 million and no fellowship-trained oncologists. This clinical and research program in Haiti is supported through a collaboration of the US-based nonprofit IHI and the University of Florida College of Medicine. IHI-WCC, working with the Haitian Ministry of Health, partners in a public and private hospital that serves as an urban tertiary center and is the second largest BC program in the country.

Definitions and End Points

Data were collected on patient demographics, disease and treatment characteristics, and clinical outcome. Slightly more than half of biopsies from Haiti (52%) were sent to the United States for pathology and immunohistochemistry, but not all of those had human epidermal growth factor receptor 2 (HER2) expression performed because it does not affect treatment decisions in Haiti as a result of the lack of trastuzumab. Those biopsies performed in Haiti reported histopathologic diagnosis but not estrogen receptor (ER), progesterone receptor (PR), or HER2 statuses.

Follow-up was defined as time in months from BC diagnosis to date of death or last date of follow-up. Progression-free survival (PFS) was defined as the time from cancer diagnosis to relapse, disease progression, new contralateral BC, or death from any cause; patients who were alive and progression free were censored at the date of last documented progression-free status. Overall survival (OS) was defined as the time from cancer diagnosis to death from any cause; follow-up for alive patients was censored at date of last contact. Death was confirmed by clinical records and the Social Security Death Index for patients in Miami and by direct contact with family members for patients in Haiti.

Historical Comparison Data

We extracted data from the SEER-18 registries research database. We selected women diagnosed with BC from 2008 to 2012 (American Joint Committee on Cancer, sixth edition, stage 0 to IV), with an age at diagnosis $\geq$ 18 years and race or ethnicity of non-Hispanic white (NHW) or non-Hispanic black (NHB). These race/ethnicity groups were derived from the SEER variables race recode (RAC_RECY) and the North American Association of Central Cancer Registries Hispanic/Latino Identification Algorithm recode of Hispanic origin. We selected patients on the basis of ER and PR status, who were then classified as both ER and PR negative or as ER or PR positive. These selection criteria yielded a case listing of 35,285 NHB and 232,072 NHW women to compare with our two cohorts of Haitian women. In this selected SEER data set, we derived triple-negative status. Note that ERBB2 status (formerly HER2 or HER2/neu) is available in SEER for cases diagnosed in 2010 and later.

Statistical Analysis

Data were analyzed by complete case analysis. Patient-related and cancer-related variables were described as categorical, discrete, or continuous variables using the corresponding descriptive statistics such as absolute and relative frequencies, mean, median, range, interquartile range, and standard deviation (SD); 95% CIs or SEs were reported as appropriate. Comparisons between the cohorts were performed using the *t* test or the nonparametric Mann-Whitney-Wilcoxon test for continuous variables and the Fisher's exact test or the χ^2 test for categorical variables.

OS curves were estimated using the Kaplan-Meier method. The 95% CIs for time-specific rates and median OS were estimated using the log-log transform method and the Greenwood's variance. The log-rank test and Cox proportional hazards regression analysis were used to compare OS between women in Haiti and in Miami. The method by Fine and Gray was used to estimate the effect of study cohort on the risk of death from BC, taking into account death from other causes as the competing risk.[7] Statistical analyses were performed using SAS 9.4 (SAS Institute, Cary, NC).

RESULTS

Baseline Patient Characteristics

One hundred two patients were included in the Miami cohort, and 98 patients were included in the Haiti cohort. Demographic, cancer-related, and treatment characteristics are listed in Table 1.

