HIV Testing Behaviors Among Latinos in Baltimore City

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Abstract In the US, HIV disproportionately affects Latinos who often present late in the disease. Baltimore has seen a recent rapid growth in its Latino population paralleled by an increasing impact of HIV/AIDS among Latinos. From 2009 to 2010, we performed a cross-sectional survey of Latinos accessing the Baltimore City Health Department (BCHD) Latino Outreach services to assess self-report of previous HIV testing, with particular attention to migration history and risk behaviors. Of 247 Latinos (46% male) accessing BCHD outreach services, 96% were foreign-born. Self-perceived HIV risk was not associated with actual risk behaviors or HIV testing. In multivariate models, previous HIV testing was correlated with knowledge of HIV transmission modes and knowing that a person with HIV can appear healthy. Consistent with CDC recommendations, HIV screening among Latino immigrants should not be limited to individuals with self-perceived risk for HIV. Promoting key pieces of HIV knowledge may improve HIV testing behaviors.

Keywords HIV/AIDS · Prevention · Hispanic · Latino · Condom · HIV knowledge · HIV testing

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Introduction

Over the last decade the number of new HIV infections per year in the United States has remained stagnant at approximately 50,000 annual infections [1, 2]. The Centers for Disease Control and Prevention (CDC) estimates that 25% of people living with HIV are unaware of their serostatus, and these persons account for more than 50% of all new infections [2]. As a result, in 2006, the CDC recommended routine opt-out HIV testing for everyone aged 13–64 years in any healthcare setting [3]. Unfortunately, implementation and uptake of these recommendations has been slow. HIV testing rates are still relatively low, and many people remain diagnosed late in the course of disease [4].

Latinos have been disproportionately affected by the HIV/AIDS epidemic in the United States, constituting 15% of the US population, but accounting for 17% of new HIV diagnoses [5]. In addition, Latinos are often diagnosed late in the course of HIV disease [6–12], with 58% of AIDS cases among Latinos occurring within one year of HIV diagnosis [11]. Several factors lead to late diagnosis among Latinos. Healthcare access and access to HIV testing is often limited, particularly for foreign-born Latinos who have the highest risk of late presentation to HIV care. Other factors such as low levels of HIV knowledge [13] and low self-perception of HIV risk [14] can contribute to low testing rates. Furthermore, risk behavior and access to HIV care varies among Latinos, depending on their country of origin, cultural norms and practices [14, 15].

The Latino population is the fastest growing population in the US, accounting for more than half of the total US population growth [16]. Both the Midwest and the South have been experiencing significant increases in their Latino populations, with the greatest growth seen in the South

with a 57% increase in its Latino population [16, 17]. Between 2000 and 2010, eight states in the South, including Maryland, have doubled their Latino population [16], and Baltimore city has followed this trend [18]. In the South and Midwest, Latinos are not joining well-established Latino communities like those in California or New York. Instead, these relatively new settlement areas are comprised of mainly young, foreign-born, poorly-educated, single male migrants [17, 19]. As compared to well-established cultural enclaves, these communities of recently immigrated Latinos pose different challenges to HIV education and risk behavior reduction efforts.

Over the last decade, the Latino population in Baltimore City has more than doubled, primarily due to the influx of recent migrants from Central America and Mexico [18, 20]. As in other areas of the country without historically large Latino communities, culturally-sensitive healthcare initiatives are not readily available, leading to significant barriers in access to basic services and disparities in care. Consequently, from 1996 to 2006 although incident AIDS cases decreased among non-Hispanic blacks and whites, AIDS incidence and HIV/AIDS mortality nearly doubled among Latinos living in Baltimore [21]. In 2008, in response to the growing need for culturally-sensitive services for the Latino population, the Baltimore City Health Department (BCHD) established a Latino Outreach Program staffed by Spanish-speaking community workers to provide HIV education and voluntary counseling and testing (VCT) in the Latino community.

When the BCHD Latino Outreach Program was first rolled out, its effectiveness was unknown. Outreach efforts were fashioned after the methods used to reach the non-Hispanic black and white community members and outreach program intake sheets used for HIV and syphilis screening were the same forms used for non-Hispanic populations, but translated into Spanish and administered by bilingual outreach workers. Initial analysis of the first four hundred Latino clients served showed low HIV testing rates with only 37% reporting that they had ever been tested for HIV [22]. Female gender, young age, and low educational level were associated with never having had an HIV test [22]. This assessment revealed the need for a gender-specific as well as culturally acceptable venue for HIV testing among women. In addition, because the data analysis was limited to the information collected from the BCHD outreach program intake forms, we realized that we still needed additional descriptive information on risk profiles of Latinos accessing the BCHD outreach services to better inform outreach priorities.

