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Increasing HIV Testing Among Latinos by Bundling HIV Testing with Other Tests

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ABSTRACT *Latinos in the United States are disproportionately impacted by HIV/AIDS. They accounted for 20.4% of the AIDS cases reported in 2003, despite the fact that they represent 13.3% of the civilian non-institutional population of the United States. Thus it is important to identify ways to increase HIV testing among Latinos engaging in high risk behaviors. One approach that has been proposed for increasing HIV testing is the "bundling" of HIV prevention interventions with other relevant services. This study examined whether offering HIV testing with screening for other conditions would increase HIV testing among Latino men who frequent gay bars. A cross-sectional survey of 394 Latino men was conducted at both urban and suburban gay bars. Overall, no statistical differences were found in the number of individuals who took the HIV test or who tested HIV-positive when the HIV test was offered with screening for other conditions (alcohol problems, drug dependence, depression, syphilis, gonorrhea and chlamydia) compared to when it was offered by itself. However, multivariate analysis found that three groups of Latino men were more likely to test for HIV when it was bundled with other tests: those who reported having sex primarily with women, those with other risk factors that could also be tested through a bundled test approach, and those who were clients of the suburban gay bar that was farthest from a large geographical gay community. Further studies of bundled HIV testing should be conducted with other key subpopulations that may be more willing to take an HIV test when it is offered with other relevant tests than when offered by itself.*

KEYWORDS *Bundling, HIV, Latinos, Prevention, Sexually transmitted diseases.*

INTRODUCTION

Latinos in the United States are disproportionately impacted by HIV/AIDS. From the beginning of the epidemic through 2003, Latinos have accounted for 18.6% of all AIDS cases and 20.4% of the cases reported in 2003,[1] although they represent 13.3% of the civilian non-institutional population of the U.S.[2] Latinos have also been found to be less likely to have their HIV seropositive status detected early in its infection (greater than 5 years between the first reported HIV-positive test and an AIDS diagnosis) when compared to non-Latino Whites.[3,4] Failure to get tested early

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for HIV results in a delay in accessing treatment for those infected and increases the possibility of others being infected.

One approach that has been proposed for increasing HIV testing is the "bundling" of HIV testing with other services.[5] "Bundling" is a concept taken from business and refers to grouping products and offering them as a package.[6] The most common example of bundling is "mixed bundling."[7] This occurs when both the bundle and the individual products are offered to consumers. From a business perspective, this can result in increased sales, improved coordination of business activities, and reduced infrastructure costs.[7] From a consumer perspective, this can result in receiving integrated value-added services, having "one-stop" shopping, and paying lower prices.[5]

Bundling HIV testing with other services can result in some of these same benefits. In addition, bundling HIV testing can also potentially help to overcome barriers that prevent individuals from being tested for HIV. For example, individuals reporting high risk behaviors who have not tested for HIV have been found to have a greater level of HIV risk denial, greater fear of HIV and less knowledge of HIV risk factors than their counterparts who have tested for HIV.[8]

Bundling HIV prevention services has already been occurring on a limited scale. For example, the CDC supports using HIV testing services to identify individuals at risk for hepatitis C virus.[9] In addition, prior research has demonstrated the positive public health benefits of screening for other sexually transmitted diseases (STDs) in HIV programs.[10]

This study hypothesized that bundling HIV testing with screening for other conditions would increase HIV testing among Latino men who frequent gay bars and also result in more HIV-positive people being identified. If correct, this information could lead to increased HIV testing among Latinos engaging in high risk behaviors. This could promote early entry into HIV care for those who are HIV-positive, which in turn is associated with a better prognosis and survival.[11] This could also lower the risk of HIV transmission to others, as a high proportion of HIV-positive people adopt safer sexual behaviors after learning of their diagnosis.[12,13]

The study was approved by the Institutional Review Board of Charles R. Drew University of Medicine and Science.

METHODS

Participants and Recruitment Sites

A total of 394 Latino men who frequent bars catering to men who have sex with men was recruited. Participants had to be over the age of 21 and have the capacity to provide informed consent. They could be interviewed in either Spanish or English. Three bars in Los Angeles County known to be popular among Latino men who have sex with men were selected as recruitment sites. Two of these were urban bars in the city of Los Angeles located two and four miles, respectively, from a large geographical gay-identified community; the other bar was located in a suburb of Los Angeles approximately 16 miles from that same gay community.

