

5-2015

# Factors Affecting Compliance With Colorectal Cancer Screening Among Households Residing in the Largely Haitian Community of Little Haiti, Miami-Dade County, Florida

Meredith Leigh Wilcox

*Herbert Wertheim College of Medicine, Florida International University, mlwilcox@fiu.edu*

Juan M. Acuna

*Herbert Wertheim College of Medicine, Florida International University, jacuna@fiu.edu*

Pura Rodríguez de la Vega

*Herbert Wertheim College of Medicine, Florida International University, rodrigup@fiu.edu*

Grettel Castro

*Herbert Wertheim College of Medicine, Florida International University, gcastrol@fiu.edu*

Purnima Madhivanan

*Herbert Wertheim College of Medicine, Florida International University, pmadhiva@fiu.edu*

Follow this and additional works at: [http://digitalcommons.fiu.edu/com\\_facpub](http://digitalcommons.fiu.edu/com_facpub)

 Part of the [Medicine and Health Sciences Commons](#)

---

## Recommended Citation

Wilcox, Meredith Leigh; Acuna, Juan M.; Rodríguez de la Vega, Pura; Castro, Grettel; and Madhivanan, Purnima, "Factors Affecting Compliance With Colorectal Cancer Screening Among Households Residing in the Largely Haitian Community of Little Haiti, Miami-Dade County, Florida" (2015). *HWCOC Faculty Publications*. Paper 63.

[http://digitalcommons.fiu.edu/com\\_facpub/63](http://digitalcommons.fiu.edu/com_facpub/63)

This work is brought to you for free and open access by the Herbert Wertheim College of Medicine at FIU Digital Commons. It has been accepted for inclusion in HWCOC Faculty Publications by an authorized administrator of FIU Digital Commons. For more information, please contact [dcc@fiu.edu](mailto:dcc@fiu.edu).

# Factors Affecting Compliance With Colorectal Cancer Screening Among Households Residing in the Largely Haitian Community of Little Haiti, Miami-Dade County, Florida

## *An Observational Study*

Meredith Leigh Wilcox, MPH, Juan Manuel Acuña, MD, MSc, Pura Rodriguez de la Vega, MPH, Grettel Castro, MPH, and Purnima Madhivanan, PhD

**Abstract:** The United States Black population is disproportionately affected by colorectal cancer (CRC) in terms of incidence and mortality. Studies suggest that screening rates are lower among Blacks compared with non-Hispanic Whites (NHWs). However, studies on CRC screening within Black subgroups are lacking. This study examined disparities in blood stool test (BST) compliance and colonoscopy use by race/ethnicity (Haitian, NHW, non-Hispanic Black [NHB], and Hispanic) among randomly selected households in Little Haiti, Miami-Dade County, Florida.

This study used cross-sectional, health and wellness data from a random-sample, population-based survey conducted within 951 households in Little Haiti between November 2011 and December 2012. BST compliance and colonoscopy use were self-reported and defined, conservatively, as the use of BST within the past 2 years and the ever use of colonoscopy by any household member. Factors associated with BST compliance and colonoscopy use were identified using logistic regression models. Analyses were restricted to households containing at least 1 member  $\geq 50$  years ( $n = 666$ ).

Nearly half of the households were compliant with BST (rate [95% confidence interval (CI)] = 45% [41%–49%]) and completed colonoscopy (rate [95% CI] = 53% [49%–58%]). Compliance with BST was not associated with race/ethnicity ( $P = 0.76$ ). Factors independently associated with BST compliance included low educational attainment (adjusted odds ratio [AOR] = 0.63,  $P = 0.03$ ), being single (AOR = 0.47,  $P = 0.004$ ), retirement (AOR = 1.96,  $P = 0.01$ ), and the presence of diagnosed health problems (AOR = 1.24,  $P = 0.01$ ). Colonoscopy use was lower among Haitian households (46%) compared with

NHW (63%), NHB (62%), and Hispanic households (54%) ( $P = 0.002$ ). Factors independently associated with colonoscopy use included identifying as NHB (compared with Haitian) (AOR = 1.80,  $P = 0.05$ ), being single (AOR = 0.44,  $P = 0.001$ ), retirement (AOR = 1.86,  $P = 0.02$ ), lack of continuous insurance (AOR = 0.45,  $P < 0.001$ ), and the presence of diagnosed health problems (AOR = 1.44,  $P < 0.001$ ) and physical limitations/disabilities (AOR = 1.88,  $P = 0.05$ ).

Compliance with BST and use of colonoscopy are low within households in the Little Haiti community. Significant disparities in the use of colonoscopy exist between Haitian and NHB households. Barriers and facilitators of colonoscopy within each racial/ethnic group need to be identified as the next step to developing culturally appropriate, community-based interventions aimed at increasing colonoscopy use in this large minority population.

(*Medicine* 94(18):e806)

**Abbreviations:** BST = blood stool test, CI = confidence interval, CIDI-SF = Composite International Diagnostic Interview-Short Form, CRC = colorectal cancer, IRB = institutional review board, NHB = non-Hispanic Black, NHW = non-Hispanic White, SPSS = Statistical Package for the Social Sciences, VIF = variance inflation factor.

## INTRODUCTION

Despite being largely preventable through routine screening, colorectal cancer (CRC) remains the third most diagnosed cancer among United States men and women.<sup>1,2</sup> Screening by fecal occult blood test and endoscopy also enables the early detection and treatment for CRC, if initiated at the recommended age and repeated at effective time intervals.<sup>2,3</sup> Unfortunately, only two-thirds of the United States population recommended for screening is compliant with their screening practices.<sup>4</sup> As a result, a mere 2 out of 5 cases are diagnosed at an early stage when the cancer remains confined to the colon or rectum and when the patient has a 90% chance of surviving 5 years after diagnosis.<sup>5,6</sup> Owing to the underutilization of screening and low survival associated with late diagnosis, CRC persists as a major cause of cancer-related deaths in the United States, second only to lung cancer.<sup>1</sup>

CRC disproportionately affects racial/ethnic minority groups in the United States. For instance, the Black population experience higher incidence, higher overall mortality, and lower 5-year survival compared with non-Hispanic Whites (NHWs).<sup>5,7,8</sup> It is estimated that 42% of the disparity in incidence and 19% of the disparity in mortality between Blacks

Editor: Ugo Nzeako.

