All Black People Are Not Alike: Differences in HIV Testing Patterns, Knowledge, and Experience of Stigma Between U.S.-Born and Non-U.S.-Born Blacks in Massachusetts

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Abstract

Non-U.S.-born black individuals comprise a significant proportion of the new diagnoses of HIV in the United States. Concurrent diagnosis (obtaining an AIDS diagnosis in close proximity to an initial diagnosis of HIV) is common in this subpopulation. Although efforts have been undertaken to increase HIV testing among African Americans, little is known about testing patterns among non-U.S.-born black people. A cross-sectional survey was self-administered by 1060 black individuals in Massachusetts (57% non-U.S.-born) to assess self-reported rates of HIV testing, risk factors, and potential barriers to testing, including stigma, knowledge, immigration status, and access to health care. Bivariate analysis comparing responses by birthplace and multivariate logistic regression assessing correlates of recent testing were completed. Non-U.S.-born individuals were less likely to report recent testing than U.S.-born (41.9% versus 55.6%, $p < 0.0001$). Of those who recently tested, the majority did so for immigration purposes, not because of perceived risk. Stigma was significantly higher and knowledge lower among non-U.S.-born individuals. In multivariate analysis, greater length of time since immigration was a significant predictor of nontesting among non-U.S.-born (adjusted odds ratio [AOR] 0.56, 95% confidence interval [CI] 0.36–0.87). Poor health care access and older age were correlated to nontesting in both U.S.- and non-U.S.-born individuals. Our findings indicate that differences in HIV testing patterns exist by nativity. Efforts addressing unique factors limiting testing in non-U.S.-born black individuals are warranted.

Introduction

HIV/AIDS DISPROPORTIONATELY IMPACTS black individuals living in the United States. In 2009, black people comprised 14% of the U.S. population, yet accounted for 44% of all new HIV infections.¹ Similar disparities are noted at the state level; while only 6% of the population of Massachusetts is black (non-Hispanic), over 28% of those living with HIV/AIDS have been identified as black or African American.² Efforts have been made to identify and decrease barriers to HIV testing, care, and treatment faced by specific subpopulations within the black community who are known to be at high risk for HIV infection (men who have sex with men [MSM], injection drug users, those who engage in high-risk heterosexual sex). However, little is known about HIV infec-

tion in foreign or non-U.S.-born black individuals, many of whom have immigrated to the United States from high-prevalence countries in sub-Saharan Africa and the Caribbean and who may comprise a significant proportion of black individuals living with HIV in certain jurisdictions. For example, in Massachusetts 54% (329/595) of cases of HIV diagnosed in blacks from 2007 to 2009 were non-U.S.-born individuals.³ Data that might shed light on unique risk factors and barriers to HIV testing and prevention services faced by immigrant communities are often aggregated with information describing the experience of all “blacks” or “African Americans” without regard to ethnicity or country of origin. Therefore, interventions that have been developed may not address the specific cultural differences, linguistic needs, and policy issues facing this subgroup.

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Non-native black individuals comprise a growing population in many metropolitan centers around the United States. More than one third of the black population residing in Massachusetts (including the Boston metropolitan area) is non-U.S.-born.⁴ Nationwide, immigration, primarily from sub-Saharan Africa and the Caribbean, has contributed to at least one fifth of the growth in the U.S. black population in the last decade.^{5,6} Between 1990 and 2000, immigration by Caribbean- and African-born immigrants increased by 52.3% and 142%, respectively.^{7,8} Although diversity clearly exists within the black community, studies that shed light on HIV infection rates by nativity have only recently emerged. In an analysis of HIV/AIDS cases reported to the CDC from 33 states in 2007, non-U.S.-born black individuals were found to have a slightly higher HIV diagnosis rate than U.S.-born black individuals (81.4 per 100,000 versus 78.9 per 100,000). Gender differences were more striking; the diagnosis rate for non-U.S.-born females was found to be significantly higher than the rate for US born black females (78.8 per 100,000 versus 48.0 per 100,000).⁹ In a study evaluating aggregate data in eight states (California, Georgia, Massachusetts, Minnesota, New Jersey, Washington State, New York, and Virginia/Washington, D.C.) from 2003 to 2004, African-born individuals accounted for up to 49.8% of HIV diagnoses in black individuals (mean, 8.0%; range, 2–50%).¹⁰