Table 1. Demographic and Breast Cancer–Related Characteristics of Study Cohorts

Characteristic	Haitians in Haiti		Haitians in Miami		
	No. (n = 94)	%	No. (n = 102)	%	*P*
Age at diagnosis, years					
< 40	21	22.3	8	7.8	.024
40-49	27	28.7	27	26.5	
50-59	27	28.7	40	39.2	
⩾ 60	19	20.2	27	26.5	
< 50	48	51.1	35	34.3	.018
⩾ 50	46	48.9	67	65.7	
Mean	50.2		53.7		.042
SD	12.9		11.1		
Median	48.5		54		
Range	27-89		27-88		
BMI, kg/m^2	86		99		< .001
< 25	41	47.7	18	18.2	
25-29.99	29	33.7	33	33.4	
⩾ 30	16	18.6	48	48.5	
Mean	25.9		30.0		< .001
SD	5.1		5.4		
Symptoms before presentation					
Yes	87	92.6	82	80.4	.014
No/NA	7	7.4	20	19.6	
Time with symptoms, months	62		82		< .001
Mean	26.6		6		
SD	24.3		7.7		
Median	20		3		
Range	1-120		0.5-48		
Cancer stage					
0 (DCIS)	1	1.1	14	13.7	< .001
I	2	2.1	15	14.7	
II	23	24.5	28	27.5	
III	42	44.7	26	25.5	
IV	26	27.6	19	18.6	
0/I/II	26	27.7	57	55.9	< .001
III	42	44.7	26	25.5	
IV	26	27.6	19	18.6	
Receptor status					
ER	49				.024
Negative	22	44.9	27	26.5	
Positive	27	55.1	75	73.5	
PR	34				.013
Negative	22	64.7	41	40.2	
Positive	12	35.3	61	59.8	

(Continued on following page)

Table 1. Demographic and Breast Cancer–Related Characteristics of Study Cohorts (Continued)

Characteristic	Haitians in Haiti		Haitians in Miami		
	No. (n = 94)	%	No. (n = 102)	%	*P*
HER2	25				.358
Negative	18	72.0	82	80.4	
Positive	7	28.0	20	19.6	
Treatment	73				
Surgery					< .001
Mastectomy	44	60.3	42	41.2	
Lumpectomy	6	8.2	36	35.3	
None/palliative/unknown (only in Haiti)	23	31.5	24	23.5	
Neoadjuvant chemotherapy					.209
Yes	25	34.2	26	25.5	
None/unknown (only in Haiti)	48	65.8	76	74.5	
Adjuvant chemotherapy					< .001
Yes	48	65.8	35	34.3	
None/unknown (only in Haiti)	25	34.2	67	65.7	
Radiation					< .001
Yes	7	9.6	59	57.8	
None/unknown (only in Haiti)	66	90.4	43	42.4	
Hormonal therapy* in ER-/PR-positive patients	27		75		.565
Yes	19	70.4	57	76.0	
None/unknown (only in Haiti)	8	29.6	18	24.0	
HER2-directed therapy in HER2-positive patients	7		20		< .001
Yes	0	0.0	15	75.0	
None	7	100	5	25.0	

Abbreviations: DCIS, ductal carcinoma in situ; ER, estrogen receptor; HER2, human epidermal growth factor receptor 2; NA, not available; PR, progesterone receptor; SD, standard deviation.

*Additional 12 patients with unknown ER status received hormonal therapy.

The mean age at BC diagnosis was 53.7 years (range, 27 to 88 years) for women in Miami compared with 50.2 years (range, 27 to 89 years) for women in Haiti ($P = .042$). Mean body mass index was 25.9 kg/m^2 (SD, 5.1 kg/m^2) in Haiti compared with 30 kg/m^2 (SD, 5.4 kg/m^2) in Miami ($P < .001$). One patient from Miami had bilateral BC at the time of presentation, and six patients presented with a new contralateral second primary tumor. Three patients in Haiti presented with bilateral BC. In Miami, all patients had ER, PR, and HER2 status ascertained at diagnosis, whereas only 52%, 36.2%, and 26.6% of the women living in Haiti had ER, PR, and HER2 status ascertained, respectively. Among those with known receptor status in Miami and Haiti, ER status was positive in 73.5% and 55.1% of patients, respectively ($P = .024$), and HER2 status was positive in 19.6% and 28% of patients, respectively ($P = .358$). There was a significant difference in the disease stage between patients in Miami and Haiti ($P < .001$), as follows: 13.7% and 1.1% with stage 0 (ductal carcinoma in situ), 14.7% and 2.1% with stage I, 27.5% and 24.5% with stage II, 25.5% and 44.7% with stage III, and 18.6% and 27.6% with stage IV, respectively.