Received: March 11, 2015; revised: March 30, 2015; accepted: March 31, 2015.

From the Department of Medical and Health Sciences Research, Herbert Wertheim College of Medicine (MLW, JMA, PRDLV, GC); Department of Epidemiology, Robert Stempel College of Public Health and Social Work (MLW, PM); and Department of Human and Molecular Genetics, Florida International University, Miami, Florida, USA (JMA).

Correspondence to Meredith Leigh Wilcox, Department of Medical and Health Sciences Research, Herbert Wertheim College of Medicine, Florida International University, 11200 SW 8th Street, University Park, PG5-244, Miami, FL 33199, USA (e-mail: mwilc003@fiu.edu).

The Little Haiti benchmark survey was supported by a National Institutes Health (NIH) grant (NCHMHD supplement for the P20 MD002288–04).

The authors have no conflicts of interest to disclose.

Copyright © 2015 Wolters Kluwer Health, Inc. All rights reserved.

This is an open access article distributed under the Creative Commons Attribution-NoDerivatives License 4.0, which allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to the author.

ISSN: 0025-7974

DOI: 10.1097/MD.0000000000000806

and Whites can be explained by differences in access to and utilization of timely screening.<sup>7,9</sup> This is particularly striking and highlights the importance of screening since, at the national level, screening rates for Blacks are only slightly lower than that of NHWs.<sup>8,10–13</sup> Unfortunately, data on screening within individual Black subgroups are unclear largely because the definition of race/ethnicity used by national databases does not differentiate between these subgroups. As defined by the 2010 Census, the Black racial category refers to individuals having origins of any of the Black racial groups of Africa and includes those that identify as Black; African American; Sub-Saharan African, such as Kenyan and Nigerian; and Afro-Caribbean entries, such as Haitian and Jamaicans.<sup>14</sup> Recent research suggests that Haitians in particular complete screening at rates lower than not only NHWs, but also other Blacks subgroups due to linguistic, cultural, and socioeconomic barriers.<sup>15–17</sup> Existing literature on screening for CRC among Haitian populations are particularly limited though, with the majority of studies having methodological issues such as low sample sizes and nonrandom samples.<sup>17</sup>

This paper assessed the association between compliance with blood stool test (BST) and race/ethnicity, and ever use of colonoscopy and race/ethnicity among 666 randomly selected households located in or near the underserved, minority community of Little Haiti, Miami-Dade County, Florida. We hypothesized that households of Haitian descent comply with BST and complete colonoscopy at lower rates than NHW and non-Hispanic Black (NHB) households. A secondary aim of this study was to identify general barriers and facilitators of compliance with BST and the use of colonoscopy among this largely Haitian community.

## METHODS

### Data Collection and Participant Recruitment

This study utilized data from the random-sample, population-based Little Haiti benchmark survey. The survey was conducted between November 2011 and December 2012 within 20 United States census tracts approximating the Little Haiti community of Miami-Dade County, Florida. The specific aim of the survey was to collect baseline household and individual health and wellness indicators for families residing in an area with a large Haitian population. The survey consisted of a 156-item general questionnaire and an additional 22-item supplement for Haitian households. The supplement was designed to assess the direct and indirect impact of the 2010 Haiti earthquake on Haitian households in the area, and included questions on the use of herbal medicines and sections A and C of the Composite International Diagnostic Interview-Short Form (CIDI-SF) Mental Health Tool.<sup>18</sup> The survey was administered face-to-face by trained staff in English, Spanish, French, or Creole based on the respondents' preferences. One consenting adult at least 18 years of age completed the questionnaires and supplements on behalf of the entire household. Twenty United States census tracts with a Haitian population of 30% to 49% were selected, from which 1798 households residing in single family homes and townhomes were randomly selected using random probability sampling. Of the 1798 households, 951 (52.9%) completed the survey (70 were completed at replacement addresses), 634 (35.3%) refused participation, and 213 (11.8%) were unreachable after a minimum of 7 attempts to interview a household member, alternating the day of the week and time of day for each attempt.

### Ethical Review

All participants underwent an informed consent process and gave written consent for participation. Taking part in the benchmark survey was strictly voluntary, and participants were assured of anonymity at all times. Confidentiality of participants was maintained by using deidentified data without any personal identification for all analyses. Although the initial benchmark survey was approved by the Florida International University (FIU) Institutional Review Board (IRB), the present study using secondary analysis of anonymous data was exempt from IRB review by the FIU IRB under exemption category #4 ("Existing data, documents, and records specimens").

### Outcome and Explanatory Variables

The outcomes of this study were compliance with BST and the ever use of colonoscopy by at least 1 household member. Compliance with BST was assessed by the following survey question: "About how long ago, if ever, did anyone in the household have... a blood stool test, a test which uses a special home kit to determine whether the stool contains blood". Compliance was conservatively defined as the use of BST within the 2 years prior to the survey. Owing to the rarity of sigmoidoscopy use,<sup>8</sup> response to the following survey question was used to approximate prior use of colonoscopy: "Sigmoidoscopy and colonoscopy are examinations in which a tube is inserted into the rectum to view the colon for signs of cancer or other health problems. Have you or anyone in the household ever had either of these examinations?"