Procedure

HIV testing outreach was conducted at selected bars. On one night, selected individuals were offered only the HIV test. On a different night, individuals were

offered a number of tests (described below), including the HIV test (the bundled protocol). The protocols were offered on alternate weeks on matched nights (e.g., on alternate Saturday evenings). However, the exact alternate week matching was not always possible because of scheduling difficulties.

Participants were randomly chosen as they arrived at the bar. Interviewers chose every third person arriving to the bar; on slower nights, they chose every second person. If the person expressed an interest in participating, he was administered a screener to determine ethnicity, age and risk behaviors. HIV risk behaviors were assessed with two sets of questions. The first set asked whether the individual was currently homeless or in temporary housing; had had sex while high or intoxicated in the previous month; had had an STD in the previous 12 months; had exchanged sex for food, money, drugs, or shelter in the previous three months; or had used crack, cocaine or methamphetamines in the previous three months. The second set asked whether he had had unprotected sex (oral, vaginal or anal) with someone whose HIV status was unknown in the previous 12 months, had had unprotected sex (oral, vaginal or anal) with someone who was HIV-positive in the previous 12 months, had shared injection apparatus (e.g., needles/works) with someone whose HIV status was unknown in the previous 12 months, or had shared injection apparatus (e.g., needles/works) with someone who was HIV-positive in the previous 12 months. Each individual was asked to answer each group of questions as a set, i.e., instead of answering each question separately, he would wait until all the questions for that set were asked and then respond whether one or more of the questions applied to him. The questions were asked in this manner because the individuals had not yet provided written informed consent for the study. Thus by answering questions as sets, a determination of an individual's eligibility for the study could be made without obtaining information on which specific risk factor was the determining factor.

All individuals who were approached were documented on a log sheet as having "consented to participate," having "refused," or being "ineligible." Individuals were considered research participants in the HIV-only protocol if they agreed to take the HIV test. Those in the bundled tests protocol were considered research participants if they agreed to take at least one of the tests offered to them, whether or not they selected the HIV test. Participants received $15 at the end of their test(s).

Measures

To determine which tests to include in the bundled protocol, we identified the most prevalent health-related conditions affecting the morbidity and mortality of Latino males in Los Angeles County, the location where this study was carried out. These are ranked in descending order as follows: (1) alcohol dependence, (2) homicide/violence, (3) depression, (4) diabetes mellitus, (5) osteoarthritis, (6) motor vehicle crashes, (7) coronary heart disease, (8) drug overdose/other intoxication, (9) stroke, and (10) cirrhosis.[14] From this list, alcohol problems, depression and drug dependence were selected as conditions to be screened in the bundled protocol.

The measures used were as follows:

A. The OraQuick® Rapid HIV-1 Antibody Test was used to test for HIV. This was administered as a fingerstick and produced results in about 20 min.
B. Alcohol problems were assessed using the Rapid Alcohol Problems Screen 4 (RAPS4).[15,16] A positive response to any one of the four items on the screener is considered to be a positive test for alcohol problems.

C. Drug dependence was assessed using the Texas Christian University Drug Screen II (TCUDS II).[17] Values of three or greater indicate relatively severe drug-related problems and correspond approximately to a drug dependence diagnosis.
D. Depression was assessed using the Center for Epidemiologic Studies—Depression Scale (CES-D).[18] A cutoff score of 16 was used as a classification of depression. [19]
E. Tests were also offered for syphilis, gonorrhea and chlamydia.

All test results were given immediately to the participants with the exception of the tests for syphilis, gonorrhea and chlamydia. Individuals taking those tests made arrangements to obtain their results at a later time. Participants testing positive for any of the tests or screeners were provided with appropriate referrals for follow-up mental health or substance abuse counseling and medical care as necessary.

Participants also completed a brief interview on their demographics, sexual orientation and sexual practices. Demographic questions included year and country of birth, years lived in the U.S., years of education, previous year's gross income, residency status in the U.S., and sexual orientation. Questions on sexual behaviors in the previous 12 months consisted of the number of sexual partners, the gender of the sexual partners, any unprotected penetrative anal sex, and any unprotected receptive anal sex.

