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## HIV testing among MSM in Bogotá, Colombia: The role of structural and individual characteristics

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### Abstract

This study used mixed methods to examine characteristics related to HIV testing among men who have sex with men (MSM) in Bogotá, Colombia. A sample of 890 MSM responded to a computerized quantitative survey. Follow-up qualitative data included 20 in-depth interviews with MSM and 12 key informant interviews. Hierarchical logistic set regression indicated that sequential sets of variables reflecting demographic characteristics, insurance coverage, risk appraisal, and social context each added to the explanation of HIV testing. Follow-up logistic regression showed that individuals who were older, had higher income, paid for their own insurance, had had a sexually transmitted infection, knew more people living with HIV, and had greater social support were more likely to have been tested for HIV at least once. Qualitative findings provided details of personal and structural barriers to testing, as well as interrelationships among these factors. Recommendations to increase HIV testing among Colombian MSM are offered.

### Keywords

HIV testing; MSM; insurance; HIV risk; social support

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Men who have sex with men (MSM) constitute a group at high risk for HIV, including in low- and middle-income countries (Adam et al., 2009; Baral, Sifakis, Cleghorn, & Beyrer, 2007) such as Colombia (Fondo de Población de las Naciones Unidas (UNFPA) and Ministerio de Salud y Protección Social, 2011). Recent samples of MSM recruited with respondent-driven sampling in seven cities in Colombia provided estimates of HIV prevalence ranging from 6% to 24%, with 15% prevalence in Bogotá (Rubio Mendoza & Luque, 2012). Earlier venue-based research had estimated prevalence at 20% of MSM in Bogotá (Montano et al., 2005).

In low- and middle-income countries, as many as 90% of HIV-infected individuals are thought to be unaware of their status (UNHCR/WHO/UNAIDS, 2009). A national survey in Colombia estimated that for every nine HIV-positive people, as few as one might be aware of his or her infection (Arrivillaga et al., 2012). Among MSM in seven Colombian cities, 14% to 31% reported ever having been tested (UNFPA and Ministerio de Salud y Protección Social, 2011). In the U.S., HIV testing every three to six months is recommended for individuals from high-risk groups (Oster et al., 2011). This study examined HIV testing among MSM in Bogotá.

Conditions facilitating or inhibiting HIV-testing behavior vary in different cultures and settings (Mounier-Jack, Nielsen, & Coker, 2008) and include both personal and contextual characteristics (Mimiaga et al., 2009; Schwarcz et al., 2011). Research has identified a variety of health-care related barriers to testing, including limited access, lack of knowledge of rights and services, actual or expected costs, and perceived clinic-based impediments (Beattie et al., 2012; Deblonde et al., 2010; Flowers, Knussen, Li, & McDaid, 2013; Huang et al., 2012; Mills et al., 2011; Mimiaga et al., 2009; Prestage, Brown, & Keen, 2012; Schwarcz et al., 2011). Demographic circumstances, such as education and income, have also often been linked to HIV testing (Holt et al., 2011; Li et al., 2012; Mimiaga et al., 2009), including in Colombia (Galindo et al., 2011). In addition, an individual's perception of HIV risk has been associated with testing behavior (Deblonde et al., 2010; Dowson, Kober, Perry, Fisher, & Richardson, 2012; Huang et al., 2012; Mills et al., 2011; Prestage et al., 2012;), as have HIV or gay stigma, concerns about disclosure, and fears of HIV and of others' reactions (Beattie et al., 2012; Deblonde et al., 2010; Dowson, et al., 2012; Flowers et al., 2013; Li et al., 2012; Lorenc et al., 2011).

Health care in Colombia was privatized in 1993 in a managed care system providing different coverage depending on ability to pay (Yepes, Ramírez, Sánchez, Ramírez, & Jaramillo, 2010). As Abadía and Oviedo (2009) explained, individuals with the financial means are required to pay a portion of their incomes for private health insurance under the contributory plan. People unable to pay because they are not employed or in the formal economy can be covered under a subsidized plan; the government pays private insurers to provide plans for people who qualify for these subsidized benefits. People can choose their insurance company (Empresa Promotora de Salud or EPS) among options available within their type of plan, and those with the contributory plan can also choose their level of coverage (basic, intermediate, complex). There have been large discrepancies in the scope of care under the contributory and subsidized plans; however, in 2012 the government mandated changes with the aim of achieving equivalent coverage for the subsidized and basic contributory plan by 2015 (Comisión de Regulación en Salud, 2012). People unable to pay or to qualify for subsidized insurance are covered by the linked plan (*vinculados*) and can be treated in public hospitals when necessary, but do not receive ongoing or preventive care. Under all the plans, co-payments are required.

Although this system has brought about a large increase in the proportion of the population covered by insurance, people are frequently denied care for administrative, economic, or bureaucratic reasons (Abadía & Oviedo, 2009). Relative to HIV, despite improvements, better HIV care and services are available for those covered by contributory plans than by

subsidized plans (Moreno et al., 2012). Government policy affirms the right to free semi-annual HIV testing (Ministro de la Protección Social de la República de Colombia, 2006); however, a national study found that Colombians with no education and no affiliation with the health system were less likely to have been tested (Arrivillaga et al., 2012).