Based on a review of the literature and the variables collected in the survey, 22 sociodemographic and health-related variables with potential to influence compliance with BST and use of colonoscopy were selected. Respondents provided data on educational attainment, marital status, and employment status of the head of the household, and data on their own race/ethnicity, physical activity, dietary habits, and use of alternative medicines. All other variables were reported at the household level. Race/ethnicity was self-reported and categorized as "Haitian" versus the following non-Haitian groups: "non-Hispanic White", "non-Hispanic Black", "Hispanic", and "Others". Educational attainment was categorized as high school or less versus more than high school, with the former comprising of "less than a high school education" and "high school degree or equivalent"; and the latter comprising of "some college", "vocational or technical degree", "bachelor's", "master's", "doctoral", and "professional degree". Marital status was categorized as single versus other, with the latter including "married", "living with a partner", "separated", "divorced", and "widowed". Poverty was calculated as a function of per capita household income and 2012 United States poverty thresholds.<sup>19</sup> Households were defined as uninsured if at least 1 member of the household lacked health insurance at any time within the year prior to the survey. Households with diagnosed health problems were those that reported physician diagnosis of at least one of the following conditions within 5 years prior to the survey: "high blood pressure", "heart attack or any other heart disease", "cancer", "diabetes or sugar diabetes", "anxiety or depression", "obesity", or "asthma". Compliance with mammogram or prostate examination was defined as at least 1 age-appropriate household member being current in the use of either mammogram or prostate examination. Owing to insufficient evidence on the age in which screening should be initiated and on effective screening intervals for prostate cancer,<sup>20</sup> households were

deemed compliant with prostate examination if at least 1 male member age 40 years or older had ever completed a blood test or rectal examination for prostate cancer. Households were deemed compliant with breast cancer screening if at least 1 female member age 40 years or older had had a mammogram within the 2 years prior to the survey.<sup>21</sup> Households were considered to meet recommended guidelines for physical activity if the respondent reported performing moderate exercise for at least 20 minutes per day on 4 or more days in a typical week, or performing vigorous exercise for at least 60 minutes per day on 1 or more days in a typical week. This definition best approximates the minimum level of physical activity necessary for adults to achieve substantial health benefits, as specified by the United States Department of Health and Human Services.<sup>22</sup> Daily consumption of “green salad” was used to approximate daily consumption of vegetables. The use of alternative medicines included the use of any of the following: herbal vitamins/nutrients, acupuncture, chiropractor, traditional healer (such as a “Curendero”), or herbalist.

### Statistical Analysis

Analyses were restricted to households that included at least 1 member aged 50 years or older as a means to assess the use of BST and colonoscopy within households that contain a member recommended for CRC screening. Of the 951 households that completed the survey, 70% (666) met the criteria. Data are presented using frequencies and percentage of total. Compliance with BST and the use of colonoscopy was reported separately for each racial/ethnic group using percentages and 95% confidence intervals (CIs). Chi-squared tests were used to identify the differences in compliance with BST and the use of colonoscopy by sociodemographic and health-related variables. Logistic regression analyses were conducted to assess the association between the outcomes and Haitian descent. Analyses were performed using Statistical Package for the Social Sciences (SPSS) v19.0 (SPSS Inc, Chicago, IL), and using a two-tailed statistical significance of  $P < 0.05$ .

Variables conservatively associated with each outcome (chi-squared  $P$ -value  $< 0.20$ ) and those of clinical importance were selected a priori as independent variables for the logistic regression models. Variables were excluded from the model if the percentage of missing values was large (ie,  $\approx 10\%$  or greater), low variability was observed within the response categories overall or when stratified by the outcomes (ie, if approximately 90% or more of the values were contained within a single response category), the assumption of independence was violated (as in the case of variables with nonmutually exclusive response categories), or multicollinearity was present. For each outcome, chi-squared tests were conducted to determine if nonresponse was associated with sociodemographic variables. Multicollinearity was assessed by the analysis of variance inflation factors (VIFs)<sup>23</sup> and Pearson correlation coefficients.

## RESULTS

### Characteristics of the Sample

Half of the households reported being of Haitian descent (Table 1). The majority of non-Haitian households self-identified as Hispanic (37%) or Black (32%), followed by NHW (17%) and other (14%). Three out of 5 households reported speaking a language other than English. The majority of non-English speaking households spoke Creole (71%) or Spanish

(26%). Half of the heads of household had at most a high school degree and a quarter reported being single. Twice as many heads of the household were employed full time as were unemployed and retired. A third of the households were below United States poverty thresholds and half had at least 1 member who was uninsured at some point within the year prior to the survey.

Nine out of 10 households had visited a doctor within the year prior to the survey (89%); among these households most reported having a regular place of care (99%) and a regular healthcare provider (90%) (data not shown). Three out of 4 households reported that at least 1 member's regular place of care was a doctor's office or private clinic (76%); other frequently reported places of care included community health centers or public clinics (22%) and hospital emergency rooms (16%). The most commonly reported source of current health insurance among the household members was employer provided (42%), followed by Medicare (29%), Medicaid (28%), self-insured (6%), and other government programs (2%). Nearly 1 out of 10 households reported that at least 1 member had postponed medical care required within the year prior to the survey (15%), did not follow a doctor's advice or treatment plan or get a recommended test (16%), and had experienced communication problems with a healthcare provider due to speaking different languages (11%). Four out of 5 households had at least 1 member with at least 1 diagnosed health condition; the most commonly reported condition among these households was high blood pressure (86%), followed by diabetes (40%), heart attack or other heart disease (22%), asthma (17%), obesity (14%), anxiety or depression (11%), and cancer (10%). More than 3 times as many households reported the presence of physical limitations or disabilities (14%) as mental (4%) or emotional limitations or disabilities (3%).