HIV testing is the first entry way into vital care and treatment services. Concurrent diagnosis of HIV and AIDS or obtaining a diagnosis of AIDS in close proximity to an initial diagnosis of HIV is usually attributed to late testing. Differences in the prevalence of late testing by race and ethnicity have been noted. According to data from 34 states from 1996 to 2005, 38.3% of persons with HIV diagnoses developed an AIDS diagnosis within 1 year and 45% had an AIDS diagnosis within 3 years. Compared with white individuals in this analysis, a greater percentage of persons of all other racial/ethnic populations tested late.¹¹ Concurrent diagnosis has also been found to be more common amongst non-U.S.-born black individuals than U.S.-born blacks.^{12,13} The delay in diagnosis in this population may be a function of the timing of migration (e.g., the individual was infected in their home country and either did not access HIV testing there before migrating to the United States months to years after infection or did access testing, was found to be infected and was re-tested upon arrival in the United States), barriers that exist and limit access to HIV services in this country or both. Once diagnosed, systems such as Partner Notification, which identifies names of sex or needle-sharing partners for exposure notification, may be underutilized by blacks, particularly non-U.S.-born individuals.¹⁴ Overcoming these barriers, avoiding delays in diagnosis, accessing earlier treatment, and other services may lead to a decrease in morbidity and mortality and a reduction of the probability of further transmission.^{15,16}

Barriers to HIV testing fall within several well-described categories: individual level concerns including fear of results, internal and external stigma attached to testing, anxiety waiting for results, lack of recognition of risk status, and low HIV knowledge; provider level barriers such as lack of funding, limited awareness of testing guidelines, and discomfort; and system related barriers such as limited availability of rapid testing.^{17–20} Although data regarding black non-U.S.-born individuals and HIV testing is limited, data

from Europe indicate that black immigrants (primarily from sub-Saharan Africa) experience many of the same barriers as native born individuals, including fear of positive test results and its related personal and social consequences, lack of preventive health behavior, and denial of HIV risk. HIV-related stigma, language barriers, and low HIV knowledge are also common.^{21,22} Barriers to HIV testing specific to the immigrant experience, such as confusion over health care entitlements, undocumented status, and fear of deportation if one tests positive have been noted in Europe.²³ Here in the United States, similar barriers have been noted in immigrant populations from Latin America.²⁴

Prior to January 2010, the U.S. HIV travel ban mandated HIV testing for all immigrants who required medical examination for U.S. immigration, including some, but not all, entrants desiring long-term residence in the United States. Routine testing after the initial test mandated by immigration was not (and currently is not) required by law. Since the travel ban was lifted HIV testing is no longer mandated and individuals may enter the United States and apply for long-term residence without being offered or accepting HIV testing. Removal of the travel ban was an important step toward decreasing stigma and discrimination toward people living with HIV. Individuals may now travel freely without the fear that they must disclose their status or travel without essential medications. It also promotes reunification for HIV-positive individuals who are separated from their families.²⁵ However, the absence of this mandate will likely significantly impact the testing patterns of immigrant populations.

To the authors' knowledge no study has attempted to determine HIV testing patterns in non-U.S.-born black individuals or compared the barriers and HIV testing experiences of non-U.S.-born versus U.S.-born black populations to determine if differences do exist. Therefore, the purpose of this study was (1) to determine the rate of HIV testing by self-report among non-U.S.-born blacks and (2) to identify barriers to accessing HIV testing in non-U.S.-born blacks and compare them to the barriers faced by U.S.-born black individuals.

Methods

Ethical review

This study was reviewed and approved by the Partners Healthcare Human Research Subjects Committee.

Study design

This study was designed to determine self-reported rate of HIV testing in non-U.S.-born versus U.S.-born individuals and to explore barriers to HIV testing. A cross-sectional survey was conducted from June 2010 to November 2011. Inclusion criteria were self-identified black race, ages 18–64, and being sexually active. Knowledge of HIV status was not included in the inclusion/exclusion criteria; participants whose status was unknown, who were known to be positive and who reported that they were HIV negative were included in the analysis.

Recruitment

This study was conducted in Suffolk, Essex, Plymouth, and Middlesex Counties in Massachusetts. The highest concentration

of non-U.S.-born blacks in Massachusetts is in the Boston-metropolitan area (Suffolk County) where 29.7% of the black population is non-U.S.-born.²⁶ The remaining counties were chosen because of the existence of small- to medium-sized communities of non-U.S.-born black individuals. Prior to study initiation research assistants were hired from three of the target communities: an African immigrant, a Haitian immigrant and an African American individual. Convenience sampling was used to capture non-U.S.-born black individuals representing diverse demographic profiles and a variety of countries. Survey participants were recruited using street outreach focused on highly trafficked shopping areas, ethnic grocery stores, bars/clubs, and restaurants. Survey participants were also recruited at country/region specific national celebration events, parades, and festivals that are held during the spring and summer months. U.S.-born black individuals were also recruited from public venues (grocery stores, shopping areas, bars/clubs, etc.) in these four counties. Finally, survey participants (both U.S.- and non-U.S.-born) were recruited from waiting rooms at local community centers and community health centers. More than 60% of survey participants were recruited through street outreach (public venues). Participants who completed the survey were offered a \$20 gift card to incentivize participation. All participants who met inclusion criteria were asked to provide verbal informed consent before completing the survey.