Since Latinos are disproportionately affected by HIV and often diagnosed late in the course of the disease, HIV testing services are an important method to educate the community about the impact of HIV, diagnose individuals earlier with the disease, and engage individuals in care when necessary. In this study, we surveyed individuals accessing services provided by the BCHD Latino Outreach Program to understand the general client profile. In particular, we were interested in evaluating whether the BCHD Latino Outreach services were reaching an at-risk Latino population by evaluating factors associated with previous HIV testing. Through this study we hoped to identify strategies to better reach Latinos at risk for HIV in Baltimore and other similar regions experiencing rapid Latino growth.

Methods

We performed a cross-sectional survey of Latino participants accessing the BCHD Latino Outreach services from October 25, 2009 to December 31, 2010.

Study Setting & Procedures

The BCHD Latino Outreach team conducts HIV education and VCT and syphilis screening for the Latino community as described previously [22]. Briefly, the Baltimore City Health Department outreach activities are generally targeted to locations where high-risk behaviors are known to occur. Because less is known about high-risk venues for Latinos, the BCHD Latino Outreach team targets venues with high concentrations of Latino residents and businesses to provide HIV/STI screening for the general Latino population. Typical BCHD outreach sites are Latino community based organizations (CBO), clinics that predominantly serve Latino patients, community fairs, bars, or neighborhoods with a predominance of Latino residences and businesses. The BCHD team is often accompanied by a mobile healthcare van in which two private counseling rooms and phlebotomy services are available. Individuals who agree to services undergo a short standardized BCHD demographic and risk behavior assessment. Test results are followed up as previously described [22].

Between October 25, 2009 and December 31, 2010, participants who accessed BCHD Latino Outreach services were invited to participate in a 20 min face-to-face interview focusing on migration history, acculturation level, HIV risk perception, HIV knowledge, and risk behaviors. All surveys were conducted by a bilingual member of the BCHD Latino Outreach team and care was taken to conduct interviews in private rooms when available or away from crowds. Oral informed consent was obtained and outreach participants were informed that routine BCHD services such as HIV and syphilis testing could still be done if they elected not to participate in this additional survey. Participants were offered $5 gift cards as compensation for time.

These data were collected in the course of routine outreach activities and use of these data for this analysis was approved by the Institutional Review Board of Johns Hopkins Medical Institutions.

Study Instruments

Surveys were designed with the input of the BCHD Latino Outreach team workers. Surveys were translated into Spanish through a collaborative effort of outreach team members who represented Mexican, Uruguayan, and Colombian nationalities to achieve the best understood colloquial translation common to Spanish-speakers in the Baltimore area. In addition, BCHD programmatic outreach data was collected as previously described [22].

Demographic variables included education level, dichotomized at less than high school or some high school and greater. Age was analyzed as a continuous variable and also by 10-year intervals. Participants were categorized as single, including separated, unmarried, or divorced, versus in a committed relationship. Sexual orientation was dichotomized into heterosexual/straight and homosexual or bisexual. Health insurance status was dichotomized as having any health insurance including public health insurance programs and reporting no health insurance. Income was dichotomized as reporting average earnings of greater than $400 per week versus being unemployed or earning less than or equal to $400 per week. Employment was categorized into being stably employed, a day laborer, or unemployed. Survey location was described as street outreach, clinic, Latino CBO, fair, or other (which only included bar or unknown). On further analysis, survey location was dichotomized into bar versus all other sites.

Migration factors included foreign birth and country of origin. Country of origin was categorized into regions that included US and Puerto Rico, Mexico, Central America, South America, and the Caribbean. Because mobility has been associated with inconsistent condom use [23], this was assessed by asking how many cities participants had lived in prior to settling in Baltimore, which was then dichotomized as ≤1 and >1. We assessed living situation by asking how many people were in a household and then dichotomizing this value with greater than four residents per household indicating crowded households. Participants were asked open-ended questions about age at migration and number of years lived in the US. We then categorized age moved to the US by 10-year intervals (≤10, 11–20, 21–30, >30 years-old). We dichotomized years in US at 0–5 years (recent migration) versus >5 years. Acculturation level was also assessed by the brief Acculturation Rating Scale for Mexican–Americans-II (ARSMA-II) [24, 25]. The brief ARSMA-II scale is a 12-item version that highly correlates with the full 30-item ARSMA-II scale

(r = 0.93) [25]. A continuous score was calculated and categorized into five levels: (1) very Mexican oriented, (2) Mexican oriented or balanced bicultural, (3) slightly Anglo oriented bicultural, (4) very Anglo oriented bicultural, (5) Assimilated/Anglicized [26]. Although this scale was designed and validated in a Mexican/Mexican–American population, the majority of the questions reflect Spanish language versus English preference. Therefore, we interpreted "Mexican oriented" as "Mexican/Latino oriented" when the scale was performed in Latinos of non-Mexican origin. Due to the our small sample size and limited spread on the brief ARSMA-II, we further consolidated the categories into "Mexican/Latino oriented" which included levels 1–2, as listed above, and "Anglo oriented" which included levels 3–5.