### Use of Tests

Nearly half of the households were compliant with the use of BST (45%, 95% CI = 41%–49%) and reported previously undergoing colonoscopy (53%, 95% CI = 49%–57%) (Table 2). Colonoscopy use was directly related to frequency of BST use. Previous completion of colonoscopy was reported by 36% ( $n = 84$ ) of households that never completed BST, 59% ( $n = 24$ ) of households that completed BST more than 2 years prior to the survey, and 73% ( $n = 165$ ) of households that were compliant with BST. One out of 4 households had never completed either test.

### Nonresponse

Approximately 22% of the households had missing data for BST ( $n = 146$ ) and 10% had missing data for colonoscopy ( $n = 146$ ). Households with missing data for BST were comparable to those with valid responses for BST on all sociodemographic variables, except education, marital status, and employment. A greater proportion of households with missing data for BST had heads who were more educated ( $>$ high school: 60% vs. 47%,  $P = 0.01$ ), single (33% vs. 21%,  $P = 0.003$ ), and employed part time (18% vs. 9%,  $P = 0.001$ ); although a lower proportion were retired (13% vs. 26%,  $P = 0.001$ ). Likewise, households with missing data for colonoscopy were not comparable to those with valid responses in regards to marital status and employment. A greater proportion of households with missing data for colonoscopy had heads who were single (36% vs. 22%,  $P = 0.01$ ) and employed full time (56% vs. 43%,  $P = 0.006$ ) while fewer were retired (7% vs. 25%,  $P = 0.006$ ).

**TABLE 1.** Description of Households With at Least 1 Member Age 50 Years or Older in Little Haiti, Miami-Dade County, Florida, United States, 2011–2012 (N = 666)

Characteristic	n (%)
Race/ethnicity	
Haitian	325 (48.9)
Non-Hispanic White	58 (8.7)
Non-Hispanic Black	108 (16.3)
Hispanic	125 (18.8)
Other	48 (7.2)
Primary language—non-English*	380 (57.1)
Education—high school or less*	322 (50.0)
Marital status—single*	157 (23.8)
Employment	
Unemployed	142 (21.5)
Employed part time	73 (11.1)
Employed full time	291 (44.2)
Retired	153 (23.2)
Below United States poverty threshold*	160 (34.9)
Health insurance—uninsured*	308 (48.4)

\*Frequencies and percentages are presented for households that reported “yes”. Primary language: non-English speaking households reported speaking primarily Creole (71%), Spanish (26%), and other (3%). Education: high school or less included heads of the household with less than a high school education (44%) or a high school degree or equivalent (56%). Beyond high school included heads of the household with a technical or vocational degree (8%), some college (42%), bachelor’s degree (39%), master’s degree (8%), and doctoral degree or professional degree (3%). Marital status: heads of the household that were not single reported being married (66%), living with a partner (3%), separated (7%), divorced (13%), or widowed (11%). Poverty is based on the 2012 United States poverty thresholds and takes into account reported household income and household size. (Available at: <http://www.census.gov/hhes/www/poverty/data/threshld/index.html>) Health insurance: “Uninsured” was defined as any household member lacking health insurance at any time within the 12 months prior to the survey.

**Use of Tests by Household Characteristics**

Compliance with BST and the use of colonoscopy was approximately 14% and 25% lower, respectively, among

Haitian households compared with both NHW households and NHB households; however, only colonoscopy use was significantly associated with race/ethnicity. Haitian households complied with BST and completed colonoscopy at rates slightly lower than those of Hispanic households, with a larger disparity observed for colonoscopy (7% lower and 14% lower, respectively) (Tables 2 and 3).

Compliance with BST and the use of colonoscopy was significantly lower among households whose head was single ( $P=0.03$  and  $0.001$ , respectively) and unemployed or employed part time ( $P<0.001$ ) (Table 3). Compliance with BST was also lower among those whose head had a high school education or less ( $P=0.02$ ), while colonoscopy use was also lower among households that spoke languages other than English ( $P=0.003$ ). On the contrary, both compliance with BST and the use of colonoscopy were greater among households that reported visiting a doctor within the previous year ( $P<0.001$ ) and having a regular healthcare provider ( $P=0.003$  and  $P<0.001$ , respectively). Households in which a member used a doctor’s office or private clinic for regular care reported higher rates of colonoscopy use ( $P=0.002$ ) (see Table, Supplemental Content, <http://links.lww.com/MD/A259>, which describes BST compliance and colonoscopy use by all factors included in the analysis). Health insurance coverage ( $P<0.001$ ), particularly Medicare ( $P<0.001$ ), compliance with mammogram or prostate examination ( $P<0.001$ ), and the presence of diagnosed health problem ( $P=0.001$  and  $P<0.001$ , respectively) were also associated with increased compliance with BST and completion of colonoscopy. In addition, colonoscopy use was greater among households that reported physical limitations or disabilities ( $P=0.003$ ).

**Variables Excluded From the Logistic Regression Analyses**

Multicollinearity was present between race/ethnicity and primary language (VIF = 1.135 and 1.269, respectively;  $r=0.302$ ); the latter was excluded from the models. The following variables were also excluded from the models due to lack of variability in responses or low cell counts: visited

**TABLE 2.** Patterns of the Use of Blood Stool Test and Colonoscopy by Race/Ethnicity in Little Haiti, Miami-Dade County, Florida, United States, 2011–2012 (N = 666)