Free HIV testing was offered onsite at 50% of the survey administration sites, and referrals for HIV testing were given to survey participants at the sites where HIV testing was not offered. Overall, 27% of respondents accepted onsite testing or referral for testing. No significant difference in acceptance or referral was noted by nativity (25.2% of U.S.-born and 28.3% of non-U.S.-born).

Measures

Survey design. A survey covering six domains (demographics, HIV knowledge, stigma, barriers to HIV testing, risk behavior, and health care access) was developed by the study team. The survey included questions about immigration, language, socioeconomic, HIV knowledge, testing history, sexual practices/history, etc. Validated questions from existing instruments were used to assess HIV knowledge and stigma. Questions that were not included in existing instruments were created by the study team and piloted (see Independent Variables). Demographics, such as age, gender, marital status, and current living circumstances, were also assessed.

The 30-min long survey was designed to be self-administered and anonymous (no identification numbers or identifying information included). The survey, consent form and participant information material were available in six languages (English, Spanish, Haitian Creole, Cape Verdean Creole, French, and Arabic) to reflect the linguistic diversity among Massachusetts non-native black population.

Dependent variable. The question "When was your most recent HIV test (approximately)?" was used to code the dependent variable or outcome of interest. Those who responded "within the past one year" were coded as having a HIV test in the past year and those that responded that their last HIV test was 1–5 years ago, 5–10 years ago,

or 10–20 years ago were categorized as not having a test in the past year.

Independent variables. The evaluated independent variables included demographics (age at time of completing the survey; gender, marital status), socioeconomic (annual family income, employment status, educational attainment), health care access (reported visiting a health care provider in the past 12 months), HIV risk (men who have sex with men or MSM risk, ever used drugs, ever used/shared needle for drugs, condom use), and information specific to the foreign born population (length of time since immigration to the United States and primary language spoken in the home). Two indices were calculated using questions included in the survey and explored as independent variables in regression models: the HIV knowledge score and the HIV stigma index. Several validated scales that measure HIV-related stigma exist and have been used in a domestic as well as international populations.^{27,28} Questions included in this study's survey were based on work done by Herek and Capitanio²⁹ and measured respondents' negative feelings, attitudes about coercive public policies, blame, and avoidant behaviors related to HIV. The stigma index is a continuous variable summing respondents' stigmatizing responses. The HIV knowledge score was calculated using the brief HIV Knowledge Questionnaire (HIV-KQ-18) developed by Carey and Schroder,³⁰ with possible scores ranging from 0% to 100%. This tool was validated in lower income, lower literacy men and women in the United States and was used to assess understanding of basic HIV knowledge including transmission factors, prevention methods and HIV testing modalities. Three additional items were added to the HIV-KQ-18: "Having untreated sexually transmitted diseases like gonorrhea and chlamydia will increase a person's risk of contracting HIV"; "There are medications available to stop babies from getting HIV from HIV positive mothers during pregnancy"; and "Most people who are infected with HIV and do not get treatment progress to AIDS." All three indices had acceptable reliability in this study population (Cronbach α : HIV knowledge, 0.7 and HIV stigma, 0.8) and were dichotomized for analysis based on median splits (stigma: <27 versus $\geq$ 27; knowledge: <80% versus $\geq$ 80%).

Data analysis

Descriptive statistics were used to summarize the survey data overall and by nativity (non-U.S.-born versus U.S.-born). Continuous variables were generally recoded as categorical variables for analysis. Summary statistics for categorical variables, such as gender, were presented as frequency counts and percentages. Differences in characteristics between U.S.-born and non-U.S.-born respondents were compared using χ^2 statistics ($p < 0.05$ indicating significant differences).

To address the first study objective, prevalence of HIV testing in the past year was estimated overall and then by nativity. We hypothesized that the non-U.S.-born population would have lower testing rates than the U.S.-born population. In addition, we evaluated differences by birthplace (and among the foreign born, by place of birth) on the two HIV indices. We hypothesized that the non-U.S.-born population would report higher levels of stigma and have lower

knowledge scores than US born respondents, which could potentially impact their testing rates.