HIV knowledge was assessed by asking the question, "Can a person who has the HIV virus look, act, and feel healthy?" adopted from the Family Health International Surveys [27]. In addition, participants were asked the open-ended question, "How can you contract HIV/AIDS?" Answers were then quantified based upon the number of correct modes of transmission a participant could name: unprotected sexual transmission, blood transmission, mother-to-child transmission, and injection drug use transmission. Responses were dichotomized by those who knew two or fewer modes of transmission versus those who knew greater than two modes of transmission. Erroneous answers were also quantified and dichotomized into those who stated no incorrect methods of transmission versus those who reported at least one. HIV risk perception was by self-report of being "at risk" of HIV/AIDS versus "no risk" and "don't know." Additionally participants were asked to rate their "chances of getting HIV/AIDS" as low, medium, high, and don't know. Women were also asked if they had been tested for HIV during pregnancy.

Sexual risk behavior questions were adapted from the UNAIDS/MEASURE Evaluation HIV/AIDS Prevention Indicator Survey [28]. Questions on condom use, contraceptive use, and alcohol use were asked pertaining to the most recent sexual act. "High-risk sexual partner" was defined as reporting the last sexual partner was a commercial sex worker, an anonymous partner, or a casual acquaintance. In addition, participants were asked whether they believed their last sexual partner had concurrent partners or if they themselves had concurrent partners. Participants were also asked whether their last sexual partner was Latino versus non-Latino, as a non-Latino partner may be an indicator of sexual network characteristics. Number of sexual partners in the last 12 months was dichotomized at one which is the national median [29]. Regardless of previously reported sexual orientation, men were also asked if they have ever had sex with a man (MSM). "High-risk sexual behavior" in the last 12 months

was defined as any of the following: reporting sex with an injection drug user (IDU), paying for sex or exchanging other goods or services for sex, sex with a commercial sex worker (CSW), self or partner sexual concurrency, sex with a casual or anonymous partner, sex with a transgendered person, having >1 sexual partner in the last 12 months, alcohol use during last sexual encounter, or reporting last partner was a high-risk sexual partner. Less than 100% condom use in the previous 12 months was defined as reporting sex without a condom anytime in the last 12 months or not using a condom during last sexual act. Questions pertaining to alcohol use were adapted from the Family Health International Behavioral Surveillance Surveys, including questions on binge drinking (≥5 drinks in one day for men; ≥4 drinks in one day for women) [27].

The main outcome of interest was history of previous HIV testing. Participants were asked whether they had ever had a previous HIV test and answers were dichotomized into "yes" and "no/don't know."

Statistical Analysis

Descriptive characteristics were ascertained by Chi-squared tests with a P-value <0.05 indicating statistically significant differences. Univariate and multivariate logistic regression analyses were conducted using STATA version 10.0 (College Station, TX). All multivariate logistic regression models were performed using likelihood ratio testing and Akaike's information criterion (AIC) for best fit model with stepwise forward and backward regression method for verification of models. All results were stratified by gender as previous research has shown significant differences in demographic, acculturation, and risk behavior characteristics between Latino men and women [15, 22].

Results

Demographic Profile

Of the 282 surveys that were collected between October 25, 2009 and December 31, 2010, we excluded 25 surveys that were incomplete and another 10 surveys from individuals who reported HIV-positive serostatus, as we were interested in primary prevention of HIV. Final study sample included n = 247 surveys (114 men, 133 women). Table 1 describes general characteristics of the sample. Approximately 96% of the participants were foreign-born, with the majority coming from Central American countries (primarily from El Salvador 19% and Honduras 15%, data not shown). Participants were a mean age of 23.3 years when they moved to the US, and most had been living in the US for an average of 8 years, but remained Mexican/Latino

oriented by the brief ARSMA-II acculturation scale. The majority of Latinos accessing BCHD Outreach services had no high school education. Almost three-quarters of the sample were between the ages of 21–40. Although the majority of Latinos surveyed were employed, they were making less than $400 per week and did not have health insurance. Latino men tended to be single, while Latina women were usually married.

HIV Knowledge, Risk, and Perception of Risk

Regarding HIV knowledge, 19% of participants knew 3–4 correct modes of transmission of the virus, but another 19% incorrectly stated at least one method. Common misconceptions included a reported risk of HIV transmission through kissing and sharing utensils or objects with an HIV-infected person. In addition, 38% of Latinos surveyed did not know that an HIV-infected person can look and feel healthy.