In Miami, 80% of patients presented with symptoms, whereas 20% of patients presented after abnormal screening. In Haiti, 92.6% of the patients presented with a self-detected mass. The median time from onset of symptoms before first health care evaluation was 3 months (range, 0.5 to 48 months) in Miami compared with 20 months (range, 1 to 120 months) in Haiti ($P < .001$).

Clinical Outcomes After Treatment

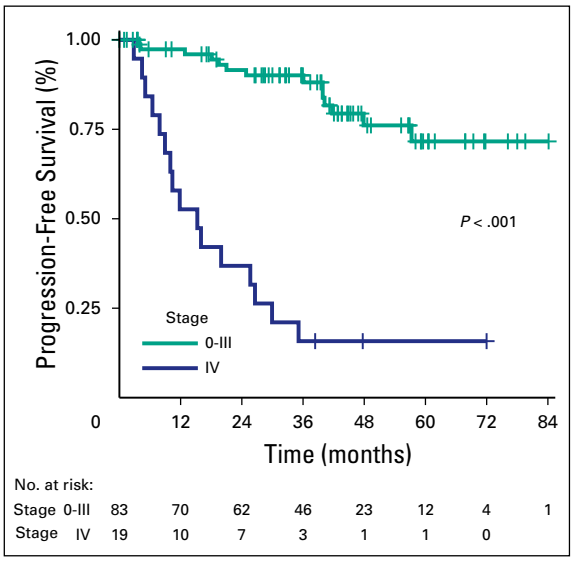
PFS. In Miami, 30 patients had progressive disease, including 14 (16.90%) of 83 patients who

were initially diagnosed with stage 0 to III disease and 16 (84.2%) of 19 patients with metastatic disease. For patients in Miami who presented with stage 0 to III disease, four patients (4.8%) experienced relapse, six patients experienced progression on neoadjuvant therapy, and two patients refused therapy. Two patients developed a new contralateral BC. The median PFS was not reached for those treated with curative intent, whereas it was 15.3 months (95% CI, 7.9 to 26.6 months) for patients with metastatic disease (Fig 1).

In the cohort from Haiti, 11 patients experienced progression (median time to progression, 24 months; range, 5 to 80 months), and 16 patients died as a result of BC (median OS, 11 months; range, 0.2 to 23 months). Length of PFS is difficult to compare between the two groups because the progression of disease was much more likely to be detected by physical exam or symptoms in Haiti, whereas in the United States, the use of staging computed tomography scans is common. However, this would underestimate the difference rather than increase it, so it seems that the PFS is much shorter in Haiti for patients without metastatic disease.

OS. OS was significantly different in the two cohorts ($P < .001$). In Miami, 18 (17.6%) of 102 patients died, 15 (14.7%) from BC (10 patients with initial metastatic disease and five with initial curable disease) and three from a second malignancy (colorectal cancer, bladder cancer, and lung cancer). The median length of follow-up was 42 months (interquartile range, 28 to 57 months) among 84 alive patients at last contact. In Haiti, 23 (31.9%) of 72 patients died of BC, 14 (19.4%) with initial metastatic disease and nine (12.5%) with curable disease.

Fig 1. Kaplan-Meier estimates of progression-free survival by stage in Miami cohort.



The Kaplan-Meier estimate of median OS was 53.7 months for patients with curable disease in Haiti and was not reached in for patients in Miami. For patients with metastatic disease, the median OS was 38.5 months in Miami compared with 18.3 months in Haiti (Fig 2 and Table 2). In univariable analysis, the risk of death was higher for women in Haiti than women in Miami (hazard ratio, 4.02; 95% CI, 2.10 to 7.68; $P < .001$; Table 2). As reported in Table 2, results from analysis in stage 0 to III patients, taking into account the three deaths from other causes as competing risks, estimated the risk of death as 10.28-fold higher in Haiti versus Miami (adjusted hazard ratio, 10.28; 95% CI, 3.08 to 34.33; $P < .001$).