Bivariate and multivariate logistic regression models were used to identify correlates to HIV testing for the non-U.S.-born population versus the U.S.-born population (second study objective). Reference groups for the independent variables were selected to identify groups that had lower odds of being tested in the past year. Bivariate regression models described the crude relationship between the independent variables and dependent variable, producing crude odds ratios (OR) and 95% confidence intervals that were not adjusted for any potential confounders.

The multivariate logistic regression models included independent variables that were significant in the bivariate models and/or were potential confounders (e.g., single marital status, language for the foreign born) based on evidence from prior research. Further, we attempted to include similar independent variables in the models for both non-US born and US born subgroups. We assessed correlations between independent variables before modeling to rule out collinearity. If two independent variables were highly correlated, only one was included in the multivariate model. The multivariate regression analyses produced adjusted odds ratios and 95% confidence intervals, controlling for all other independent variables (i.e., potential confounders) included in the model. Models were built separately for the non-U.S.-born population and the U.S.-born population and results were compared. The final model for the non-U.S.-born population was based on 568 individuals (with available information on HIV testing and the independent variables) and included: age, gender, marital status, annual family income, having visited a health care provider in the past 12 months, length of time since moved to the U.S., and primary language spoken in the home. A similar model was built for the U.S.-born population ($n=434$ with available information on the dependent and independent variables): age, gender, marital status, annual family income, and having visited a health care provider in the past 12 months. All statistical analyses conducted in SAS version 9.2 (SAS Institute, Inc., Cary, NC).

For quality control, all surveys were reviewed after submission and surveys with more than 5% of responses (six questions) missing (excluding questions regarding personal sexual history) were eliminated from analysis. Data were entered into an Access database designed for this study. A 10% sample was randomly selected and double entered by a different research assistant to check whether inconsistencies were concentrated in particular areas of the questionnaire. All inconsistencies were resolved by reexamination of the data.

Results

Characteristics of the sample

Approximately 80% of those approached agreed to participate in the survey. Of the 1060 respondents, 57% (607) were non-U.S.-born (Table 1). The majority (74.7%) of the non-U.S.-born subgroup had moved to the United States more than 5 years ago and 56% emigrated more than more than 10 years ago. Fifty-six percent were from sub-Saharan Africa, while 40% were from the Caribbean, primarily from Haiti (63% of Caribbean subgroup). Only 2.7% of those interviewed reported their immigration status to be undocumented. Fifty-five different countries of origin were reported.

Compared to those born in the United States, non-U.S.-born respondents were more likely to be male (53% versus 43%, $p=0.001$), employed (68% versus 50%, $p<0.0001$), report a household income of \$50,000 or more (25% versus 14%, $p<0.0001$), and have a 4-year college degree or more education (34% versus 19%, $p<0.0001$). Non-U.S.-born individuals were less likely to be young (18–24 years: non-U.S.-born, 15% versus U.S.-born, 21%, $p=0.02$) and single (50% versus 74%, $p<0.0001$). In terms of health care access, those born outside of the United States were less likely to have health insurance (80% versus U.S.-born, 87%, $p=0.03$) and less likely to report seeing a health care provider in the past 12 months (76% versus U.S.-born, 87%, $p<0.0001$).

In regards to risk for contracting HIV, non-U.S.-born respondents were less likely to report MSM risk (1% versus 8%, $p<0.0001$), ever using drugs (4% versus 30%, $p<0.0001$), and ever using or sharing needles for cocaine and/or heroin use (2% versus 10%, $p<0.0001$). U.S.-born respondents were more likely to report always or sometimes using condoms during sexual encounters than non-U.S.-born respondents (34% versus 25%, $p=0.002$). Non-U.S.-born respondents were less likely to report having sex (vaginal or anal) in the last 3 months (77% versus 86%, $p=0.001$). Twenty-three percent of both groups refused to answer questions regarding sexual activity. Three percent of the 908 individuals who reported previous HIV testing and responded to “What was your test result?” reported that they were positive, and this did not significantly differ by place of birth.

Prevalence of HIV testing

Overall, 48% of the study population reported having had a HIV test in the past year. Non-U.S.-born individuals were less likely to report a recent HIV test (42% versus U.S.-born 56%, $p\leq 0.05$; Fig. 1). Non-U.S.-born respondents from sub-Saharan Africa reported similar HIV testing rates to Caribbean born respondents (43% and 41% in the past year, respectively). A higher percent of non-U.S.-born respondents reported their last test occurred more than 5 years ago (15% versus than U.S.-born 7%, $p=0.05$), and a similar proportion of U.S.-born and non-U.S.-born individuals reported never having been tested for HIV (15% each). Over half (54%) of the non-U.S.-born respondents reported that their most recent HIV test was obtained as a requirement for their current immigration status. Among single individuals, few tested because they felt that they were at risk for HIV infection (12.8% and 5.8%, non-U.S.-born males and females, respectively).