The current study used mixed methods to examine factors related to HIV testing behavior among Colombian MSM in Bogotá. In the quantitative analysis, we investigated how four sets of variables—1) demographic characteristics, 2) health insurance coverage, 3) risk appraisal, and 4) social context—were related to testing. We hypothesized that each successive set would contribute additional explanatory power in a model with a dichotomous outcome variable of ever having an HIV test. Moreover, we hypothesized that higher socioeconomic status (older age, higher income, and more education) would be associated with having tested for HIV. In addition, we hypothesized that type of insurance would provide further explanation of testing behavior beyond the demographic factors. We also hypothesized that the inclusion of the set reflecting HIV risk appraisal (having had an STI and knowing people living with HIV) would add to the explanation of testing behavior beyond that achieved by the demographic and health-care sets. Based on the literature, we anticipated that greater appraised risk would be associated with testing. Finally, we expected that the set reflecting the social context (social support, experience of discrimination) would provide additional explanation, such that a more supportive social context would be associated with greater likelihood of testing. Qualitative analyses further explored structural and individual barriers to HIV testing.

## Methods

The data for this paper were collected as part of a five-year study of HIV prevalence, sexual risk, and attitudes toward circumcision among Colombian MSM. After finding low rates of HIV testing, we expanded data collection to include qualitative interviews with key informants and MSM, so that we could gain a fuller understanding of issues affecting HIV testing behavior.

### Quantitative data collection

**Participants and procedures**—The total sample for the quantitative survey was 1000 MSM and transgender women. Inclusion criteria were to be currently living in Bogotá, to have had sex with a man within the previous six months, to have been born a biological male, and to be between 18 and 49 years of age. Preliminary analyses indicated that the transgender women differed from the MSM in several important ways, but their small number resulted in sparse representation in cells and thus precluded effective use of gender identity as a control variable. Therefore, we excluded 58 participants who identified as transgender for this paper. In addition, we excluded 52 participants who reported being HIV-positive on the survey, because motivations for and timing of HIV testing would be influenced by different factors from those relevant for HIV-negative individuals. The final sample for the quantitative analysis was 890.

The sample for the quantitative survey was recruited via respondent-driven sampling with four MSM serving as the initial seeds. These individuals were suggested by our colleagues

within the gay community and were chosen to represent diverse socioeconomic backgrounds. Participants could refer a maximum of three people to the study, and they received 70,000 Colombian pesos (approximately US\$40) for their own participation and 30,000 Colombian pesos (approximately US\$17) for each participant whom they recruited. We used computer assisted self-interview technology with audio enhancement (A-CASI) and touch-screen responding to administer the survey in Spanish. Collection of survey data took place in 2011.

**Quantitative Measures**—Survey questions were developed in Spanish by native-Spanish speakers for this or previous studies by our research team, with the exception of the Homonegativity Scale, which was adapted from an existing measure (Díaz, Ayala, Bein, Henne, & Marin, 2001). English translations for publication purposes were prepared, reviewed, and revised by bilingual research team members. The quantitative survey assessed a variety of topics; for this paper, we focused on questions concerning HIV testing, demographic background, insurance coverage, history of STIs, knowing people with HIV, social support, and experiences of homonegativity.

Responses to the question, “Have you ever had an HIV test?” included *no* (0), *yes* (1), and *I don’t know; I am not sure*. For the analysis, we recoded responses indicating that the participant did not know as no (0). Individuals who indicated that they had been tested were asked a follow-up question concerning the year of their last test. For the descriptive analysis, we classified participants as recent testers (who reported having been tested within the current or previous calendar year), past testers (who reported having been tested at some earlier time), and non-testers (who had never been tested).

Demographic information included age, education, and income. To determine insurance coverage, we asked “What type of health plan do you have?” Response options included *contributory*, *subsidized*, *linked*, *I don’t know*, and *I don’t have any*. Dummy variables were created for each type of insurance coverage with 1 indicating that the participant reported having this type and 0 indicating that he did not.

Participants indicated if they had ever had any of the following: gonorrhea, syphilis, chlamydia, genital herpes, hepatitis B or C, genital warts, and genital lice. If so, we coded the participant as having had a sexually transmitted infection (STI). We also asked, “How many people do you know who are living with HIV?” Response options ranged from 0=*None* to 3=*More than five people*.

Social support was assessed with six questions addressing emotional and instrumental support from gay friends, straight friends, and family members. The mean was used as the scale score. A sample question was: “When you are upset or feel bad, how frequently do you receive support (understanding, advice, etc.) from your gay friends?” Response options ranged from 0=*Never* to 4=*Always*. Cronbach’s alpha in this sample of 890 MSM was .83.

Homonegativity was measured with a four-item scale (adapted from Díaz et al., 2001), which assessed the frequency of experiencing homonegativity in the form of attacks, negative comments, discrimination, and beatings. A sample question was: “As an adult, how

frequently have you been attacked for your sexual orientation or for being a man who has sex with men?" Response options ranged from 0=*Never* to 3=*Many times*. Cronbach's alpha in the subsample for this paper was .65.

**Quantitative data analysis**—The hypotheses were tested using hierarchical logistic set regression. This approach is an extension of traditional logistic regression, but with sets of conceptually and statistically related variables (rather than single independent variables as predictors) entered in sequential steps. Significance tests, calculated as the difference in the -2 log likelihood of the successive models, assess the impact of each additional set entered beyond the previously entered sets (Hosmer & Lemeshow, 1989).

The first step tested a model containing the set of demographic variables (age, income, education). In the second step, the set of dummy variables describing insurance coverage was added. The third step included the risk appraisal set, with variables reflecting having had a previous STI and knowing people living with HIV. In the last step, the social context set, with variables measuring social support and experiences of homonegativity, was entered.