Race/ Ethnicity	Ever Use of BST*	Compliant With BST†	% Prevalence (95% CI)			
			Ever Use of Colonoscopy‡	At Least 1§	Both	Never Either¶
Haitian	50.0 (43.7–56.3)	41.8 (35.6–48.0)	46.3 (40.5–52.0)	65.5 (59.7–71.3)	28.9 (23.0–34.8)	30.7 (25.0–36.3)
Non-Haitian	54.9 (49.0–60.8)	47.3 (41.3–53.2)	60.3 (54.7–65.8)	74.4 (69.3–79.5)	36.7 (30.9–42.6)	23.2 (18.3–28.1)
White, non-Hispanic	67.3 (54.1–80.5)	48.1 (34.0–62.1)	62.5 (49.4–75.6)	77.8 (66.3–89.2)	34.6 (21.2–48.0)	16.7 (6.4–26.9)
Black, non-Hispanic	56.6 (45.7–67.5)	49.4 (38.4–60.4)	61.5 (51.4–71.7)	76.4 (67.4–85.4)	37.7 (26.6–48.7)	21.3 (12.7–30.0)
Hispanic	47.0 (37.1–57.0)	45.0 (35.1–54.9)	54.0 (44.7–63.3)	68.2 (59.3–77.2)	33.7 (24.2–43.2)	30.8 (22.0–39.7)
Other	53.8 (37.5–70.2)	46.2 (29.8–62.5)	73.2 (59.0–87.3)	81.6 (68.7–94.5)	47.2 (30.1–64.4)	15.8 (3.6–27.9)
Total	52.7 (48.4–57.0)	44.8 (40.5–49.1)	53.4 (49.4–57.5)	70.2 (66.4–74.1)	33.2 (29.0–37.4)	26.7 (23.0–30.4)

BST = blood stool test.

\* Ever use of BST defined as completion of BST by at least 1 household member at any time prior to the survey.

† Compliance with BST defined as completion of BST by at least 1 household member within the 2 years prior to the survey.

‡ Ever use of colonoscopy defined as completion of colonoscopy by at least 1 household member at any time prior to the survey.

§ Household is compliant with BST, completed a prior colonoscopy, or both.

|| Household is both compliant with BST and has completed a prior colonoscopy.

¶ Household has never completed a BST nor colonoscopy.

**TABLE 3.** Compliance with Blood Stool Test and Use of Colonoscopy by Sociodemographic and Health-Related Variables in Little Haiti, Miami-Dade County, Florida, United States, 2011 to 2012 (N = 666)

Characteristic	Prevalence			
	Compliance With BST		Ever Use of Colonoscopy	
	n (%)	P-Value	n (%)	P-Value
Total	233 (44.8)	NA	319 (53.4)	NA
Race/ethnicity		0.76		0.002
Haitian	102 (41.8)		136 (46.3)	
Non-Hispanic White	25 (48.1)		35 (62.5)	
Non-Hispanic Black	41 (49.4)		56 (61.5)	
Hispanic	45 (45.0)		61 (54.0)	
Other	18 (46.2)		30 (73.2)	
Primary language		0.92		0.003
Non-English	136 (44.9)		168 (48.3)	
English	96 (44.4)		150 (60.5)	
Education		0.02		0.13
≤High school degree	105 (39.6)		148 (50.3)	
More than high school degree	120 (50.4)		161 (56.7)	
Marital status		0.03		0.001
Single	39 (35.8)		54 (40.9)	
Other	192 (47.2)		262 (57.0)	
Employment		<0.001		<0.001
Unemployed	33 (29.2)		50 (39.1)	
Employed part time	13 (27.7)		27 (43.5)	
Employed full time	84 (62.7)		130 (51.4)	
Retired	99 (45.0)		108 (73.0)	
Below United States poverty threshold		0.50		0.97
Yes	60 (45.1)		83 (55.0)	
No	119 (48.8)		149 (54.8)	
Visited doctor/clinic in past year		<0.001		<0.001
Yes	222 (47.5)		304 (56.8)	
No	11 (20.8)		15 (24.2)	
Regular doctor*		0.003		<0.001
Yes	210 (50.1)		290 (60.3)	
No	12 (26.7)		14 (26.9)	
Experienced language barrier with doctor		0.28		0.70
Sometimes—always	31 (51.7)		34 (51.5)	
Never	201 (44.3)		283 (54.0)	
Health insurance		<0.001		<0.001
Uninsured	86 (36.3)		110 (40.4)	
Insured	140 (53.0)		194 (65.1)	
Diagnosed health problems		0.001		<0.001
Yes	204 (48.6)		284 (59.2)	
No	28 (29.2)		34 (29.8)	
Physical limitations/disabilities		0.07		0.003
Yes	42 (54.5)		57 (68.7)	
No	191 (43.2)		262 (51.1)	
Ever smoked cigarettes		0.89		0.06
Yes	69 (44.5)		99 (59.6)	
No	163 (45.2)		217 (51.1)	
Use of alternative medicines		0.71		0.10
Yes	57 (43.8)		91 (59.1)	
No	176 (45.7)		225 (51.4)	

\* Reported only for households that reported visiting a doctor or medical clinic within the year prior to completing the survey. BST = blood stool test. Compliance with blood stool test defined as use of blood stool test (BST) within 2 years prior to the survey. Primary language: non-English speaking households reported speaking primarily Creole (71%), Spanish (26%), and other (3%). Education: “high school or less” included heads of the household with less than a high school education (44%) or a high school degree or equivalent (56%). “Beyond high school” included heads of the household with a technical or vocational degree (8%), some college (42%), bachelor’s degree (39%), master’s degree (8%), and doctoral degree or professional degree (3%). Marital status: heads of the household that were not single reported being married (66%), living with a partner (3%), separated (7%), divorced (13%), or widowed (11%). Poverty is based on the 2012 United States poverty thresholds and takes into account reported household income and household size. (Available at: <http://www.census.gov/hhes/www/poverty/data/threshld/index.html>) Health insurance: “uninsured” was defined as any household member lacking health insurance at any time within the 12 months prior to the survey. Diagnosed health problems were defined as physician diagnosis of at least one of the following conditions among at least 1 household member within 5 years prior to the survey: high blood pressure (70%), heart attack or any other heart disease (18%), cancer (8%), diabetes or sugar diabetes (32%), anxiety or depression (9%), obesity (11%), or asthma (14%). Ever smoked cigarettes: ever smoking includes current smoking (45%) and former smoking (55%), with current smoking defined as smoking at least 1 cigarette within the month prior to the survey. The use of alternative medicines includes the reported use of herbal vitamins/nutrients (20%), acupuncture (3%), chiropractor (8%), traditional healer (such as a “Curendero”), or herbalist (2%).

doctor/medical clinic in past year, regular doctor, and compliance with mammogram or prostate examination; and the following due to violation of the assumption of independence: types of regular place of care and sources of current health insurance. Poverty was excluded from the models due to a large percentage of missing values (31%).