With respect to time since arriving in the United States and testing, 64% of those who immigrated to the United States in the past year were tested in the past year. Only half (51%) of those who immigrated to the United States in the past 2–5 years were tested in the past year and a little over one third (37%) of those that moved to the United States 5 or more years ago were tested in the past year.

Scores on HIV-specific indices

Two HIV specific indices were calculated based upon survey responses: the HIV stigma score and the HIV knowledge score. In terms of HIV knowledge, a higher percentage of non-U.S.-born respondents scored low than U.S.-born respondents (low score: <80% correct; 51% versus 38%; $p<0.0001$; Table 2). A significantly higher percent of

TABLE 1. CHARACTERISTICS OF THE SURVEY SAMPLE BY NATIVITY (U.S.-BORN VS. NON-U.S.-BORN)

	U.S.-born (n=453)		Non-U.S.-born (n=607)		p Value ^a
	n	%	n	%	
Age (in years)					
18–24	92	20.6%	90	15.2%	0.02
25–34	108	24.2%	165	27.9%	NS
35–49	135	30.2%	213	36.0%	0.049
50 or older	112	25.1%	123	20.8%	NS
Gender					
Male	195	43.1%	322	53.1%	0.001
Female	252	55.8%	283	46.7%	0.004
Transgender	5	1.1%	1	0.2%	NS
For non-U.S.-born					
>5 years since moved to the United States	NA	NA	428	74.7%	—
English is primary language spoken	NA	NA	253	42.4%	—
Single marital status	330	73.8%	300	50.1%	<0.0001
Employed	224	49.7%	412	68.1%	<0.0001
Annual family income					
<\$20,000	207	45.7%	180	29.7%	<0.0001
\$20,000–\$49,999	134	29.6%	169	27.8%	NS
≥\$50,000	64	14.1%	149	24.5%	<0.0001
Missing/Refused/Don't know	48	10.6%	109	18.0%	0.0008
Education status					
Less than high school	71	15.8%	73	12.1%	NS
High school grad/some college	290	64.7%	326	53.9%	0.0004
College grad/graduate school	87	19.4%	206	34.0%	<0.0001
Seen a health care provider in past 12 months	391	86.5%	459	75.9%	<0.0001
Men who have sex with men (MSM)	27	8.0%	5	1.2%	<0.0001
Ever used drugs (cocaine, heroin, meth)	135	30.1%	21	3.5%	<0.0001
Ever used or shared needles for cocaine/heroin	46	10.3%	11	1.8%	<0.0001
Condom use					
Always/sometimes used condoms	152	33.6%	152	25.0%	0.002
Never used condoms	106	23.4%	114	18.8%	NS
Had sex but didn't report condom use	44	9.7%	98	16.1%	0.002
No sex	49	10.8%	106	17.5%	0.002
No response to sex questions	102	22.5%	137	22.6%	NS

^aDifferences between U.S.-born and non-U.S.-born significant at $p < 0.05$.

NA, not available; NS, not significant.

Caribbean born respondents (60%) scored low compared to sub-Saharan African respondents (45%; $p = 0.004$). On the HIV stigma scale, a significantly higher percent of non-U.S.-born respondents (58%) had a high stigma score than U.S.-born respondents (44%; $p < 0.0001$). Caribbean born respondents (65%) were more likely to score high on the stigma index than sub-Saharan African respondents (52%; $p = 0.0002$). While there were significant differences by place of birth for non-U.S.-born respondents regarding HIV knowledge and stigma scores, there was no significant difference in testing prevalence between African-born and Caribbean-born respondents.

Correlates to HIV testing: non-U.S.-born compared to U.S.-born

For non-U.S.-born respondents, bivariate logistic regression analyses revealed that older age (35- to 49-year-olds [OR: 0.52; 95% CI: 0.34–0.79] and ≥50 [OR: 0.25; 95% CI: 0.15–0.42]), not having seen a health care provider in the past 12

months (compared to having seen a provider, OR: 0.62; 95% CI: 0.42–0.92), and living in the United States for more than 5 years (compared to 1 year or less, OR: 0.43; 95% CI: 0.26–0.69) were less likely to be tested for HIV in the past year (Table 3). Other independent variables, including the two HIV indices (knowledge and stigma), were not related to HIV testing in bivariate models.