### Qualitative data collection

Qualitative data on issues and experiences related to HIV testing were obtained from 12 key informants and 20 MSM. Key informants included individuals working in community-based organizations serving the LGBT community, government officials, and representatives from international organizations focusing on HIV. For the in-depth interviews, we used targeted recruitment in order to obtain a sample that included a majority of MSM who had never been tested for HIV.

Based on preliminary examination of quantitative findings, interview guides were created. Topics covered in the guide for key informant interviews focused on barriers to HIV testing for MSM, including those related to communication, structural conditions, and service provision. Guides for in-depth interviews with MSM covered the participant's medical access; attitudes about medical care; knowledge of, attitudes toward, and experiences of HIV testing; perceptions of and communication with health care workers who provide HIV tests; perception of own risk of HIV; discussion of HIV testing with partners; and emotional factors related to HIV and HIV testing. The key informant interviews and in-depth interviews with MSM were conducted by one of two Colombian research team members. Key informant interviews lasted from one-half to one hour, and key informants were not paid for their participation. In-depth interviews with MSM lasted about one hour; participants were reimbursed 70,000 Colombian pesos (approximately \$40). Qualitative data collection for this paper took place in 2012.

Interviews were audio-recorded. After transcription, data were coded using NVivo 8 software and a constructivist and iterative process. Five bilingual, native-Spanish speakers were involved in coding—two in Colombia and three in the U.S. Initially, the process of coding was done in groups of two, so that all text was coded by two team members in Colombia and two team members in the U.S. The fifth person (a Colombian living in the U.S.) identified discrepancies in coding and brought those back to the group to discuss and

resolve in meetings conducted via Skype. The resulting refinement of codes and greater consensus enabled us to use one coder from each country and a third person to identify discrepancies for the latter portion of the interviews. Translation into English of extracted quotes was performed by several of the coders and reviewed by other bilingual members of the research team.

## Results

### Quantitative Findings

The mean age of the participants in the quantitative survey was 24 years, and education ranged from some primary schooling to graduate degree. The median income level corresponded to 51,000 to 100,000 Colombian pesos per week (approximately US\$30 to US\$60). Thirty percent of participants had the contributory insurance, 32% had subsidized, 11% had linked, 10% had no insurance, and 17% did not know their insurance coverage. The two latter groups were combined for the analyses. Fifty percent had been tested for HIV at least once and 33% had been tested within the current or previous calendar year.

Table 1 shows correlations for predictor and outcome variables. Because the nondichotomous variables were either ordinal or not normally distributed, we treated them as ordinal and presented Spearman or rank bi-serial correlations. Table 2 provides descriptive data for three groups of participants: those who had had an HIV test within the current or previous calendar year, those who had had an HIV test prior to that time period, and those who had never had an HIV test. Kruskal-Wallis and Chi-Square Tests of Independence indicated that the three groups differed in variables related to demographic characteristics, insurance coverage, risk appraisal, and social context. It was evident, however, that the source of the difference lay in the comparison of those who had never been tested versus the other two groups. There appeared to be very little difference between the more recent and past testers. Although in the whole sample, participants who had ever been tested tended to be older, comparisons among those who had tested previously revealed that younger men were more likely to have done so recently.

Table 3 shows results from the hierarchical logistic set regression analysis with the outcome of ever having had an HIV test. The top portion of the table gives the sequential steps and shows that the models for all four steps were significant. Therefore, the entry of each set provided additional explanation beyond that achieved by the preceding set or sets. Thus, the significant change in the -2 Log Likelihood for the models in steps 1 and 2 indicated that insurance type added to the explanation of ever having had an HIV test beyond that provided by the demographic set alone; and the significant change from step 2 to step 3 indicated that risk appraisal added to the explanation achieved by the demographic and insurance sets. Similarly, the inclusion of the final set showed that the social context delivered significant additional explanatory power beyond the previous model with the demographic, insurance, and risk sets.

The bottom portion of Table 3 shows the final model including all the individual variables from the four sets. These results present a traditional logistic regression, and thus reflect the unique contribution of each single variable, controlling for all other variables in the model.

Although care must be taken in interpretation due to multicollinearity, findings indicated that participants who were older, had higher income, had had an STI, knew more people living with HIV, and had more social support were more likely to have ever been tested. Moreover, insurance coverage was a significant predictor. Results show two types of comparisons for insurance type. The individual contrasts seen in the Wald Chi Square results reflect comparisons of each type of insurance with a combined group containing all other types, including the reference group of individuals who had no insurance or who did not know their insurance. The results displayed in the adjusted odds ratios reflect comparisons between each of the three main types of coverage with the reference group only.

As expected, coverage under the contributory plan was associated with a greater likelihood of ever having an HIV test. Moreover, the adjusted odds ratio indicated that HIV testing was almost twice as likely among individuals with contributory insurance as among individuals who had no insurance or who did not know their insurance. In a comparison with all other participants, those with subsidized insurance were found to have a lower likelihood of testing, due in part to the impact of participants with the contributory plan in the comparison group. As the adjusted odds ratios show, however, there was no evidence that participants who had subsidized insurance or linked insurance differed from the group including those without coverage or without knowledge of their coverage.