Comparison Analysis With Historical Data From SEER Database

Table 3 lists the main characteristics of the subgroups. The age at diagnosis was significantly different between all groups, with women in Haiti presenting at a mean age of 50.2 years, Haitian women in Miami at 53.7 years, NHB women at 58.8 years, and NHW women at 62.4 years. Stage IV disease was seen in 27.6% of women living in Haiti, 18.6% of women living in Miami, 5.9% of NHB women, and 3.8% of NHW women. The rate of negative ER and PR status was 35.7% for women in Haiti, 26.5% for women in Miami, 25.3% for NHB women, and 14.9% for NHW women. HER2 was positive for 28% of women in Haiti, 19.6% of women in Miami, 19.7% of NHB women, and 16.1% of NHW women. Triple-negative disease was seen in 17.5% of women in Haiti, 21.6% of women in Miami, 11.9% of NHB women, and only 5.5% of NHW women.

DISCUSSION

We found that Haitian women with BC living in Haiti experience a significantly worse outcome than Haitian women who were born in Haiti and immigrated to Miami. This may not be surprising as a result of the lack of screening practices, limited pathologic evaluation for receptor status, poor access to care, delays in treatment, and unavailability of radiation and HER2-targeted therapy in Haiti. However, there were differences in age at presentation and intrinsic tumor characteristics that confer a poorer prognosis that cannot be explained by access to care.

Cancer care differences between LMICs and high-income countries (HICs) are striking. More than 70% of patients in most HICs are diagnosed at stage I or II, compared with 20% to 50% of patients