Men were more likely than women to report a condom was used at last sexual encounter and to report condoms used during 100% of the sexual encounters over the last 12 months. Men, however, were also more likely to have other HIV risk behaviors such as partner concurrency, a high-risk sexual partner, binge alcohol use, and drug use. Table 2 shows the relationship between HIV risk perception (self-reported at-risk vs. no-risk of HIV) and actual risk behaviors, stratified by gender. Men who reported having any high-risk sexual behavior and binge drinking in the last 12 months were more likely to believe that they might be at-risk for HIV/AIDS. However, a large proportion of men who said they had no risk of acquiring HIV reported risk behaviors that included inconsistent condom use (70%), having had more than 1 partner in the last year (48%), or other high risk sexual behaviors (62%). Women were less likely to perceive themselves at risk for HIV than men (32 vs. 43% respectively, $P = 0.08$) and no risk behaviors were significantly associated with self-perception of risk. However, prevalence of self-reported risk behaviors among women was low and may have hindered meaningful analysis. Previous HIV testing was not associated with self-perception of risk in either men or women.

Previous HIV Testing

Overall, more women (71%) than men (53%) had been previously tested for HIV ($P = 0.004$) (Table 1). Tables 3 and 4 show factors associated with previous HIV testing among Latino men and women, respectively. Men who accessed Latino Outreach services at a bar were less likely to have been previously tested for HIV. Women who were living with relatives had a higher likelihood of having a previous HIV test. Among both men and women, HIV

Table 1 Baseline characteristics of Latinos accessing BCHD outreach services by gender

	Men, n = 114	Women, n = 133	Total	P-value
Demographics				
≤8th grade education	73 (64.0%)	78 (58.7%)	151 (61.1%)	0.39
Age				
≤20	12 (10.5%)	6 (4.5%)	18 (7.3%)	0.29
21–30	44 (38.6%)	50 (37.6%)	94 (38.1%)	
31–40	38 (33.3%)	48 (36.1%)	86 (34.8%)	
>40	20 (17.5%)	29 (21.8%)	49 (19.8%)	
Single	65 (57.0%)	49 (36.8%)	114 (46.2%)	0.002
Homosexual/bisexual	4 (3.5%)	4 (3.0%)	8 (3.2%)	0.82
No health insurance	99 (86.8%)	104 (78.2%)	203 (82.2%)	0.08
Income				
Unemployed/don't know	19 (16.7%)	51 (38.3%)	70 (28.3%)	0.001
≤$400	67 (58.8%)	61 (45.9%)	128 (51.8%)	
>$400	28 (24.6%)	21 (15.8%)	49 (19.8%)	
Employment				
Employed	78 (68.4%)	79 (59.4%)	157 (63.6%)	<0.001
Day laborer	21 (18.4%)	4 (3.0%)	25 (10.1%)	
Unemployed	15 (13.2%)	50 (37.6%)	65 (26.3%)	
Site of survey				
Street	17 (14.9%)	14 (10.8%)	31 (12.7%)	<0.001
Clinic	26 (22.8%)	47 (36.1%)	73 (29.9%)	
Latino community based organization	33 (29.0%)	44 (33.9%)	77 (31.6%)	
Fair	14 (12.3%)	21 (16.1%)	35 (14.3%)	
Other (bar, unknown)	24 (21.0%)	4 (3.1%)	28 (11.5%)	
Migration factors				
Foreign-born	111 (97.4%)	125 (94.0%)	236 (95.6%)	0.2
Country of origin				
US & Puerto Rico	5 (4.4%)	9 (6.8%)	14 (5.7%)	0.2
Mexico	33 (28.9%)	36 (27.1%)	69 (27.9%)	
Central America	66 (57.9%)	65 (48.9%)	131 (53.0%)	
South America	5 (4.4%)	16 (12.0%)	21 (8.5%)	
Caribbean	5 (4.4%)	7 (5.3%)	12 (4.9%)	
Lived in another US city before Baltimore	49 (43.0%)	60 (45.1%)	109 (44.1%)	0.74
Does not live with spouse (if married)	N = 51	N = 96	N = 147	<0.001
	18 (35.3%)	9 (9.4%)	27 (18.4%)	
Crowded housing (>4 residents/household)	65 (57.0%)	51 (38.4%)	116 (47.0%)	0.003
Lives with other family/relatives	69 (60.5%)	121 (91.0%)	190 (76.9%)	<0.001
Age when moved to US				
≤10	6 (5.3%)	10 (7.5%)	16 (6.5%)	0.54
11–20	41 (36.0%)	39 (29.3%)	80 (32.4%)	
21–30	45 (39.5%)	51 (38.4%)	96 (38.9%)	
>30	22 (19.3%)	33 (24.8%)	55 (22.3%)	
Years in the US, mean (SD)	7.92 (6.16)	8.30 (5.97)	8.13 (6.05)	0.29
Years in US: 0–5 years	54 (47.4%)	54 (40.6%)	108 (43.7%)	
Years in US: >5 years	60 (52.6%)	79 (59.4%)	139 (56.3%)	
Acculturation scale				
More Anglo oriented	33 (28.9%)	32 (24.1%)	65 (26.3%)	0.39
More Mexican/Latino oriented	81 (71.1%)	101 (75.9%)	182 (73.7%)	