### Qualitative Findings

The MSM sample for the in-depth interviews included 11 men who had never had an HIV test, and 9 men who had been tested. Of these, two participants (PT18, PT19) had been tested for the first time when they took part in the quantitative component of this research project. Two others (PT15, PT16) reported that they had been tested, but had had long gaps (e.g., 8 or 10 years) between tests. Two participants (PT14, PT20) had been tested twice, and three others (PT01, PT07, PT13) reported testing regularly. The mean age of MSM in the in-depth interviews was 26 years. All had at least a high school or technical school education, and about half had attended university.

Table 4 shows themes and selected quotations from the narratives of MSM and key informants, which were combined for the purpose of describing results. We included illustrative quotations but tried to avoid redundancy. There were additional narratives with similar content for all themes except the first one shown in the table: support for testing. This theme emerged in a small number of interviews with MSM, and the accounts suggested little encouragement for testing. Moreover, it was interesting to note that in the narratives where there was support for testing from friends, the friends tended to be female. Only a few participants mentioned that their partners had promoted the idea of testing.

A second theme concerned reasons for HIV testing. One MSM noted that a motivation for HIV testing was his belief that it was his personal responsibility. In contrast, as can be seen in Table 4, the main reason for testing given by the MSM or described by key informants was perceived risk. Several participants noted that they did not need to get tested because they were at low risk for HIV. In some cases, however, their descriptions of their own behavior suggested that they were at greater risk than they thought.

A third major theme in participants' and key informants' narratives concerned barriers to testing (see Table 4). Furthermore, there were multiple sub-themes, including lack of information, lack of money, fear of needles, fear of a positive diagnosis, fear of violation of privacy, stigma, and health-care system characteristics. It was evident that a combination of conditions related to these subthemes often magnified the barriers.

Obstacles within the health care system, as well as ways in which system protocols intersected with other barriers, were elaborated by key informants and were evident in the MSM's narratives. Although regulations specify that anyone affiliated with the health care system should be able to receive a free HIV test twice a year (Ministro de la Protección Social de la República de Colombia, 2006), many participants were unaware of their right to be tested, and many insurance companies neither spontaneously offered nor automatically approved testing. Key informants consistently described a common protocol for HIV testing under the subsidized plans which required 1) risk assessment and approval by a doctor; 2) a pre-test counseling session conducted by a nurse, social worker, or other counselor; 3) a blood test for HIV performed by a technician; 4) laboratory processing of the blood; and 5) post-test counseling and delivery of the results by nurses, psychologists, social workers, or other counselors. These procedural impediments were encountered less frequently by people who paid for their own insurance (contributory plan).

The risk assessment requirement was an obstacle described by several participants. Because HIV tests were not ordered unless the doctor judged that the patient was at risk, the fears and embarrassment or shame caused by stigma were sometimes sufficient to keep a person from testing. Thus, this bureaucratic procedure functioned as a powerful barrier to testing in subsidized plans. A key informant noted that hospital-based testing under the linked plan was typically available without risk assessment.

Moreover, a person could need four appointments, often in different locations, in order to complete the process of testing. Because Bogotá is a large and sprawling city, transportation to the various locations costs money and can be extremely time-consuming. Similarly, the time spent waiting to be seen can be long. Even though policies specify that HIV testing should be free, co-payments were required for the various other appointments such as the risk assessment and counseling. Key informants noted that individuals with limited resources are clearly affected by such policies.

The fear of being positive and the fear that one's confidentiality would be violated—concerning not only a positive HIV diagnosis, but also the mere act of testing—were frequently expressed by the MSM. These worries were related to the perceived stigma of HIV and of homosexuality, and they often inhibited candid conversation with medical staff. In addition, participants and key informants described situations illustrating ways in which practices employed in the health care system sometimes justified such fears by involving procedures that could reveal private information in fairly public spaces such as waiting rooms.

Regardless of type of insurance, testing for HIV in Colombia is generally done through blood tests, except in research studies and some community organizations. Several key



informants noted that a barrier associated with blood testing was the unnecessary, bureaucratic requirement by some insurance providers that a patient be fasting at the time of HIV testing. An additional deterrent was the anticipated interval between having an HIV-related blood test and learning the results. We heard reports of waits ranging from three days to a month and a half. One MSM told of needing a month to go to the appointments for the initial approval and pre-test counseling, then having the test, and waiting another month to get the results.

Participants and key informants described the process of testing with non-profit organizations as easier, faster, and more comfortable. Individuals could simply request a test, without having to convince a provider that there was sufficient risk. In gay organizations, participants felt comfortable and less concerned about stigma. Moreover, in some cases, rapid oral tests were used, and therefore individuals with fear of needles felt less distress. At times, however, there was a fee for testing.

## Discussion

As was evident in both the quantitative and qualitative findings, factors related to demographic background, insurance coverage, risk appraisal, and social context were all associated with HIV test among Colombian MSM. Moreover, qualitative descriptions illustrated ways in which these factors exerted combined influence on testing behavior. Conditions and requirements of the health care system served as greater or lesser impediments to testing depending, for example, on a person's income, fears, sensitivity to stigma, and social context.

Consistent with findings in previous research (Galindo et al., 2011; Holt et al., 2011; Li et al., 2012; Mimiaga et al., 2009), demographic factors contributed to the explanation of testing, both on their own and in combination with features of health system. Lower income was associated with lower likelihood of ever having been tested, even in the final simultaneous logistic model that controlled for type of insurance. Financial barriers were also evident in the qualitative findings, which clearly demonstrated the ways in which protocols used by some insurance companies and their service providers placed disproportionate burdens on people with limited income.