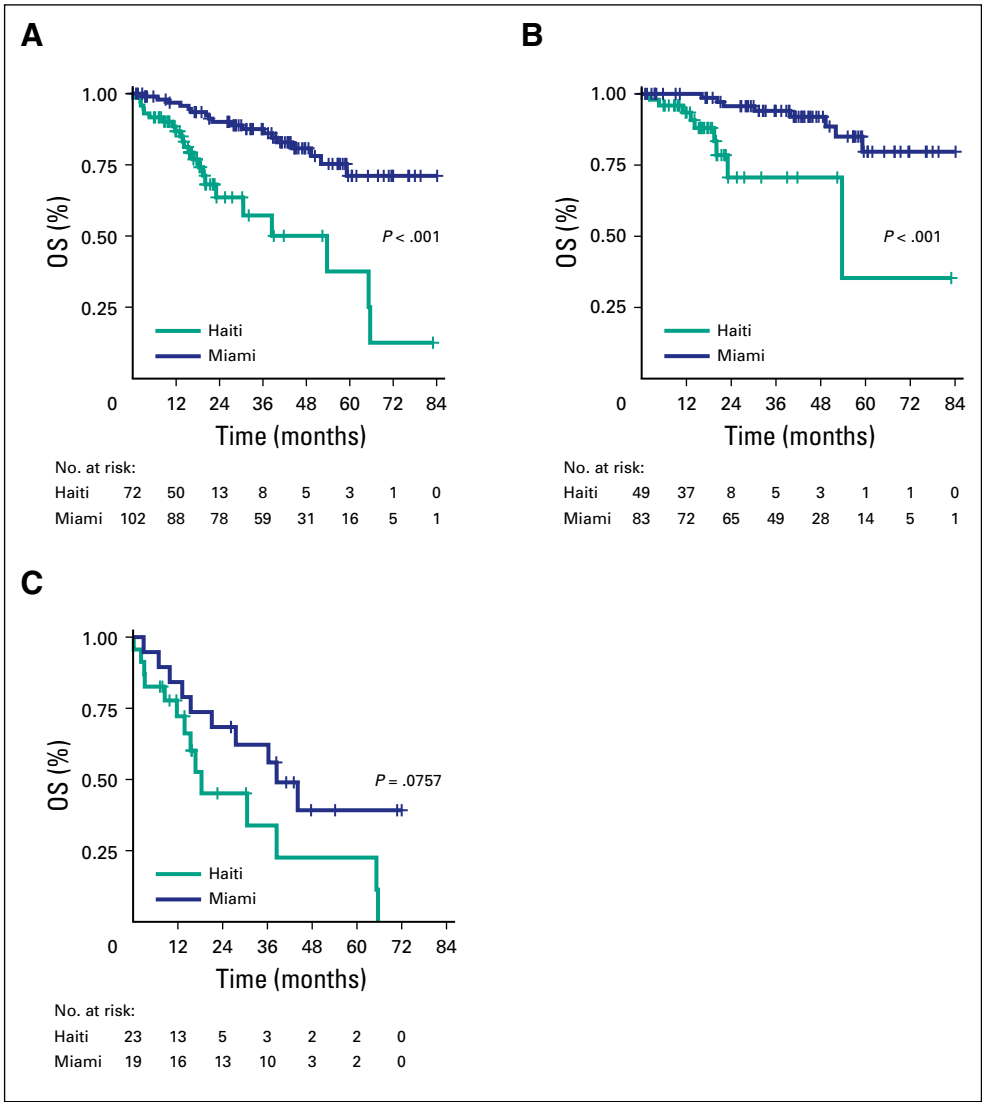


Fig 2. Kaplan-Meier estimates of overall survival (OS) by study cohort in (A) all patients, (B) patients with stage 0 to III disease, and (C) patients with stage IV disease at presentation. The median OS time was 53.7 months for patients with curable breast cancer (stage 0 to III) in Haiti and was not reached for patients in Miami. For metastatic disease (stage IV), the median OS times were 18.3 months for patients in Haiti compared with 38.5 months for patients in Miami.

in the majority of LMICs.[8] Stage at presentation in Haiti was skewed to stage III and IV, with only 27.7% of women presenting with stage 0 to II. For Haitians living in Miami, this percentage was better (55.9%), but was still lower than for NHB women (80.7%) and NHW women (87.1%). Delays in diagnosis have been associated with more advanced stage and worse prognosis.[9-14] In a review of delays comparing HICs with LMICs, where BC total delay is defined as more than 3 months between symptom discovery and the beginning of treatment, it was found that among HICs, the median range of symptom duration before treatment was 30 to 48 days and more than 60% of patients began treatment less than 3 months after symptom discovery. In comparison, the median time of symptom duration before treatment for LMICs was 5.5 to 8 months, and less than 30% of patients started treatment in less than 3 months.[8] Women in Haiti had extreme delays in diagnosis even by LMIC standards, with a median time from onset of symptoms before first health care evaluation of 20 months. Although living in an HIC, Haitian women living in Miami still experienced both patient delays (median time between symptom onset and presentation of 3 months) and provider delay (median time from the initial health care encounter to treatment of 72 days). Only 18.6% of patients started treatment within 4 months of symptom discovery, and this remains outside of the average for HICs.

Access and quality of care deficiencies are multifactorial. Patients in Haiti have no access to screening, but even after they moved to an HIC, their utilization rates remained suboptimal. A recent report documents that only 58% of Haitian women living in the United States who should undergo screening actually do so.[15] This

Table 2. Summary of Death Events, OS, and Death From Breast Cancer Between the Two Study Cohorts, Overall and by Stage at Disease Presentation