As a measure of risk factors for HIV, the first set of five high risk questions mentioned above was utilized. This assessed for the following risk factors: being currently homeless or in temporary housing; having had sex while high or intoxicated in the previous month; having had an STD in the previous 12 months; having exchanged sex for food, money, drugs or shelter in the previous three months; and having used crack, cocaine or methamphetamines in the previous three months. Subsequently, a dichotomous variable was created with a positive response to any of these risk factors indicating having a risk factor for HIV.

Data Analysis

The x^2 test was used to test for differences between the bundled tests protocol and the HIV-only test protocol regarding whether individuals agreed to take the HIV test. The Fisher's exact test was used to test for differences between the two protocols regarding whether individuals were identified as HIV-positive. Bivariate and multivariate logistic regressions were used to determine the association of different independent variables with the likelihood of choosing the bundled tests protocol versus the HIV-only protocol. All tests were conducted using Stata 6.0.[20]

RESULTS

Sample Characteristics

A total of 3,645 Latino men were approached during the study. Of these, 11% agreed to participate and were eligible, 1% was ineligible, and 88% declined. The sample characteristics are presented in Table 1.

TABLE 1. Sample characteristics

Variable	*N*	Percent
Total	394	100.0
Site		
Bar A (suburban)	151	38.3
Bar B (urban)	175	44.4
Bar C (urban)	68	17.3
Language of interview		
English	209	53.1
Spanish	185	46.9
Age		
21–25	114	28.9
26–30	146	37.1
31–35	65	16.5
36–40	46	11.7
41–45	17	4.3
46–50	6	1.5
Country of birth		
U.S.A.	148	37.6
Mexico	176	44.7
Other Latin American Country[a]	70	17.8
Years lived in the U.S.		
0–10	132	33.5
11–20	84	21.3
21–30	141	35.8
31–40	30	7.6
41–49	7	1.8
Years of education		
0–6	20	5.1
7–12	172	43.7
13–16	159	40.4
17–23	43	10.9
Previous year's gross income		
No response or missing	5	1.3
No income	27	6.9
Less than $5,000	22	5.6
$5,000–10,000	38	9.6
$10,001–25,000	134	34.0
$25,001–50,000	136	34.5
$50,001–75,000	20	5.1
$75,001–100,000	9	2.3
Over $100,000	3	0.76
Residency status in U.S.		
U.S. citizen	186	47.2
Legal resident	88	22.3
Undocumented worker	74	18.8
Other	46	11.7
Sexual orientation		
Heterosexual[b]	9	2.3
Bisexual	111	28.2
Gay[c]	274	69.5

TABLE 1. ***Continued***

Variable	*N*	Percent
Number of sexual partners in previous year		
None	4	1.0
1–5	238	60.4
6–10	77	19.6
11–20	37	9.4
21–60	32	8.1
100–300	5	1.3
365	1	0.3
Gender of sexual partners in previous year		
Primarily men	315	80.8
Primarily women	19	4.9
Equally men and women	56	14.4
Unprotected penetrative anal sex in previous 12 months		
Yes	234	60.2
No	155	39.8
Unprotected receptive anal sex in previous 12 months		
Yes	148	38.1
No	241	61.9
Risk factors[d]		
Yes	224	56.9
No	170	43.2

Some cells do not add up to 100% because of rounding.

[a] El Salvador, 20; Guatemala, 18; Honduras, 10; Nicaragua, 3; Other Central American countries, 7; Cuba, 6; South American countries, 6.

[b] Includes one other man who reported having sex primarily with women in the previous 12 months.

[c] Includes two other men who reported having sex primarily with men in the previous 12 months.

[d] Any of the following: being currently homeless or in temporary housing; having had sex while high or intoxicated in the previous month; having had a sexually transmitted disease (STD) in the previous 12 months; having exchanged sex for food, money, drugs or shelter in the previous 3 months; or having used crack, cocaine or methamphetamines in the previous 3 months.

Association Between Test Protocol and Taking the HIV Test

Of the 197 Latino men participating in the bundled tests protocol, 146 (74%) chose to take the HIV test (Table 2). The bundled tests protocol had a rate of 10.2% of individuals' agreeing to test for HIV, in contrast to a rate of 8.9% for the HIV-only protocol (non-significant; Pearson $x^2 = 0.173$).