Policies that institute routine HIV testing in a variety of settings (e.g., medical emergency rooms, primary care visits) and targeting of high-risk groups have been promoted as a means of increasing detection of HIV (Arrivillaga et al., 2012; Deblonde et al., 2010; Mimiaga et al., 2009). Our data indicated that, despite efforts to establish public health policies to encourage HIV testing in Colombia, access was still restricted by bureaucratic procedures, particularly in subsidized insurance plans, such as requiring a doctor's assessment of patients' risk behavior or denying testing to patients who were not fasting. Because people with contributory insurance tend not to face such barriers, it is not surprising that findings showed that this group was more likely to have been tested than people with other types of insurance. The positive impact of public policies was evident, however, in the availability of free, hospital-based testing for those with linked insurance. Thus, this study demonstrated

that the application of public health policies may be inconsistent and that routine structural barriers can be difficult to overcome, even in government-supported health care systems.

Accounts of fears and anxieties serving as barriers to testing were common. It was clear that many MSM avoid facing the possibility of a positive result by avoiding testing. Concerns about stigma associated with gay sexual orientation or with HIV also affected people's interactions—or lack thereof—with the health care system. Even requesting an HIV test was seen as a potential catalyst for disapproval or judgment, as was disclosing risky behavior during an interview with the doctor. Moreover, stigma also played an important role in magnifying people's fears about violations of confidentiality. Distrust of the health care system and of its procedures for testing and notification of results, in combination with sensitivity to the stigma associated with HIV and homosexuality, created a potent barrier to testing.

Historical conditions in Colombia may have heightened the impact of fear of disclosure of personal information and of stigma in this study. Colombia has suffered over 60 years with varying degrees of civil unrest and armed conflict. Individuals deemed “socially undesirable” have experienced discrimination, internal displacement, and violence perpetrated by armed groups and justified as social cleansing. Thus, disclosure of someone's gay sexual orientation or HIV-positive could have very serious consequences in this environment (Zea et al., 2013), a fact noted by several key informants.

Another aspect of the social context that was linked to testing was social support. As we had hypothesized, those with greater social support were more likely to have been tested for HIV. Instrumental social support could be important in facilitating testing in a variety of ways, including with information, financial help, or transportation. Emotional social support could be useful in alleviating anxiety and fear associated with testing. Although in the qualitative findings social support for testing was not commonly reported, it is evident that encouragement from friends, partners, and others can increase the likelihood that a person will actually get tested.

A personal characteristic that kept people from even considering getting an HIV test was low perceived vulnerability for HIV. Many participants in the qualitative interviews said that they did not think that they themselves were at risk for HIV, even though they also reported having engaged in risky behaviors. Quantitative findings indicated that MSM who reported knowing more people living with HIV were more likely to have been tested. This association may have stemmed from a greater awareness of HIV and its prevalence within the gay community, which would then lead to an increased sense of one's own risk of contracting the infection. It is, however, possible that other factors also contributed to the relationship between knowing people living with HIV and testing. For example, involvement in the gay community could lead to both HIV testing, due to supportive norms and available resources, and to knowing more HIV-positive men, particularly those who are willing to disclose their status.

Similarly, having had an STI can increase one's risk of contracting HIV, as well as one's perception of risk, and therefore, the link between having a previous STI diagnosis and

having ever had an HIV test could be due to perceived vulnerability. Another explanation also seems possible. Faced with a patient presenting with an STI, a doctor would probably have ordered an HIV test. Because we do not know the relative timing of the STI diagnosis and the HIV test, we are only able to speculate about these relationships.

### Limitations

A limitation of this study stemmed from the multiple correlations among predictors, which can result in some instability of results. For example, education—which has been linked to testing in past studies (Holt et al., 2011; Li et al., 2012; Mimiaga et al., 2009; Mukolo et al., 2013)—was not found to be significant in the multi-variable model, presumably due to its substantial overlap with other predictors, such as income and type of insurance. The hierarchical set model partially addressed this limitation by demonstrating the successive contributions of demographic characteristics, insurance coverage, risk appraisal, and social context. Findings supported the argument for the importance of addressing psychosocial factors, as well as demographic characteristics (Mukolo et al., 2013).

Other limitations of the study include the fact that the sample was quite young, which has implications for generalization of findings to older MSM. In addition, the analysis only addressed ever having been tested, whereas public health recommendations call for regular, repeated testing. It is interesting to note that we found minimal differences between those who had tested within the current or previous calendar year compared to those who had tested in the past, which may be due to our not including a measure of sexual risk behavior covering the same time period. Qualitative interviews suggested that the most important motivation for testing was unprotected anal intercourse, particularly with an HIV-positive partner.

### Conclusions

First and foremost, this study indicated that HIV testing of MSM in Bogotá, Colombia is occurring at a much lower rate than recommended. Although public policies have been instituted to increase testing in Colombia, this study demonstrates that their everyday application is often lacking or inadequate. Structural factors related to procedural requirements mandated by insurance companies—particularly under the subsidized coverage—function as barriers to treatment. Because the government is contracting with these companies to provide care, it could exert pressure to eliminate the prerequisite risk assessment necessary to gain approval for testing. Furthermore, insurance companies could be required to perform pre-test counseling and the actual testing at the same time and place. Further training for health-care providers could lessen stigma and increase awareness of privacy issues.