**Factors Associated With the Use of Tests**

**Compliance with BST**

Results of the logistic regression analysis are presented in Table 4. Race/ethnicity was not a significant factor of compliance with BST when the referent was Haitian households. Odds of complying with BST were 37% lower if the head of the household had a high school education or less, and 53% lower if the head was single. Odds of compliance were 96% greater, on the other hand, if the head of the household was retired (compared with employed full time), and 24% greater if at least 1 household member had a diagnosed health problem.

**Colonoscopy Use**

Results of the logistic regression analysis are presented in Table 4. Odds of having completed colonoscopy were significantly greater among NHB households compared with Haitian households; this disparity persisted after adjusting for other potential factors of colonoscopy. No disparity in the use of colonoscopy was observed between Haitian households and NHW or Hispanic households in the adjusted model. Notably,

odds of having completed colonoscopy were 56% lower if the head of the household was single, and 55% lower if at least 1 member had a lapse in health insurance coverage within the year prior to the survey. On the contrary, odds of having completed colonoscopy were 80% greater among NHB households compared with Haitian households, 86% greater if the head was retired (compared with employed full time), 44% greater if any member had a diagnosed health problem, and 88% greater if any member had physical limitations or disabilities.

**DISCUSSION**

Nearly half of the surveyed households in the Little Haiti community had never completed a BST or undergone colonoscopy, with a quarter having never completed either test. Compliance with BST and prior use of colonoscopy among Haitian households were notably lower than that of both NHW and NHB households and even slightly lower than that of Hispanic households—the latter being a group with known disparities in adherence to cancer screening.<sup>8,10–13</sup> Factors relating to socioeconomic status, increasing age, access to health services, and comorbidities were associated with both compliance with BST and the use of colonoscopy among the surveyed households.

One out of 4 households in this study reported having neither a BST nor a colonoscopy. This is comparable to the proportion of United States adults that have never been screened for CRC.<sup>4</sup> Similar to a previous random-sample, population-based study conducted among 1118 households residing in nearby northwest

**TABLE 4.** Odds of Complying With Blood Stool Test and Prior Use of Colonoscopy Among Households Containing at Least 1 Member Age 50 Years or Older in Little Haiti, Miami-Dade County, Florida, United States, 2011 to 2012 (N = 666)

Characteristic	Compliance With BST				Ever Use of Colonoscopy			
	Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR (95% CI)	P	AOR (95% CI)	P	OR (95% CI)	P	AOR (95% CI)	P
Race/ethnicity								
Haitian	Ref.	—	Ref.	—	Ref.	—	Ref.	—
Non-Hispanic White	1.29 (0.71–2.35)	0.41	0.99 (0.47–2.07)	0.98	1.94 (1.08–3.49)	0.03	1.62 (0.78–3.38)	0.20
Non-Hispanic Black	1.36 (0.82–2.24)	0.23	1.14 (0.63–2.07)	0.67	1.86 (1.15–3.01)	0.01	1.80 (1.00–3.22)	0.05
Hispanic	1.14 (.71–1.82)	0.59	1.16 (0.67–1.98)	0.60	1.36 (0.88–2.11)	0.16	1.50 (0.89–2.53)	0.13
Others	1.19 (.61–2.35)	0.61	0.75 (0.34–1.65)	0.47	3.17 (1.53–6.56)	0.002	2.19 (0.95–5.05)	0.07
Education—high school or less*	0.65 (0.45–0.92)	0.02	0.63 (0.42–0.96)	0.03	0.77 (0.56–1.07)	0.13	0.81 (0.54–1.20)	0.29
Marital status—single*	0.62 (0.40–0.97)	0.03	0.47 (0.29–0.79)	0.004	0.52 (0.35–0.78)	0.001	0.44 (0.27–0.70)	0.001
Employment								
Unemployed	0.50 (0.31–0.82)	0.006	0.62 (0.36–1.07)	0.09	0.61 (0.39–0.93)	0.02	0.60 (0.35–1.01)	0.06
Employed part time	0.47 (0.23–0.93)	0.03	0.50 (0.23–1.06)	0.07	0.73 (0.42–1.28)	0.27	0.78 (0.40–1.51)	0.46
Employed full time	Ref.	—	Ref.	—	Ref.	—	Ref.	—
Retired	2.05 (1.32–3.19)	0.001	1.96 (1.18–3.26)	0.01	2.56 (1.65–3.96)	<0.001	1.86 (1.10–3.12)	0.02
Health insurance—uninsured*	0.50 (0.35–0.72)	<0.001	0.70 (0.46–1.06)	0.09	0.36 (0.26–0.51)	<0.001	0.45 (0.30–0.68)	<0.001
Diagnosed health problems—yes*	1.26 (1.09–1.46)	0.001	1.24 (1.05–1.47)	0.01	1.53 (1.32–1.78)	<0.001	1.44 (1.21–1.72)	<0.001
Physical limitations/disabilities—yes*	1.58 (0.97–2.57)	0.07	1.49 (0.84–2.67)	0.18	2.10 (1.28–3.45)	0.003	1.88 (1.01–3.52)	0.05
Smoking (cigarette)—never smoker*	1.03 (0.70–1.50)	0.89	1.35 (0.85–2.16)	0.21	0.71 (.49–1.02)	0.06	1.21 (0.76–1.91)	0.43
Use of alternative medicines—yes*	0.93 (0.62–1.38)	0.71	1.04 (0.65–1.65)	0.87	1.37 (0.94–1.98)	0.10	1.43 (0.92–2.23)	0.12

OR = odds ratio; AOR = adjusted odds ratio; CI = confidence interval; P = P-value.