In multivariate regression analyses, similar relationships were observed. Controlling for all other independent variables, individuals in older age groups were less likely to be tested for HIV in the past year (35–49 years [AOR: 0.53; 95% CI: 0.34–0.83] and 50 or more years [AOR: 0.23; 95% CI: 0.13–0.41]). There was no difference in the odds of being tested for those 18- to 24-year-olds compared to 25- to 34-year-olds in the multivariate model. Furthermore, respondents that reported not having seen a health care provider in the past year were less likely (AOR: 0.58; 95% CI: 0.38–0.90) to be tested than those that reported having seen a provider. Finally, non-U.S.-born respondents who moved to the United States greater

FIG. 1. Prevalence of HIV testing in the past year: U.S.-born versus non-U.S.-born. Differences are significant at $p < 0.05$ for all categories except “Never”.

than 5 years ago were half as likely to be tested in the past year than respondents who moved to the United States in the past year (AOR: 0.43; 95% CI: 0.25–0.76).

For U.S.-born respondents, bivariate logistic regression analyses revealed that age greater than 50 (OR: 0.41; 95% CI: 0.24–0.71), female (OR: 0.63; 95% CI: 0.43–0.92), family income greater than \$50,000 (OR: 0.54; 95% CI: 0.31–0.96), and not having seen a health care provider in the past 12 months (compared to having seen a provider, OR: 0.45; 95% CI: 0.26–0.79) were less likely to be tested for HIV in the past year. All of which remained significant in multivariate analysis.

Discussion

This study explored HIV testing patterns among non-U.S.- and U.S.-born black individuals and investigated barriers to

accessing HIV testing, such as inadequate HIV knowledge and stigma. Disaggregating the black population in the United States for the purposes of understanding behavior is a complicated undertaking. Significant diversity exists within immigrant communities. As noted, more than 50 countries of origin were represented in this study. While some immigrants have undergone degrees of acculturation, many have made efforts to maintain their indigenous culture, religions, and native languages. Therefore, formulating generalizable conclusions is challenging. However, determining whether or not black individuals living in the United States who are at risk for HIV infection are similar in terms of risk factors, behaviors, or testing patterns is important, and findings should drive the development of appropriate strategies to improve access to services. This study found that salient differences, as well as similarities, do exist between non-U.S.-born blacks and U.S.-born blacks.

TABLE 2. PREVALENCE OF BARRIERS TO HIV TESTING, HIV KNOWLEDGE, AND HIV STIGMA BY NATIVITY (U.S.-BORN VS. NON-U.S.-BORN OVERALL, SUB-SAHARAN AFRICAN, AND CARIBBEAN, INCLUDING HAITI)

	Non-U.S.-born								p Value ^a
	U.S.-Born (n = 453)		Overall (n = 607)		Sub-Saharan Africa (n = 341)		Caribbean (n = 240)		
	n	%	n	%	n	%	n	%	
Tested for HIV in past year	255	56.3%	252	41.9%	145	42.8%	98	41.4%	<0.0001
HIV knowledge score ^b									
Low	173	38.2%	309	50.9%	153	44.9%	145	60.4%	<0.0001
High	280	61.8%	298	49.1%	188	55.1%	95	39.6%	
HIV stigma index ^c									
Low	235	55.6%	232	42.3%	148	47.6%	74	34.7%	<0.0001
High	188	44.4%	316	57.7%	163	52.4%	139	65.3%	

^aDifferences between U.S.-born and non-U.S.-born significant at $p < 0.05$.

^bDichotomized based on median split (low score, <80%; high score, ≥80%).

^cDichotomized based on median split (low score, <27; high score, ≥27).

TABLE 3. RESULTS FROM MULTIVARIATE LOGISTIC REGRESSION ANALYSES FOR HIV TESTING IN THE PAST YEAR: U.S.-BORN VS. NON-U.S.-BORN MODELS: REPORTING ADJUSTED ODDS RATIOS AND 95% CONFIDENCE INTERVALS

	U.S.-born (n=568) Multivariate AOR (95% CI)	Non-U.S.-born (n=434) Multivariate AOR (95% CI)
Age (Ref. 25–34 years)		
18–24	0.61 (0.33–1.14)	0.65 (0.37–1.15)
35–49	1.07 (0.60–1.88)	0.53 (0.34–0.83)
50 or older	0.38 (0.21–0.69)	0.23 (0.13–0.41)
Gender (Ref. male)		
Female	0.55 (0.36–0.83)	1.24 (0.86–1.78)
Marital status (Ref. single)		
Married/widowed/other	0.73 (0.45–1.18)	1.18 (0.80–1.74)
Annual family income (Ref. <\$20,000)		
\$20,000–\$49,999	0.64 (0.39–1.03)	0.77 (0.47–1.24)
≥\$50,000	0.48 (0.26–0.90)	0.82 (0.49–1.36)
Missing/Refused	1.16 (0.47–2.39)	1.12 (0.66–1.92)
Saw health care provider in past 12 months (Ref. Yes)		
No	0.33 (0.18–0.62)	0.58 (0.38–0.90)
Length of time since moved to U.S. (Ref. 1 year or less)		
Greater than 1–5 years	NA	0.57 (0.30–1.09)
Greater than 5 years	NA	0.43 (0.25–0.76)
Primary language spoken in home (Ref. English)		
Language other than English	NA	0.80 (0.55–1.16)

AOR, adjusted odds ratio; CI, confidence interval; NA, not available.