The predominance of blood testing for HIV in Colombia creates barriers arising from fear of needles, additional medical visits, and a minimum wait of several days (though often much longer) for results. These conditions can contribute to a situation in which individuals fail to return to receive their diagnosis, and therefore are not linked to care. The widespread establishment of free rapid testing for preliminary screening would do much to remedy this situation.

Public health programs could also promote testing on a regular basis, such as every six months. Greater awareness of HIV prevalence and incidence of HIV in the community of MSM could lead to a more accurate appraisal of risk and could motivate individuals to seek testing. Campaigns urging friends, relatives, and partners of MSM to provide emotional and practical support for HIV testing could also be created. Findings of this study indicate that efforts to address both individual and structural characteristics are needed to increase detection of HIV among MSM and thus to contribute to the reduction of the epidemic in this highly affected group.

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Table 1

Bivariate Correlations

	Ever Tested	Recency of Testing	1	2	3	4	5	6	7	8	9	10
Demographics												
1. Age	.31****	-.19****										
2. Education	.18****	.06	.07*									
3. Income	.24****	-.04	.42****	.21****								
Health Insurance												
4. Contributory	.23****	.08	.15****	.34****	.28****							
5. Subsidized	-.18****	-.08	-.03	-.18****	-.20****	-.45****						
6. Linked	-.02	.03	-.02	-.02	.02	-.23****	-.24****					
7. None or don't know	-.04	-.04	-.11**	-.14****	-.09**	-.39****	-.42****	-.21****				
Risk appraisal												
8. Ever had STI	.28****	.00	.19****	.11**	.10**	.09**	-.08*	.01	-.01			
9. Know PLWH	.15****	-.06	.27****	-.03	.13****	.01	.05	.00	-.06	.13****		
Social context												
10. Social support	.12***	-.01	-.14****	.32****	.11**	.12***	-.19****	-.01	.09**	.03	-.13****	
11. Experienced homonegativity	.09**	-.00	-.01	.03	-.01	.02	-.08*	-.06	.12***	.16****	.05	.17****

\* p < .05;  
 \*\* p < .01;  
 \*\*\* p < .001;  
 \*\*\*\* p < .0001

Note: N = 890 except for correlations involving recency of testing, which include only those participants who had been tested and could specify the year (N = 443).

Note: Entries represent Spearman correlations for pairs of ordinal variables, Phi coefficients for pairs of dichotomous variables, and rank bi-serial correlations for pairs containing an ordinal and a dichotomous variable.

**Table 2**

Descriptive data for three groups: those who had an HIV test within the current or previous calendar year, those who had a test prior to that, and those who had never had an HIV test.

Variable	Group Mean/Median or Percent		
	Recent Testers (N=291)	Past Testers (N=152)	Non-Testers (N=445)
Demographics			
Age***	24.7 / 23	27.5 / 25	22.6 / 22
Education*** (range: 1-10)	6.7 / 7	6.6 / 7	6.2 / 7
Income*** (range: 0-7)	3.1 / 3	3.3 / 3	2.1 / 2
Health Insurance			
Contributory***	43%	34%	19%
Subsidized***	22%	29%	41%
Linked	11%	9%	11%
None or don't know	24%	28%	29%
Risk Appraisal			
Ever had STI***	42%	41%	17%
Know people with HIV *** (range: 0-3)	0.9 / 1	1.1 / 1	0.7 / 0
Social Context			
Social support** (range: 0-4)	2.2 / 2.2	2.2 / 2.2	1.9 / 2.0
Experienced homonegativity	1.1 / 1.0	1.1 / 1.3	1.0 / 1.0

\* p < .05;

\*\* p < .01;

\*\*\* p < .0001

Note: Kruskal-Wallis Tests were used for non-parametric analysis of group differences on ordinal variables. Chi-square tests for Independence were used for analysis of group differences on dichotomous variables.



**Table 3**

Hierarchical logistic set regression examining contribution of demographic, insurance-related, risk-related, and social characteristics to ever having been tested for HIV (N = 890)

<b>Model</b>	<b>-2 log L</b>	<b>Overall Model</b>	<b>Change in -2 log L</b>	<b>df for Change</b>
Set 1: Demographics	1114.47	$X^2(3) = 92.16^{****}$		
Set 2: Health Insurance	1092.97	$X^2(6) = 108.23^{****}$	21.50 <sup>****</sup>	3
Set 3: Risk appraisal	1045.60	$X^2(8) = 138.01^{****}$	47.36 <sup>****</sup>	2
Set 4: Social context	1033.78	$X^2(10) = 143.84^{****}$	11.82 <sup>**</sup>	2

  

<b>Final Model</b>	<b>Coefficient</b>	<b>Wald X<sup>2</sup></b>	<b>Adj. OR</b>	<b>95% C.I.</b>
Intercept	-4.35	52.34		
Set 1: Demographics				
Age	0.09	28.09 <sup>****</sup>	1.10	1.06 – 1.14
Education	0.11	3.89 <sup>*</sup>	1.12	1.00 – 1.25
Income	0.10	6.61 <sup>*</sup>	1.11	1.02 – 1.20
Set 2: Health Insurance				
Contributory	0.49	13.32 <sup>***</sup>	1.72	1.15 – 2.59
Subsidized	-0.36	7.78 <sup>**</sup>	0.74	0.50 – 1.08
Linked	-0.09	0.24	0.97	0.57 – 1.62
Set 3: Risk appraisal				
Ever had STI	1.05	36.51 <sup>****</sup>	2.85	2.03 – 4.00
Know PLWH	0.19	5.68 <sup>*</sup>	1.21	1.04 – 1.42
Set 4: Social context				
Social support	0.27	9.25 <sup>**</sup>	1.31	1.10 – 1.55
Experienced homonegativity	0.12	0.71	1.13	0.85 – 1.49

Note: Adj. OR = Adjusted Odds Ratio.