Table 1 continued

	Men, n = 114	Women, n = 133	Total	*P*-value
HIV knowledge				
Can a person with HIV look healthy?				
No/Don't know	43 (37.7%)	51 (38.4%)	94 (38.4%)	0.92
HIV transmission knowledge				
Incorrectly stated at least 1 method	22 (19.3%)	26 (19.6%)	48 (19.4%)	0.96
Knows 3–4 correct modes of transmission	25 (21.9%)	23 (17.3%)	48 (19.4%)	0.36
Believes is at risk of contracting HIV/AIDS	49 (43.0%)	43 (32.3%)	92 (37.3%)	0.08
Previously tested for HIV	60 (52.6%)	94 (70.7%)	154 (62.4%)	0.004
HIV tested during pregnancy	n/a	77 (67.5%)	n/a	
Sexual behaviors and risk behaviors				
High-risk sexual partner (last sexual act)	22 (19.3%)	2 (1.5%)	24 (9.7%)	<0.001
Last sexual partner was non-Latino	26 (23.0%)	18 (13.5%)	44 (17.9%)	0.05
Condom used at last sexual encounter	55 (48.3%)	28 (21.1%)	83 (33.6%)	<0.001
Reports 100% condom use, last 12 months	36 (31.6%)	12 (9.0%)	48 (19.4%)	<0.001
Alcohol used at last sexual encounter	22 (19.3%)	12 (9.0%)	34 (13.8%)	0.02
Believes partner has concurrent partners	35 (30.7%)	18 (13.5%)	53 (21.5%)	0.001
Reports self has concurrent partners	33 (29.0%)	7 (5.3%)	40 (16.2%)	<0.001
High-risk sexual behavior, last 12 months	80 (70.2%)	33 (24.8%)	113 (45.8%)	<0.001
Ever had sex with a man (for men)	5 (4.6%)	n/a	n/a	
Binge alcohol use, last 12 months	62 (54.4%)	20 (15.0%)	82 (33.2%)	<0.001
Any drug use, last 12 months	33 (29.0%)	7 (5.3%)	40 (16.2%)	<0.001

High-risk sexual partner: reports last partner was a commercial sex worker, anonymous partner, or casual acquaintance. *High-risk sexual behavior*: in last 12 months reports at least one of the following: >1 sexual partner, concurrency, sex with a commercial sex worker, sex with a casual partner, sex with anonymous partner, sex with IDU, paying for sex or exchanging sex for drugs or goods, or sex with a transgendered person

knowledge correlated testing rates. Men who knew >2 correct methods of transmission and that an HIV-infected person can look, feel, and act healthy had increased likelihood of testing (AOR 4.4 and 3.5, respectively). Women who had incorrect knowledge of HIV transmission had decreased likelihood of testing (AOR 0.36), but, as with men, knowing that an HIV-infected person can look, feel, and act healthy increased likelihood of testing (AOR 3.2).

Discussion

The BCHD Latino Outreach Program, established in 2008, was the first culturally-sensitive community program to provide free HIV testing and counseling in Spanish to Baltimore City Latinos. In 2008, initial assessment of the BCHD Latino Outreach Program showed a low prevalence of HIV testing that presumably reflected previous barriers in accessing existing VCT services that were not adapted for non-English speaking clients [22]. This current study expands on the information from the previous study by providing detailed information on the socioeconomic, cultural, and migration profile of those accessing BCHD

Outreach services. We found that the sociodemographic profile of Latino clients accessing services is similar to those of new Latino communities emerging in the Midwest and South. Encouragingly, the proportion of those who had previously tested for HIV increased from 37% in 2008 to 62% 2009–2010. Although the BCHD Latino Outreach team has now improved its services to women, some hard-to-reach populations, such as men-having sex with men (MSM) and bar patrons, are still not accessing many of the BCHD services. We also identified specific HIV knowledge deficits associated with lack of HIV testing; these could be used to develop targeted educational messages that may improve HIV testing among newly established communities of Latinos.