\* Reference is the complement to the category provided. Education: “high school or less” included heads of the household with less than a high school education (44%) or a high school degree or equivalent (56%). “Beyond high school” included heads of the household with a technical or vocational degree (8%), some college (42%), bachelor’s degree (39%), master’s degree (8%), and doctoral degree or professional degree (3%). Marital status: heads of the household that were not single reported being married (66%), living with a partner (3%), separated (7%), divorced (13%), or widowed (11%). Health insurance: “uninsured” was defined as any household member lacking health insurance at any time within the year prior to the survey. Diagnosed health problems were defined as physician diagnosis of at least one of the following conditions among at least 1 household member within 5 years prior to the survey: high blood pressure (70%), heart attack or any other heart disease (18%), cancer (8%), diabetes or sugar diabetes (32%), anxiety or depression (9%), obesity (11%), or asthma (14%). Smoking (cigarette): ever smoking includes current smoking (45%) and former smoking (55%), with current smoking defined as smoking at least 1 cigarette within the month prior to the survey. The use of alternative medicines includes the reported use of herbal vitamins/nutrients (20%), acupuncture (3%), chiropractor (8%), traditional healer (such as a “Curendero”), or herbalist (2%).

Miami-Dade County, Florida (M.L. Wilcox, MPH, unpublished data, October 2009- April 2010). Compliance with BST in the Little Haiti community was notably greater than the national and state average of approximately 11% to 12%.<sup>4</sup> However, non-compliance was 22% higher in the Little Haiti community compared with the largely African American and Hispanic communities of northwest Miami-Dade County; specifically, approximately 33% more households in Little Haiti reported never having completed a BST. Prior use of colonoscopy, on the other hand, was similar to that observed in northwest Miami-Dade and approximately 10% lower than compliance with colonoscopy at the national and state levels.<sup>4</sup>

The underutilization of BST and colonoscopy among the Haitian households compared with NHB households in this study mirrored a previously published study on self-reported screening behaviors among 3 Black subgroups in Hillsborough County, Florida.<sup>16</sup> Among a convenience sample of 62 United States Black individuals, Gwede et al found specifically that Haitian participants reported using fecal occult blood test and colonoscopy at rates lower than African American and English-speaking Caribbean participants. Likewise, we observed lower rates of BST and colonoscopy use among the Haitian households in our study compared with households that self-identified with other Black subgroups, although we did not analyze the use of these tests within the other subgroups individually. The use of BST and colonoscopy was greater however among the Haitian households in our study compared with the Haitian individuals included in the study by Gwede et al (ever BST: 50% vs. 20%, respectively; ever colonoscopy: 46% vs. 15%, respectively). The observed differences in the use of these tests between studies may be attributed to notable differences in study methodologies, particularly differences in the unit of analysis (household vs. individual), sampling technic (random probability sampling vs. convenience sampling), and sample size (325 households vs. 20 individuals). In addition, socioeconomic characteristics of Haitians residing in Little Haiti may differ from those of other Haitian populations within the state or country, potentially limiting the generalizability of the findings of this study to Haitians residing in South Florida.

Disparities in compliance with BST and the use of colonoscopy were not observed in our study between Haitian and NHW households—disparities that were expected, but likely not detected due to the small NHW population within the Little Haiti community. It is also interesting to note that compliance with BST and the use of colonoscopy among non-Haitian/NHB households are comparable with that of NHW households in this study—a pattern similarly observed at the national level.<sup>8,10–13</sup> Although national studies do not distinguish Haitians from the other Black subgroups, the observed similarities are likely due to the low Haitian population at the national level (estimated at <1%). However, having tripled in size over the past 2 decades, the Haitian population is a rapidly growing minority group in the United States, with nearly half residing in the state of Florida.<sup>24,25</sup> Thus, the disparity in the use of BST and colonoscopy observed among the Haitian community in this study, and the potential cultural factors driving this disparity, should not be ignored.

This study was the first, to our knowledge, to identify a significant disparity in the use of colonoscopy between Haitian and NHB populations using a large, randomly selected sample from an underserved, minority community. The sampling methods used in this study resulted in a large sample of households, in particular Haitian households. The main limitation of the study was the use of secondary data that was not primarily collected to investigate patterns and factors of CRC screening.

All data collected in the Little Haiti benchmark survey were self-reported by a single member on behalf of the entire household. Accuracy of the responses cannot be assessed and therefore outcome and exposure misclassification cannot be ruled out. However, the results of this study may represent the best-case scenario, as self-reported use of cancer screening tests at the national level have been shown to overestimate screening rates and underestimate disparities in screening.<sup>26</sup> In addition, since we could not determine the motivation behind completing BST and colonoscopy (eg, for diagnostic versus screening purposes, or for noncancer related conditions), actual screening rates for CRC in this community may be lower than the rates observed in this study. Residual confounding is another potential source of bias in this study. The benchmark survey was a broad questionnaire covering many aspects of health and wellness, largely at the household level. As a result, comprehensive data on factors believed to influence the use of preventive care and screening for CRC were not collected, such as knowledge and awareness of CRC and screening tests, acculturation, risk perception, and physician recommendation.<sup>15–17</sup> Patterns of the use of these tests by geographic location were explored, but ultimately were not addressed in this study. Factors relating to location may have influenced the use of BST and colonoscopy within the community, such as distance to the nearest health care facility. Lastly, since the use of BST and colonoscopy was reported for the household as a whole, we cannot determine whether the household member that completed the BST or colonoscopy was the member recommended for routine screening (ie, is 50 years or older), or whether all members recommended for screening had completed the tests.