	All Patients		Stage 0-III Patients		Stage IV Patients	
Survival	**Haiti**	**Miami**	**Haiti**	**Miami**	**Haiti**	**Miami**
No. of patients	72	102	49	83	23	19
No. of deaths	23	18*	9	8*	14	10
OS						
Median OS, months (95% CI)	53.7 (23.1 to 65.6)	NE	53.7 (23.1 to NE)	NE	18.3 (11.7 to 38.5)	38.5 (15.4 to NE)
4-year OS, % (95% CI)	50.1 (28.6 to 68.2)	80.8 (69.7 to 88.2)	70.6 (45.5 to 85.8)	91.9 (81.5 to 96.6)	22.6 (4.2 to 49.6)	39.2 (15.1 to 62.8)
P†	< .001		< .001		.0757	
Unadjusted HR (95% CI)	4.02 (2.10 to 7.68)	Ref	5.26 (1.91 to 14.52)	Ref	2.10 (0.91 to 4.82)	Ref
P‡	< .001		.0013		.0807	
Adjusted HR§ (95% CI)	3.09 (1.49 to 6.40)	Ref	7.24 (2.15 to 24.34)	Ref	2.10 (0.83 to 5.31)	Ref
P‡	.0024		.0012		0.118	
Survival from breast cancer						
Unadjusted HR (95% CI)	4.83 (2.51 to 9.28)	Ref	8.19 (2.96 to 22.67)	Ref		
P§	< .001		< .001			
Adjusted HR¶ (95% CI)	3.46 (1.65 to 7.24)	Ref	10.28 (3.08 to 34.33)	Ref		
P§	.001		< .001			

NOTE. In all patients, patients with stage 0 to III disease, and patients with stage IV disease, univariable models were based on 174, 132, and 42 patients, respectively, and multivariable models were based on 163, 124, and 42, patients, respectively, as a result of missing data.

Abbreviations: HR, hazard ratio; NE, not evaluable; OS, overall survival; Ref, reference.

*Three deaths occurred from other causes at the following times from diagnosis: 16.1 months (stage II, 53 years old), 49.3 months (stage 0, 73 years old), and 59.2 months (stage I, 72 years old).

†*P* value from log-rank test comparing the two cohort OS curves estimated by the Kaplan-Meier method.

‡*P* value from Wald test for significance of the HR comparing Haiti versus Miami (Ref) derived from Cox regression models.

§*P* value from Wald test for significance of the HR derived from Fine and Gray regression models taking into account death from other causes as competing risk.

¶Adjusted HR comparing Haiti versus Miami (Ref), from multivariable models including age ($\geq v < 50$ years) and body mass index ($\geq v < 30$ kg/m^2). In the analysis of all patients, we also included stage at disease presentation (IV *v* 0-III).

Table 3. Age, Disease Stage, and Receptor Status at Diagnosis of Our Study Cohorts Compared With Data Extracted From the SEER Database From 2008 to 2012 for Non-Hispanic Black and Non-Hispanic White Women

Characteristic	Percentage of Patients			
	Haitians in Haiti (n = 94)	Haitians in Miami (n = 102)	Non-Hispanic Black Women (n = 35,285)	Non-Hispanic White Women (n = 232,072)
Age at diagnosis, years				
< 40	22.3	7.8	6.5	3.3
40-49	28.7	26.5	19.2	14.9
50-59	28.7	39.2	27.8	23.8
⩾ 60	20.2	26.5	46.5	57.9
< 50	51.1	34.3	25.7	18.3
⩾ 50	48.9	65.7	74.3	81.7
Mean (SD)	50.2 (12.9)	53.7 (11.1)	58.8 (13.2)	62.4 (13.3)
Median	48.5	54	58	62
Interquartile range	41-58	47-60	49-58	52-72
Range	27-89	27-88	18-108	18-114
Cancer stage				
0 (DCIS)	1.1	13.7	18.4	17.2
I	2.1	14.7	31.2	42.9
II	24.5	27.5	31.1	27.0
III	44.7	25.5	13.3	9.0
IV	27.6	18.6	5.9	3.8
Receptor status				
ER, No.	49		35,278	232,029
Negative	44.9	26.5	26.9	15.7
Positive	55.1	73.5	73.1	84.3
PR, No.	34		34,930	229,161
Negative	64.7	40.2	38.8	27.1
Positive	35.3	59.8	61.2	72.9
ER/PR, No.	42			
Both negative	35.7	26.5	25.3	14.9
Either one or both positive*	64.3	73.5	74.7	85.1
HER2,† No.	25		17,988	116,992
Negative	72.0	80.4	80.3	83.9
Positive*	28.0	19.6	19.7	16.1
Triple-negative status, No.	40		31,147	214,439
Yes	17.5	21.6	11.9	5.5
No	82.5	78.4	88.1	94.5