The majority of Latinos accessing BCHD are similar to new migrant populations in other Southern states in that they are mostly young, with minimal formal education, foreign-born, and most men are single [17, 23]. Unlike the national Latino population in which over 63% report Mexican origin [16], Latinos accessing BCHD services were predominantly from Central America. Although 56% reported living in the US for >5 years, most were more Mexican/Latino-oriented in terms of acculturation. Men

Table 2 HIV risk perception, stratified by gender

	Men n = 114				Women n = 133			
	No risk, n = 65	At risk, n = 45	Total	P-value	No risk, n = 90	At risk, n = 43	Total	P-value
High-risk partner, last sexual encounter	9 (13.9%)	13 (26.5%)	22 (19.3%)	0.09	0	2 (4.7%)	2 (1.5%)	0.04
Condom used at last sexual encounter	27 (41.5%)	28 (57.1%)	55 (48.3%)	0.1	20 (22.2%)	8 (18.6%)	28 (21.1%)	0.63
Reports 100% condom use, last 12 mo	20 (30.8%)	16 (32.7%)	36 (31.6%)	0.83	8 (8.9%)	4 (9.3%)	12 (9.0%)	0.94
Alcohol used at last sexual encounter	10 (16.9%)	11 (22.5%)	22 (19.3%)	0.46	7 (7.8%)	5 (11.6%)	12 (9.0%)	0.47
Believes partner has concurrent partners	16 (24.6%)	19 (38.8%)	35 (30.7%)	0.1	12 (13.3%)	6 (14.0%)	18 (13.5%)	0.92
Reports self has concurrent partners	19 (29.2%)	14 (28.6%)	33 (29.0%)	0.94	3 (3.3%)	4 (9.3%)	7 (5.3%)	0.15
>1 sexual partner in 12 months	31 (47.7%)	30 (61.2%)	61 (53.5%)	0.15	5 (5.6%)	4 (9.3%)	9 (6.8%)	0.42
High-risk sexual behavior, last 12 months	40 (61.5%)	40 (81.6%)	80 (70.2%)	0.02	22 (24.7%)	11 (25.6%)	33 (25.0%)	0.89
Ever had sex with a man (for men)	1 (1.6%)	4 (8.7%)	5 (4.6%)	0.08	n/a	n/a	n/a	n/a
What are your chances of getting HIV?								
None/Don't know	31 (47.7%)	14 (28.6%)	45 (39.5%)	0.05	50 (55.6%)	11 (25.6%)	61 (45.9%)	0.001
Low/Med/High	34 (53.1%)	35 (71.4%)	69 (60.5%)		40 (44.4%)	32 (74.4%)	72 (54.1%)	
Binge alcohol use, last 12 months	29 (44.6%)	33 (67.4%)	62 (55.4%)	0.02	12 (13.3%)	8 (18.6%)	20 (15.0%)	0.43
Any drug use, last 12 months	13 (20.0%)	20 (40.8%)	33 (29.0%)	0.015	3 (3.3%)	4 (9.3%)	7 (5.3%)	0.15
Previously tested for HIV	33 (50.8%)	27 (55.1%)	60 (52.6%)	0.65	61 (67.78%)	33 (76.7%)	94 (70.7%)	0.29

High-risk partner: reports partner was a commercial sex worker, anonymous partner, or casual acquaintance. *High-risk sexual behavior*: in last 12 months reports at least one of the following: >1 sexual partner, concurrency, sex with a commercial sex worker, sex with a casual partner, sex with anonymous partner, sex with IDU, paying for sex or exchanging sex for drugs or goods, or sex with a transgendered person

Table 3 Correlates of previous HIV testing among men (N = 114)

	Never HIV tested, n (%)	Previously tested for HIV, n (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Education				
≤8th grade	39 (72.2%)	34 (56.7%)	1.00	
9th grade or greater	15 (27.8%)	26 (43.3%)	1.99 (0.91, 4.36)	
Age				
≤20	6 (11.1%)	6 (10.0%)	1.00	
21–30	22 (40.7%)	22 (36.7%)	1.00 (0.28, 3.58)	
31–40	19 (35.2%)	19 (31.7%)	1.00 (0.27, 3.66)	
>40	7 (13.0%)	13 (21.7%)	1.86 (0.43, 7.98)	
Income				
Unemployed/≤$400	37 (68.5%)	49 (81.7%)	1.00	
>$400	17 (31.5%)	11 (18.3%)	0.49 (0.20, 1.17)	
Employment				
Employed	41 (75.9%)	37 (61.7%)	1.00	
Day laborer	7 (13.0%)	14 (23.3%)	2.22 (0.81, 6.09)	
Unemployed	6 (11.1%)	9 (15.0%)	1.66 (0.54, 5.12)	
Site of survey				
Street/clinic/fair/CBO	39 (72.2%)	53 (88.3%)	1.00	1.00
Bar	15 (7.8%)	7 (11.7%)	0.34 (0.13, 0.92)	0.30 (0.10, 0.90)
Place of birth				
US-born	2 (3.7%)	1 (1.7%)	1.00	
Foreign-born	52 (96.3%)	59 (98.3%)	2.27 (0.20, 25.8)	
Years in the US				
0–5 years	28 (51.9%)	26 (43.3%)	1.00	
>5 years	26 (48.1%)	34 (56.7%)	1.41 (0.67, 2.95)	
Can a person with HIV look healthy?				
No/don't know	28 (51.9%)	15 (25.0%)	1.00	1.00
Yes	26 (48.1%)	45 (75.0%)	3.23 (1.46, 7.13)	3.51 (1.49, 8.26)
HIV transmission knowledge				
Knows ≤2 correct modes	49 (90.7%)	40 (60.7%)	1.00	1.00
Knows 3–4 correct modes	5 (9.3%)	20 (33.3%)	4.9 (1.69, 14.22)	4.37 (1.45, 13.18)
What are your chances of getting HIV/AIDS?				
Don't know/none	28 (51.9%)	17 (28.3%)	1.00	
Low	19 (35.2%)	30 (50.0%)	2.60 (1.13, 5.98)	
Med/high	7 (12.9%)	13 (21.7%)	3.06 (1.02, 9.18)	
Any drug use, last 12 m				
None	35 (64.8%)	46 (76.7%)	1.00	
At least one	19 (35.2%)	14 (23.3%)	0.56 (0.25, 1.27)	