Association Between Test Protocol and Testing HIV-Positive

Analyses were conducted to determine the association between the test protocol and testing HIV-positive. Table 3 shows the results for only those participants in each protocol who actually took an HIV test. This resulted in HIV positivity rates of 3.4% of the 146 individuals tested for HIV with the bundled tests protocol and 5.1% of the 197 individuals tested for HIV with the HIV-only protocol (non-significant; Fisher's exact test = 0.596). Additional analysis revealed that of the 15

TABLE 2. Association between testing protocol and taking the HIV test among all participants approached

Protocol	Took HIV test: No *n*	No Percent (%)	Yes *n*	Yes Percent (%)	Total number of participants approached
Bundled tests	1,281	89.8	146	10.2	1,427
HIV-only	2,021	91.1	197	8.9	2,218
Total number of participants approached	3,302	90.6	343	9.4	3,645

Pearson $x^2 = 0.173$.

HIV-positive cases, ten were obtained at suburban Bar A, five at urban Bar B and none at urban Bar C.

Logistic Regression Results of Choosing the Bundled Tests Protocol

Table 4 shows the results of bivariate and multivariate analyses using only those men who took an HIV test. In multivariate logistic regression analysis, Latino men who frequented gay bars but who reported primarily having had women as sexual partners in the previous year were significantly more likely to choose the bundled protocol compared to men who reported primarily having had men as sexual partners. Individuals who reported having had a risk factor were also significantly more likely to choose the bundled protocol. In contrast, those who were clients of urban Bar C were significantly less likely to choose the bundled protocol compared to clients of suburban Bar A.

DISCUSSION

This study had hypothesized that bundling HIV testing with tests for other conditions would result in a higher frequency of individuals receiving HIV testing as compared to offering HIV testing alone. However, there was no statistical difference between the two protocols with regards to the number of individuals who took the HIV test. In addition, there was no statistical difference between the two protocols regarding the number of individuals who tested HIV-positive.

TABLE 3. Association between testing protocol and testing HIV-positive among those who tested for HIV

Protocol	HIV-positive: No *n*	No Percent (%)	Yes *n*	Yes Percent (%)	Total number of participants who tested for HIV
Bundled tests	141	96.6	5	3.4	146
HIV-only	187	94.9	10	5.1	197
Total number of participants who tested for HIV	328	95.6	15	4.4	343

Fisher's exact test = 0.596.

TABLE 4. Likelihood of choosing the bundled tests protocol versus the HIV-only protocol among men who took an HIV test (Logistic Regressions)

	Bivariate[a]		Multivariate[b]	
Variable	OR	95% CI	AOR	95% CI
Site[c]				
Bar A (suburban)(Reference)	1.00	–	1.00	–
Bar B (urban)	0.74	0.47–1.18	0.63[§]	0.36–1.09
Bar C (urban)	0.37**	0.19–0.74	0.32**	0.15–0.69
Language of interview[c]				
English (Reference)	1.00	–	1.00	–
Spanish	1.01	0.66–1.55	1.17	0.58–2.37
Age[c]	1.02	0.98–1.05	1.02	0.97–1.07
Country of birth[c]				
U.S.A. (Reference)	1.00	–	1.00	–
Mexico	0.96	0.59–1.56	0.76	0.29–2.01
Other Latin American Country	1.31	0.72–2.41	1.18	0.43–3.19
Years lived in the U.S.[c]	1.00	0.98–1.02	1.01	0.97–1.06
Years of education[c]	0.97	0.91–1.03	0.97	0.89–1.05
Previous year's gross income[d]	1.00	0.94–1.05	1.01	0.95–1.08
Residency status in U.S.[c]				
U.S. citizen (Reference)	1.00	–	1.00	–
Legal resident	1.44	0.83–2.50	1.92	0.75–4.91
Undocumented worker	1.28	0.72–2.26	1.81	0.61–5.40
Other	0.87	0.43–1.74	1.34	0.42–4.28
Sexual orientation[c]				
Bisexual/other (Reference)[†]	1.00	–	1.00	–
Gay[‡]	0.85	0.54–1.34	1.59	0.82–3.10
Number of sexual partners in previous year[c]	1.00	1.00–1.01	1.00	0.99–1.01
Gender of sexual partners in previous year[e]				
Primarily men (Reference)	1.00	–	1.00	–
Primarily women	5.46**	1.75–17.0	6.96**	1.85–26.2
Equally men and women	1.50	0.81–2.76	1.94	0.88–4.32
Unprotected penetrative anal sex in previous 12 months[f]				
No	1.00	–	1.00	–
Yes	0.91	0.58–1.42	1.11	0.64–1.93
Unprotected receptive anal sex in previous 12 months[f]				
No	1.00	–	1.00	–
Yes	0.65[§]	0.41–1.01	0.65	0.38–1.14
Risk factors[#c]				
No	1.00	–	1.00	–
Yes	1.44	0.93–2.22	1.65*	1.02–2.65

[a]Sample sizes vary by variable because of missing values. [b]$n = 336$, [c]$n = 343$, [d]$n = 339$, [e]$n = 341$, [f]$n = 340$.