\* p < .05;

\*\* p < .01;

\*\*\* p < .001;

\*\*\*\* p < .0001.

**Table 4**

Themes and quotations from qualitative interviews

<b>SPEAKER</b>	<b>QUOTATION</b>
<b>Theme: Support for testing</b>	
<i>Sub-theme: Lack of support</i>	
PT02	No one has ever said to me, "Let's get tested." Never, never, never.
<i>Sub-theme: Support from Friends</i>	
PT07	I have many lesbian friends [who have suggested that I get tested].
PT11	A female friend advised me to get tested. "Do you need money? Do you need me to take you? To go with you?" The support is important.
PT12	A female friend recommended [that I get tested]. I told her that I was homosexual, and she said, "Why don't you get tested? It is very important."
PT20	A [male] friend... informed me that [a research study] was doing free tests, so I took advantage of that.
<i>Sub-theme: Support from Partners</i>	
PT13	{ <i>Speaking of his conversation with the partner with whom he has a stable, non-monogamous relationship.</i> } We are always saying, "Hey, get tested because it's been six months. One has contact with the virus all the time".
PT17	My current partner and I have helped each other, because we tell each other, "Let's do it. Let's get it over with." [However, this person has not been tested]
<b>Theme: Reasons for testing</b>	
<i>Sub-theme: Sense of responsibility</i>	
PT01	I began to think that I owe it to myself, to get tested every six months.
<i>Sub-theme: Risk perception</i>	
PT01	{ <i>When asked why he was tested five times</i> } Because I was so promiscuous.
PT05	[I always have sex] with a condom and with a stable partner. Therefore, I don't think that I need to get tested.
PT12	I've been with various partners and two stable partners.... I think that it would be healthy to get tested, because even though I consider myself at low risk, it is still important. {However, this person has not been tested.}
PT15	I had my first test because I was starting a relationship with a partner who had had a reactive test a month earlier. { <i>This person did not have a second test for 10 years, which he explained.</i> } I didn't see the need to do it.
PT18	You think that it is not going to affect you. I mean, not me, so why should I have to get tested? { <i>This person had tested positive in the quantitative phase of this research project.</i> }
KI06	There are three circumstances under which people agree to be tested: When they realize that they had risky sex, when one of their partners is diagnosed with HIV, or when they get sick and a physician requests the test.
KI09	Unfortunately many people get tested only because they have had a risky episode, or when they find out that a boyfriend from 5 years ago got sick and died, and they don't know why.
KI10	People engage in risky behaviors and then get tested; they engage in risky behaviors and then get tested; they engage in risky behaviors and then get tested, until one day the test results are positive.

SPEAKER	QUOTATION
<b>Theme: Barriers to testing</b>	
<i>Sub-theme: Fear of needles</i>	
PT02	I'm afraid [to get a blood test for HIV], but I've had blood drawn for other tests.
PT10	I'm afraid of needles, but the important thing is to know if one is okay or not. {However, this person has not been tested.}
<i>Sub-theme: Stigma</i>	
PT02	{ <i>Explaining why he would not ask for an HIV test</i> } Because of the way the doctor would look at me.... I mean, there are people who have requested an HIV test, and the doctor backed away...as if he were seeing a "sidoso" [a pejorative term for someone with AIDS].
PT03	{ <i>Explaining why he has never discussed his sexual orientation with a doctor</i> } He would send me to get tested,... and I'm afraid because of the stigma around HIV.
PT04	If I told my family that I was going to have an HIV test, they would think that I have sex with guys or that I'm gay.
PT12	{ <i>Explaining why he is reluctant to ask a doctor for an HIV test</i> } I think it is somewhat difficult because I'm very shy.... It would bother me that they would think that "this guy has been going to bed with a lot of guys" or something like that.
KI09	The social stigma is so huge for someone with HIV: the consequences can be enormous. So [people] don't get tested or they don't request the test.
KI11	In the context of a country like ours, where there is so much stigma and discrimination, not only would they kick you out of the house, but they could displace you or kill you.
<i>Sub-theme: Fear of lack of confidentiality</i>	
PT02	[If I were to get tested], what if my friends found out? I might lose my friends because they found out that I had HIV/AIDS. My family might reject me; I might end up alone; no one would love me; all of that.
PT07	{ <i>Describing the process for calling people for consultations concerning test results in the waiting room at his health care provide</i> } There is a big notebook, a red notebook, where all the people with HIV are listed.
PT13	One goes to get the test and encounters all his friends there. And [the staff] comes out and yells, for example, "Hey, reactive patient. Send him to see the doctor." There is no protocol that guarantees confidentiality.
PT15	I think that people are a little afraid because they still don't trust the health care system or the people who do the testing. People think that the information will slip out from somewhere, and someone will learn their status at some point.
PT17	{ <i>Describing the process in his EPS, where tests results are given in an envelope with other people present</i> } Seeing oneself exposed is not cool.... Everyone is looking.... pointing out "this guy probably has something."
PT17	{ <i>This person, who described himself as a public figure, explained that he tried to get tested abroad.</i> } The issue is not to leave evidence.
KI03	Many people come [to Bogotá] from small towns in other states because they fear confidentiality could be violated [in their small towns] or because their cousin or their friend works at the hospital. And here [in Colombia] barriers can be complex: with our armed conflict, people are afraid that their information could be leaked...
<i>Sub-theme: Lack of money</i>	
PT11	I was very young and dependent on my parents. I would have had to tell my parents that I needed money for a medical appointment. How would I justify it?
PT16	If I needed to get an emergency HIV test because I had risky sex or I was with someone who told me that he was positive, I would have to pay out of pocket [an amount] that would be complicated for me right now.... Therefore, I would possibly opt not to get tested and to wait until I had the money to do it.
KI02	{ <i>Describing how some people approach testing</i> } "If in addition to having to pay \$45,000 pesos, that test might mean that I am going to die soon. In that case I prefer not to know." That is a lot of money.