were typically young and single, which is common in migration as men are typically the first to move or to be sent by their families in search of economic opportunities [17, 30]. Women often migrate following their spouses or family, and thus are more likely to be married [17, 30, 31]. Due to these sociodemographic differences between men and women as well as cultural values, the risk behavior profile of immigrant Latinos can differ significantly by gender.

Compared to the 2008 study, women were now more likely to have been ever tested for HIV than men (71 vs. 53%, respectively, $P = 0.004$). The majority of Latina women accessing BCHD services was married and reported relatively low prevalence of sexual risk behaviors when compared to the Latino men. Despite the low prevalence of reported risk behaviors, this is exactly the population of Latina women that needs to be tested for HIV. Often times the only risk factor for the foreign-born Latina women is

Table 4 Correlates of previous HIV testing among women (n = 133)

	Never HIV tested, n(%)	Previously tested for HIV, n (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age				
≤20	4 (10.3%)	2 (2.1%)	1.00	
21–30	16 (41.0%)	34 (36.2%)	4.25 (0.70, 25.67)	
31–40	11 (28.2%)	37 (39.4%)	6.73 (1.08, 41.77)	
>40	8 (20.5%)	21 (22.3%)	5.25 (0.80, 34.50)	
Marital status				
Married/committed	19 (48.7%)	65 (69.2%)	1.00	1.00
Single	20 (51.3%)	29 (30.9%)	0.42 (0.20, 0.91)	0.47 (0.20, 1.12)
Do you live with relatives?				
No	7 (18.0%)	5 (5.3%)	1.00	1.00
Yes	32 (82.0%)	89 (94.7%)	3.89 (1.15, 13.14)	8.54 (1.74, 41.86)
Age moved to US				
≤10	5 (12.8%)	5 (5.3%)	1.00	1.00
11–20	9 (23.1%)	30 (31.9%)	3.33 (0.78, 14.16)	
21–30	19 (48.7%)	32 (34.0%)	1.68 (0.43, 6.58)	
>30	6 (15.4%)	27 (28.7%)	4.5 (0.98, 20.63)	
Can a person with HIV look healthy?				
No/don't know	23 (59.0%)	28 (29.8%)	1.00	1.00
Yes	16 (41.0%)	66 (70.2%)	3.39 (1.56, 7.36)	3.24 (1.38, 7.62)
HIV transmission knowledge				
No incorrect methods	30 (76.9%)	80 (85.1%)	1.00	1.00
Stated ≥1 incorrect	9 (23.1%)	14 (14.9%)	0.39 (0.16, 0.95)	0.36 (0.13, 0.97)
Condom used during last sexual encounter				
Yes	11 (28.2%)	17 (18.1%)	1.00	
No	28 (71.8%)	77 (81.9%)	1.78 (0.74, 4.26)	
Binge alcohol use, last 12 months				
No/don't know/refused	36 (92.3%)	77 (81.9%)	1.00	1.00
Yes	3 (7.7%)	17 (18.1%)	2.65 (0.73, 9.62)	4.98 (0.97, 25.43)

unprotected sex in a monogamous heterosexual relationship [32, 33]. This phenomenon, where a woman is at high-risk of HIV due to her spouse's behaviors, has been seen in other non-Western cultures [34]. It may also reflect women's difficulties negotiating condom use with their male partners, especially related to cultural expectations of gender roles. Thus, non-targeted, general population screening for Latina women is necessary to reach the at-risk Latina population. Our previous study showed that women were less likely to agree to HIV testing in street or other local non-medical settings [22], but more likely to agree to testing as a part of healthcare or in private locations at community based organizations. Therefore, the BCHD Latino Outreach Program had strengthened gender-sensitive serviced provided in community clinics and CBOs, and the majority (70%) of the women in this study accessed services in these locations. BCHD Latino Outreach Program was now successfully capturing the at-risk

population of Latina women for HIV testing and education services.