[†]Includes eight men who identified as heterosexual and one other man who reported having sex primarily with women in the previous 12 months.

[‡]Includes two other men who reported having sex primarily with men in the previous 12 months.

[#]One or more of the following: being currently homeless or in temporary housing; having had sex while high or intoxicated in the previous month; having had an STD in the previous 12 months; having exchanged sex for food, money, drugs or shelter in the previous 3 months; or having used crack, cocaine or methamphetamines in the previous 3 months.

*$p < 0.05$; **$p < 0.01$; [§]$p < 0.10$.

However, Latino men who reported having had sex primarily with women were significantly more likely to choose the bundled protocol than Latino men who had sex primarily with men. One interpretation of this outcome could be that men who go to gay bars but who are primarily sexually active with women may not perceive themselves as being at risk for HIV. From a public health perspective, this is particularly troubling because men who screened to be at low risk were not included in the study. Another explanation may be that men whose primary partners are women may have more fear or perceive more stigma in taking an HIV test and hence found the bundled tests protocol more appealing.

Individuals who reported having one or more risk factors were significantly more likely to choose the bundled protocol when taking an HIV test. This may have been in part because the risk factors included having had an STD in the previous 12 months and having used crack, cocaine or methamphetamines in the previous 3 months. Since the bundled tests protocol tested for other STDs besides HIV as well as drug dependence, individuals with either condition might have been more inclined to participate in the bundled tests protocol rather than one focusing exclusively on HIV.

Clients of urban Bar C were significantly less likely to choose the bundled protocol when taking an HIV test in comparison to the patrons of suburban Bar A. As noted previously, Bar A is located in a non-gay identified area. In contrast, Bar C is in close proximity to an area with a large number of openly gay individuals and many gay-identified businesses. Gay communities are more likely to have billboards and other reminders focusing specifically on the need to get HIV testing in comparison to non-gay areas. It is possible that the reason the clients of Bar C were less likely to choose the bundled protocol in comparison to those of Bar A may have been at least in part due to Bar C's close proximity to a gay-identified geographical area.

Of interest is the fact that of the 15 HIV-positive individuals identified in the study, ten of them were from suburban Bar A, and none were from urban Bar C. Given that most of the HIV-positive individuals were from the suburban bar and none from the bar in closest proximity to the gay-identified area, this suggests a need for increased HIV testing at gay-identified venues in suburban areas with lower numbers of openly gay individuals and establishments. Urban Bar B is located between the other two bars and had five of the identified HIV-positive individuals.

This study suggests that bundling HIV testing with other relevant tests could encourage HIV testing among high-risk Latino men who go to gay bars but have sex primarily with women. Future studies might also consider which combinations of tests could be more effective in increasing rates of HIV testing among different Latino subpopulations.

This study had some limitations. Although the participants were randomly chosen as they entered the bars, many refused to participate, and thus the sample is subject to self-selection bias. Also, the low participation rate may reflect the challenges involved in offering HIV testing and tests for other conditions in the settings and times utilized by this study. Further, the bars were not randomly selected, and thus the results are not able to be generalized to Latino men who frequent gay bars in the Los Angeles area.

We were also not able to conduct comparisons between those who participated in the study and those who did not. Since those who declined to participate did not provide informed consent, we were not able to inquire further about their demographics or reasons for declining.

Another study limitation regards measures. Recruitment occurred at locations (bars) and times (late evenings) when the bar clients were not expecting to participate

in a research study, and so we limited the length of the survey. Some questions were condensed in a manner that resulted in the loss of other potentially important information. Nevertheless, by keeping the interview short, we are convinced that more individuals agreed to participate and successfully completed the entire survey than what may have been the case had we used a longer survey.

Despite these limitations, this study identified the potential benefit of offering the HIV test in a "bundled package" to different subpopulations of Latino men. Further research can help to identify other potential benefits and challenges of bundling the HIV test for use with other populations.

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