Our results show that non-U.S.-born blacks have a lower rate of recent HIV testing than U.S.-born blacks. More than half of the non-U.S.-born individuals surveyed were tested to obtain their current immigration status, as opposed to consenting to testing offered by a health care provider or seeking out testing at a publicly funded test site because they felt that they were at risk of infection. Non-U.S.-born individuals in this study who have lived in this country for an extended period of time (>5 years) were unlikely to have undergone recent HIV testing. One could postulate that these individuals obtained an HIV test for the purposes of immigration soon after entry and then never tested again. This is concerning because it is likely that risk of infection persists here in the United States. We found condom use to be lower among non-U.S.-born blacks in the subset of individuals who responded to questions regarding sexual behavior. Sexual behavior and risk taking has been explored qualitatively in black immigrant populations. Hoffman et al.³¹ noted expansion of the sexual network and increase in partner number in West Indian immigrants postmigration living in New York City largely due to the sexual freedom afforded by the anonymity of their new environment. Barrett et al.³² explored the “HIV risk environment” of sub-Saharan African (Eritrean and Ethiopian) immigrants in the United Kingdom and found that study participants incorrectly perceived their environment to be low risk. Condom use was infrequent because they assumed that since they were no longer in Africa they were at little or no risk of contracting HIV or other sexually transmitted diseases. It is also important to recognize that many immigrants are vulnerable and often marginalized. As a consequence, they may be victims of sexual exploitation which increases sexually transmitted disease risk. For these reasons, HIV testing and prevention efforts need to extend well beyond the immediate period following entry into the United States.

Our findings may have significant implications now that the U.S. HIV travel ban has been lifted and HIV testing is no longer required for immigration into the United States. Immigration from high HIV prevalence countries in sub-Saharan Africa and Caribbean has continued to increase.³³ Education and advocacy efforts must be initiated to ensure that routine testing practices are implemented. Immigrants should be offered HIV testing and be informed that a positive test will not lead to deportation or other adverse legal circumstance. Immigrants must also be informed that treatment is available. Through the AIDS Drug Assistance Program, the Ryan White Care Act can cover the cost of HIV medications irrespective of immigration status. Health care providers must also be educated and be made aware that immigrants from high prevalence countries are at elevated risk of HIV infection and should be encouraged to test for HIV.

HIV-related stigma has been identified in previous studies as a barrier to HIV testing.^{34–36} Not only may stigma decrease HIV testing, but it may also decrease risk reduction behavior, and lead to delays in accessing care for those who test positive. In this study we found that Caribbean-born individuals (primarily Haitian immigrants) had significantly higher levels of HIV related stigma than U.S.-born blacks and had the highest levels of HIV-related stigma in the study overall. Other studies have found similarly elevated levels of stigma in the Haitian immigrant community in the United States.³⁷ To a lesser degree, high levels of stigma were also found among immigrants from sub-Saharan Africa. Limited empirical data exist that provide insight into African immigrant perceptions regarding HIV. However, a large body of literature exists to support the existence of stigmatizing beliefs in communities studied within sub-Saharan Africa. Interestingly, although HIV related stigma was high in non-U.S.-born populations and stigma has been found to be a barrier to

accessing HIV testing, in this study levels of stigma did not predict self-reported testing. We propose two reasons for this finding. First, the majority of the non-U.S.-born respondents immigrated to this country prior to the lifting of the HIV travel ban and were forced to undergo HIV testing to become permanent residents. Therefore, irrespective of their own internal biases they were required to submit to HIV testing. Second, the scale utilized in this study developed by Herek and Capitanio²⁹ was designed to measure stigmatizing attitudes and beliefs concerning AIDS. The questions primarily assess *external* stigma (negative feelings toward people living with HIV, beliefs that they deserved their illness, support for punitive HIV policies, etc.). Several recent studies that have found HIV related stigma to be a barrier to HIV testing have used scales that measure “anticipated stigma,” which refers to the anticipation that one will personally experience specific types of discrimination if one’s test is positive.^{38,39} Other studies have used similar measures to assess the potential of personal or *internal* stigma and found similar correlation to HIV testing patterns.³⁴ The lack of measurement of anticipated or internal stigma may also explain why stigma did not predict HIV testing for U.S.-born respondents.