Abbreviations: DCIS, ductal carcinoma in situ; ER, estrogen receptor; HER2, human epidermal growth factor receptor 2; PR, progesterone receptor; SD, standard deviation.
*Positive includes borderline.
†HER2 status available in SEER for patients diagnosed in 2010 and later.

rate is low compared with national averages, which were reported to be 66.8% for NHW and 67.1% for NHB in 2013.[16] Barriers for health care utilization cited for this cohort included lack of health insurance coverage, lack of health education, communication and language barriers, and concerns about immigration status.[15,17,18] Other factors that have been described for BC total delay include low socioeconomic factors, ethnic minorities, travel time to hospital, long waiting times to get medical appointments, and consulting three or more different health services before arrival to a cancer center.[8]

It is unclear why the native Haitians in our study presented with more ER-negative disease than the immigrant Haitian women. The triple-negative rate in native Haitian women with known receptor status was 44.9% compared with 26.5% in Haitians in Miami. The rate of triple-negative BC was similar between Haiti immigrants and African American women (26.5% *v* 28.4%, respectively). These rates remain significantly elevated compared with the 15.2% rate of triple-negative BC reported in NHW women. All ER and HER2 testing was performed in the United States, so the testing was consistent and accurate, although there may be some effect from storage or preservation of the Haitian samples that influenced the rate of positive ER tests.

There are distinct differences in the age of BC presentation in the four cohorts. The women in our study who lived in Haiti had symptoms for almost 2 years before presentation, which argues that the age of onset is actually younger than stated and that the age difference is greater than what we document. One explanation is that the life expectancy in Haiti is 61 years, which means that women die of competing causes of mortality before they reach ages where BC incidence increases. The average age of a Haitian immigrant is 45 years, which is younger than the average age of BC onset in Haiti. Thus, it seems that women immigrate before the average age of BC onset. According to institutional data, 96% of Haitian women seeking care at JMH immigrated within 5 years.[15] Research shows that environmental and behavioral factors in Westernized countries, such as smoking, nutrition, physical inactivity, and fertility factors, increase the incidence of hereditary and sporadic BC in immigrants over a prolonged period.[19-21] Short-term effects of immigration on BC development have never been documented.

Our study suggests that Afro-Caribbean women from Haiti have different age of onset and tumor characteristics than NHB women reported in SEER data. Recently, members of our research group found that other Afro-Caribbean women develop BC at an earlier age than either European American or African American women.[22] Taioli et al[23] found that Caribbean women living in Brooklyn are diagnosed at an older age than women from the Caribbean territories. The Afro-Caribbean population has extremely diverse ancestry, with populations with deep genetic roots in West Africa, northern Europe, the Indian subcontinent, China, the Middle East, and southern Europe and native Caribbean populations. The different ethnicities within African descents are distinct in terms of beliefs, behaviors, risk factors, and disease experience, which have an impact on the accurate use of this term for epidemiologic and public health research.[24-26] Our data raise the question about whether disparities exist within subgroups of women of African origin.

In conclusion, Haitians diagnosed with BC in Haiti experience a significantly worse outcome than Haitian immigrants in Miami, which seems to be related to a more advanced stage and younger age at diagnosis, more ER-negative tumors, and lack of timely effective treatments. In addition, there are differences in the age of presentation and ER-positive status that raise the question of whether there are disparities within subgroups of women of African origin who have BC. Confounding epigenetic-related variables and other environmental factors might impact survival and need further exploration.

DOI: https://doi.org/10.1200/JGO.2016.005975
Published online on jgo.org on November 2, 2016.

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Manuscript writing: All authors
Final approval of manuscript: All authors
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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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