SPEAKER	QUOTATION
KI04	The context of vulnerability is a challenge. A patient from Ciudad Boivar, making less than \$300,000 pesos per month, has to go to one clinic to receive the referral, then to the EPS for the authorization, then another trip back to the hospital to get the lab tests. Transportation costs become prohibitive.
<i>Sub-theme: Lack of correct information</i>	
PT08	I don't have much information about where to go or how to access [HIV testing].
PT13	This is not the case for me, but lack of knowledge is everywhere. No one knows that ... the test is a right that people can demand, therefore no one accesses the test.... Another barrier is the fear of HIV that is generated by the lack of knowledge regarding the infection itself.... We've been sold the idea that AIDS equals death and HIV equals AIDS.
KI05	Many hospitals don't promote testing because even they don't know that in the health care system a person is entitled to two tests per year.
KI09	There are lots of misconceptions about HIV.
<i>Sub-theme: Fear of being positive</i>	
PT02	<i>[Describing how he would feel if he found out he was positive.]</i> I would think of the future that lies ahead for me.... It would be so, so different. I would have to take care of myself, see the doctor all the time.... It would be a psychological trauma... being day and night, every second, thinking "I have this disease and I might die."
PT08	I believe that it is the fear of finding out yes or no. People say, "If I am positive, I die. My life is over. And if I am negative, I wouldn't know what to do."
PT09	Given that I have never been tested [and have had some risky sex], it makes me anxious to open the envelope, when I don't know if it will say yes or no.
PT11	Having to face [a positive diagnosis] with my partner and my family.... Why would I worry them with that? I would take the treatment without their knowing.
PT16	Obviously, it is scary, especially when you know that you have taken risks.... I think that most people would prefer to remain ignorant.
KI04	<i>[Quoting people with whom he or she engages in work]</i> "I don't want to find out that I am going to die. If I have HIV, I'd rather not know." That is all part of the stigma and discrimination of HIV.
KI09	Fear of the results is what stops people from accessing the test. Many come to get tested and don't come back for the results.
<i>Sub-theme: Health care system barriers</i>	
PT11	<i>[Describing being turned away for testing]</i> The [staff person] told me that I could not be under the influence of alcohol or have the flu.
PT13	If the protocol requires a venipuncture blood test, then it has to be a venipuncture blood test. If the protocol requires that the patient be fasting, then the patient has to be fasting.... Many people don't want to get up early in order to be stuck [with a needle], and moreover to go without eating, so I think that creates a barrier to accessing [the test].
PT13	I had to endure the whole process of profiling that the doctor goes through to decide whether to order the test, as if I [did not know my own risk]. So I had to tell him that I live and have sex with a serodiscordant partner, which is something that I shouldn't disclose to anyone, but until I said that, he refused to approve the test.
PT13	In an EPS, from the door man to the nurse, the psychologist, the sociologist, the social worker, etc., there are moralistic attitudes.... If the security guard is homophobic and you act like a queen, he would beat you up and throw you out in the street.
PT14	Every time I get tested, they start inquiring about my personal life.
PT14	To avoid doing the test, [the EPS staff] say that there are no counselors, therefore, they cannot do the test.
PT14	I had to pay the co-payment [so the doctor] would refer me for pre-test counseling. Then I had to pay the co-payment for the counseling.... and [to spend] an hour and a half [to go between locations] and [pay for] transportation.... Moreover, everyone finds out that one is there to get an HIV test.
PT19	There are many structural problems. Many EPS don't have testing facilities, but they should have their own facilities, rather than referring everyone to a different location.
KI01	It's easiest for a person with contributory insurance to be referred for testing. You go, they authorize the test for you, and you leave having been tested, maybe having some counseling in between.... But if you are a person with subsidized insurance, you have to deal with the EPS. You go get authorization, which is a process that can take time, because generally that authorization takes place elsewhere. That means that it becomes a geographic barrier.

SPEAKER	QUOTATION
KI03	Many health institutions are intimidating..., so the patient does not open up with the doctor. Moreover, doctors are not trained to provide HIV counseling.
KI04	A person has to go to the appointment [for the test], and it is one trip; he goes back home, it's another trip. He goes to the appointment to get the results and post-test counseling, that is another trip; and then he goes home. These multiple trips come out of his pocket. If the person makes more than two or three times the minimum wage, he can handle it... but if he only makes \$300,000 pesos a month, he is in trouble. He might say "why am I going to spend all that [money] in transportation, when I don't have money to buy meat or a pound of rice for dinner?"
KI05	It is necessary to convince doctors to overcome their prejudices.