Lack of basic HIV knowledge (transmission routes, treatment availability, sexually transmitted disease cofactors) may limit one’s ability to prevent infection and access HIV related services. Since the beginning of the epidemic, the CDC has invested in public health campaigns to improve HIV knowledge and awareness domestically and also decrease stigma and discrimination. In addition, the U.S. government has spent millions of dollars in sub-Saharan Africa and the Caribbean through the President’s Emergency Plan for AIDS Relief (PEPFAR) on HIV education, knowledge and advocacy. Yet, in this study, we found that HIV knowledge remains low amongst black immigrants with more than 50% of non-U.S.-born individuals receiving a low knowledge score. More efforts need to be undertaken to develop messages that reach diverse immigrant communities. This work is complicated by the cultural and linguistic diversity within these communities.

For both U.S.-born and non-U.S.-born individuals, older individuals were less likely to report a recent history of HIV testing. Older individuals of all races and ethnicities have been overlooked in HIV testing campaigns. Yet, seroprevalence data indicate that risk of HIV infection continues in older individuals. Of new HIV/AIDS cases reported to the Centers for Disease Control and Prevention in 2009, over 15% were in persons 50 years and older while nearly 2% of new diagnoses were in patients over 65 years of age.³⁹ Late testing may be more common in this population because older individuals may be less likely to discuss behavioral risk with their health providers, and infrequently seek out HIV testing.

Although nontraditional methods of testing outreach have expanded, poor access to health care providers still often equals poorer access to HIV testing. In this study, not seeing a health care provider within the previous 12 months was found to be a predictor of lack of recent HIV testing for all respondents. Therefore, access to health care is an important predictor of HIV testing for both populations studied. In 2006 Massachusetts mandated that all residents have health insurance. Although non-U.S.-born individuals in this study reported lower levels of health insurance than U.S.-born respondents, overall levels were high. However, having health insurance is just one component of health care access. Patients

must understand how to navigate the health care system, must have access to providers who are culturally competent, and must know that regular health care access is important to maintain and improve overall well-being. Efforts to ensure universal access to health care need to be continued and promoted. For immigrant populations, decreasing fears associated with interactions with the health care system and the possibility of being questioned about immigration status is critical.

This study has several limitations. Data obtained via convenience sampling contains inherent bias and may not be generalizable. However, probability sampling to randomly capture hard to reach individuals (such as non-U.S.-born black individuals) who may be transient, undocumented, refugees, or asylees may not have been feasible. In addition, street outreach allowed for expeditious recruitment of a sample from diverse countries of origin. Second, our dependent variable was assessed by self-report, as opposed to determination from an objective source, such as a medical record. Self-report of HIV testing is subject to recall bias and tends to overreport actual HIV testing.^{40,41} Patients often assume that they have undergone HIV testing as a component of a routine evaluation when it has not occurred. However, because of our desire to capture individuals who may not access health care and have a record of testing available we chose to assess HIV testing by self-report. In addition, our sample included a small number of undocumented individuals. We asked respondents to tell us their immigration status and determined that less than 3% of the sample was undocumented. This is highly sensitive information, and it is likely that respondents were unwilling to report their actual immigration status or were unwilling to participate in the survey. Undocumented persons may have additional barriers to accessing HIV testing and likely have a lower rate of HIV testing. We also asked sensitive sexual questions and as mentioned the nonresponse rate was high. During survey administration we also experienced a number of potential participants who refused to complete the survey when they encountered the sexual behavior questions. In our effort to minimize non-response bias we did not eliminate these individuals from the analysis. But lack of response may have limited our ability to fully understand sexual behavior difference between the two populations.

Disparities by race and ethnicity in HIV seroprevalence have persisted since the beginning of the epidemic in the United States. In order to overcome these disparities there is an ongoing need to develop strategies that effectively address behavioral risk factors and improve access to HIV prevention and testing services, particularly in high risk populations. Our study explored differences in HIV testing patterns, knowledge and stigma in non-U.S.-born and U.S.-born black populations. We found that non-U.S.-born individuals are less likely to be recently tested for HIV infection and that length of time since initial immigration is a predictor of not having had a recent HIV test. Our findings suggest that work remains to be done to increase HIV testing in immigrant populations. HIV related stigma needs to be addressed and HIV knowledge needs to be increased. Although neither predicted recent HIV testing in this study, we believe that both are important and will become more so as immigrants are given the choice to accept or refuse HIV testing.

Author Disclosure Statement

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