Among the men accessing BCHD services, the Latino Outreach Program is successfully targeting Latino men with HIV risk behaviors as 70% reported at least one high-risk sexual behavior in the last year. However, there are some subgroups that are still not accessing the HIV testing services such as bar patrons and MSMs. Nationally, MSM is the highest transmission risk category, accounting for 72% of the new HIV infections among Latino men [5]. In our sample, only 3.5% of Latino men admitted to having sex with men. Although the prevalence of Latino MSM in the entire Baltimore community was not determined in this study, it is likely that the 3.5% accessing the BCHD Latino Outreach Program is a relatively low number. Another likely underserved population is bar patrons, as the men surveyed at bars were less likely to have been previously tested. The Latino Outreach Team has been building

relationships with the owners of certain Latino-frequented bars, who often are very supportive of HIV education and testing programs. Through these efforts, we hope to improve HIV testing and education rates in this vulnerable population. However, other strategies, such as referral networks or social marketing, may be needed to serve hard-to-reach MSM and other at-risk hidden populations.

Interestingly, we found that HIV testing behavior was more correlated with HIV knowledge than any migration or acculturation factors, self-perception of HIV risk, or actual risk behaviors. In fact, the lack of correlation between perception of risk and actual HIV risk (Table 2) or previous test (Tables 3, 4) for HIV highlights the importance of providing routine opt-out HIV testing, as recommended by the CDC [3], rather than depending self-assessment or physician-assessment of risk as an effective HIV screening strategy.

Knowledge of specific HIV/AIDS facts was independently associated with having an HIV test among both Latino men and women. Previous studies have shown that low levels of HIV knowledge have been associated with both low HIV testing rates [35] and new diagnoses of HIV infection in Latino populations [36]. Among Latinos, foreign-birth, country of origin, and shorter duration of residence in the United States impacts HIV/AIDS-related knowledge [13]. Additionally, Latinos often only seek preventative health services, such as cancer screening, when they feel sick [37]. We found that knowing that an HIV-infected person can look, feel, and act healthy was associated with increased likelihood of having tested for HIV in the past. Preventative health behaviors among Latinos are often influenced by the concept of fatalism or "fatalismo", the belief that events occur as a result of fate or powers beyond a person's control and cannot be altered by a person's behavior [38, 39]. In light of this cultural perception, several studies have found that Latinos are often hesitant to participate in preventative healthcare behaviors such as cancer screenings because of a belief that a cancer diagnosis is immutable and equates with death [37–39] Knowing that an HIV diagnosis does not necessarily equate with poor health and death may be a key piece of knowledge to encourage routine HIV testing and prevent late diagnosis among Latinos. Knowledge of HIV transmission methods was also associated with HIV testing. Therefore, simple messages focusing on transmission methods and the "look" of HIV may improve testing rates among Latinos.

There are several limitations to this study. This was an evaluation of individuals accessing the BCHD Latino Outreach services and information on those who refused or were not offered the survey is not known. Therefore, we can only make the assumption that we are reaching an at-risk population based upon comparison between the behavioral profile of the Latinos accessing BCHD services and known at-risk Latino populations from previous research studies. Also we were unable to evaluate current HIV testing behaviors or results of a current HIV test because phlebotomy services were not available at all BCHD Latino Outreach events. These results are not generalizable to the entire Latino population in the US, but may be relevant to outreach programs serving similar populations and experiencing rapid growth in Latino foreign-born populations from Central America and Mexico. In addition, the brief ARSMA-II scale was developed and validated in a population of Mexican immigrants to the US, therefore its application in this population may have been limited as the majority of participants were of Central American descent. Important variables such as risk behavior and history of HIV test were self-reported and subject to misclassification. Self-report of HIV testing among Latinos often overestimates HIV testing rates as Latinos often believe testing is done routinely during a doctor's visit [32]. However, our sample was predominantly uninsured and with poor access to medical services so overestimation of HIV testing is unlikely. The desire for social acceptability may also explain the low report of MSM behavior since homosexuality is often stigmatized in the Latino culture.

Conclusion

The explosive Latino population growth in the southern and Midwestern US has also reached Baltimore city and, as the population has increased, so has the impact of HIV/AIDS on this community. As a result, the BCHD Latino Outreach program is evolving to understand and better serve the needs of the community. Although HIV testing prevalence improved among the Latinos accessing BCHD services over the past few years, HIV misconceptions are still common and highly correlated with testing rates among Latinos. Targeting HIV educations efforts to include awareness of HIV transmission modes and that HIV-infected individuals may look and feel healthy may increase HIV screening rates in other foreign-born, recently immigrated Latino populations similar to those in the Baltimore area.

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