Compliance with BST and the use of colonoscopy are low among households residing in the community of Little Haiti, Miami-Dade County, Florida. Haitian households were found to use these tests at rates lower than those of NHW, NHB, and Hispanic households, individually. However, only in the case of colonoscopy were significant disparities observed, specifically between Haitian and NHB households. Generally, differences in both compliance with BST and the use of colonoscopy were observed by factors relating to socioeconomic status, health assess, and comorbidities. Barriers and facilitators of colonoscopy within each racial/ethnic group need to be identified as the next step to developing culturally appropriate, community-based interventions aimed at increasing colonoscopy use in the large minority population of Little Haiti.

## ACKNOWLEDGMENTS

*The authors would like to acknowledge the faculty, staff, and community interviewers at the Department of Medical and Health Sciences Research.*

## REFERENCES

1. American Cancer Society. Cancer Facts & Figures. Atlanta: American Cancer Society; 2013.
2. Whitlock EP, Lin JS, Liles E, et al. Screening for colorectal cancer: a targeted, updated systematic review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2008;149:638–658.
3. U.S. Preventive Services Task Force (USPSTF). Screening for colorectal cancer: U.S. Preventive Services Task Force recommendation statement. Technical Report 08-05124-EF-3, Agency for Healthcare Research and Quality (AHRQ) Publication, 2008.
4. Centers for Disease Control and Prevention. Vital signs: colorectal cancer screening test use – United States, 2012. *MMWR.* 2013;62:881–888.



5. American Cancer Society. Colorectal Cancer Facts & Figures 2014–2016. Atlanta: American Cancer Society; 2014.
6. Howlader N, Noone AM, Krapcho M, et al. SEER Cancer Statistics Review, 1975–2008, National Cancer Institute, Bethesda, MD, [http://seer.cancer.gov/csr/1975\\_2008/](http://seer.cancer.gov/csr/1975_2008/), based on November 2010 SEER data submission, posted to the SEER web site, 2011. Accessed 28 Feb 2015.
7. Siegel R, DeSantis C, Jemal A. Colorectal cancer statistics, 2014. *CA Cancer J Clin*. 2014;64:104–117.
8. Steel CB, Rim SH, Joseph DA, et al. Colorectal cancer incidence and screening – United States, 2008 and 2010. *MMWR*. 2013;62:53–60.
9. Lansdorp-Vogelaar I, Kuntz KM, Knudsen AB, et al. Contribution of screening and survival differences to racial disparities in colorectal cancer rates. *Cancer Epidemiol Biomarkers Prev*. 2012;21:728–736.
10. Smith RA, Manassaram-Baptiste D, Brooks D, et al. Cancer screening in the United States, 2014: a review of current American Cancer Society guidelines and current issues in cancer screening. *CA Cancer J Clin*. 2014;64:30–51.
11. Centers for Disease Control and Prevention. Vital signs: colorectal cancer screening test use – United States, 2012. *MMWR*. 2013;62:881–888.
12. Shapiro JA, Klabunde CN, Thompson TD, et al. Patterns of colorectal cancer test use, including CT colonography, in the 2010 National Health Interview Survey. *Cancer Epidemiol Biomarkers Prev*. 2012;21:895–904.
13. Centers for Disease Control and Prevention. Cancer Screening—United States, 2010. *MMWR*. 2012;61:41–45.
14. U.S. Census Bureau. The Black Population: 2010. 2010 Census Briefs. Technical Report C2010BR-06. U.S. Department of Commerce, 2011.
15. Francois F, Elysee G, Shah S, et al. Colon cancer knowledge and attitudes in an immigrant Haitian community. *J Immigr Minor Health*. 2009;11:319–325.
16. Gwede CK, William CM, Thomas KB, et al. Exploring disparities and variability in perceptions and self-reported colorectal cancer screening among three ethnic subgroups of U.S. blacks. *Oncol Nurs Forum*. 2010;37:581–591.
17. Considine NS, Tuck NL, Ragin CR, et al. Beyond the black box: a systematic review of breast, prostate, colorectal, and cervical screening among native and immigrant African-Descent Caribbean populations. *J Immigr Minor Health*. 2014doi: 10.1007/s10903-014-9991-0. [Epub ahead of print].
18. Kessler RC, Andrews G, Mroczek D, et al. The World Health Organization Composite International Diagnostic Interview Short Form (CIDI-SF). *Int J Methods Psychiatr Res*. 1998;7:171–185.
19. U.S. Department of Health and Human Services. 2012 HHS Poverty Guidelines. Washington D.C.: U.S. Department of Health and Human Services. <http://aspe.hhs.gov/poverty/12poverty.shtml/faq.shtml>. Accessed 28 Feb 2015.
20. U.S. Preventive Services Task Force (USPSTF). Screening for prostate cancer: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2008;149:185–191.
21. U.S. Preventive Services Task Force (USPSTF). Screening for breast cancer: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2009;151:716–726.
22. U.S. Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. Washington D.C.: U.S. Department of Health and Human Services. <http://www.health.gov/paguidelines/pdf/paguide.pdf>. Accessed 28 Feb 2015.
23. Montgomery DC, Peck EA, Vining G. Introduction to Linear Regression Analysis. New York: Wiley; 2001.
24. Buchanan AB, Albert NG, Beaulieu D. The population with Haitian ancestry in the United States: 2009. American Community Survey Briefs, 2010. Report ACSBR/09-18. <http://www.census.gov/prod/2010pubs/acsbr09-18.pdf>. Accessed 28 Feb 2015.
25. U.S. Census Bureau. American Community Survey. 2013 American Community Survey 1-Year Estimates, Table B04003; generated using American FactFinder. <http://factfinder2.census.gov>. Accessed 28 Feb 2015.
26. Rauscher GH, Johnson TP, Cho YI, et al. Accuracy of self-reported cancer screening histories: a meta-analysis. *Cancer Epidemiol Biomarkers Prev*. 2008;17:748–757.