HIV testing practices among men who have sex with men in Buenos Aires, Argentina

Alex Carballo-Díéguez*a, Iván C. Balán*a, Curtis Dolezalb, María A. Pandoc,e, Rubén Maroned, Victoria Barredad and María Mercedes Ávilab,e

aHIV Center for Clinical and Behavioral Studies, New York State Psychiatric Institute and Columbia University, New York, NY, USA; bInstituto de Investigaciones Biomédicas en Retrovirus y SIDA (INBIRS), Facultad de Medicina, Universidad de Buenos Aires, Buenos Aires, Argentina; cConsejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Buenos Aires, Argentina; dNexo Asociación Civil, Buenos Aires, Argentina

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The objective of the study was to explore HIV-testing practices among men who have sex with men (MSM) in Buenos Aires, Argentina, in light of current international health guidelines that recommend frequent HIV testing for MSM who engage in high-risk behavior. Participants, who were recruited using respondent-driven sampling (RDS), were 500 mostly young, nongay-identified MSM of low socioeconomic status, high levels of unemployment, living mainly in the less-affluent areas surrounding Buenos Aires, and lacking health insurance. They provided blood samples for HIV testing and responded to a Computer Assisted Self Interview. Fifty-two percent had never been tested for HIV, and 20% had been tested only once; 17% were found to be HIV infected, of whom almost half were unaware of their status. Main reasons for never having tested previously were: not feeling at risk, fear of finding out results, and not knowing where to get tested. Among those previously tested, men had been tested a median of 2 times with their most recent test having occurred a median of 2.7 years prior to study enrollment. Of those who had not tested positive before entering the study, only 41% returned for their results. HIV testing was infrequent and insufficient for early detection of infection, entry into treatment, and protection of sexual partners. This was particularly the case among nongay-identified MSM. Testing campaigns should aim to help MSM become aware of their risk behavior, decrease fear of testing by explaining available treatment resources and decreasing the stigma associated with HIV, and by publicizing information about free and confidential testing locations. Rapid HIV testing should be made available to eliminate the need for a return visit and make results immediately available to individuals who are tested.

Keywords: HIV prevalence; gay; respondent-driven sampling; MSM

Introduction

Regular HIV testing facilitates early detection of infection among at-risk individuals, and early HIV detection is directly associated with improved clinical outcomes and decreased sexual risk behavior (Oberzaucher & Baggaley, 2002; Weinhardt, Carey, Johnson, & Bickham, 1999; World Health Organization, 2004). Early and successful treatment of HIV-infected individuals with antiretrovirals (ARVs), significantly decreases the chances of HIV transmission to partners. A study involving mainly heterosexual serodiscordant couples showed that this decrease was 96% (Cohen et al., 2011); to date, no comparable data are available for men who have sex with men (MSM).

The US Centers for Disease Control and Prevention (CDC, 2010, 2011) recommend testing every three to six months for sexually active MSM. Given that large percentages of HIV-infected persons are unaware of their infection (MacKellar et al., 2006; Sifakis et al., 2010), especially among MSM who remain at disproportionate risk of infection (Adam et al., 2009; Sumartojo et al., 2008), frequent testing is important. Although the percentage of MSM who have never tested for HIV is decreasing (Helms et al., 2009), many MSM remain untested or test infrequently (CDC, 2011; Guy et al., 2010; MacKellar et al., 2006; Manning et al., 2007). Likelihood and frequency of testing may be related to demographic characteristics such as sexual identity, age and ethnicity (Nelson et al., 2010; Sifakis et al., 2010; Wei et al., 2011); and to fear of positive results, perceived HIV risk, and beliefs about HIV treatment (Kellerman et al., 2002; Mikolajczak, Hespers, & Kok, 2006; Song et al., 2011).

Most of the research on frequency of HIV testing has occurred in the US, Europe, Australia, and China. Little is known about the frequency of HIV testing among Latin American MSM and the factors that facilitate or impede testing among this population. In Argentina, which has an estimated 134,000 HIV-infected individuals (Ministerio de Salud, 2011) and where the government provides free HIV treatment, regular HIV testing among high-risk populations

*Corresponding author. Email: ac72@columbia.edu

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could significantly impact HIV mortality and prevention efforts. MSM, whose HIV prevalence and incidence rates in the city of Buenos Aires are 17.3% and 4.53 per 100 person-years respectively (Pando et al., 2011), could benefit greatly from frequent testing.

We aim to contribute to the understanding of HIV testing among MSM in Latin America by reporting on a sample of 500 demographically diverse MSM from Buenos Aires, Argentina (additional results in Balán et al., 2011; Barreda et al., 2010; Carballo-Díez, Ávila, et al., 2011; Carballo-Díez, Balan, et al., 2011; Pando et al., 2011; Pando et al., 2012). We explored HIV testing history, patterns, reasons for testing or not, and the association of these variables with demographic characteristics and sexual identity.

Materials and methods

Ethics statement

The Institutional Review Boards of the New York State Psychiatric Institute, USA, and la Facultad de Medicina, Universidad de Buenos Aires, Argentina, approved this study.

Participants

Recruitment took place through respondent-driven sampling (RDS; Heckathorn, 1997, 2002) a method for both data collection and statistical inference. In RDS, a few participants ("seeds") are recruited to participate in the study and to invite three others from their network to enroll as well. Participants give coupons to those they invite who can then also recruit people from their networks until the target number is reached. Participants are offered dual incentives (for participation and for each person they recruit) thus producing chains of referrals that move away from the initial seeds. Participants report the number of people in their network who belong to the target population; this number is used to weight the data. This weighting strategy distinguishes RDS from simple snowball sampling. Although RDS is purportedly better than snowball sampling to reach more representative samples of hidden populations, one drawback is that it tends to cluster cohesive subpopulations (Goel & Salganik, 2010). Also, by nature, RDS allows for selection bias, as peers invited to participate may screen themselves out without ever making contact with the recruitment staff.

Eligibility criteria for our study were to identify as a man, be at least 18 years old, have had sex with another man or a transgender woman (TGW; male-to-female) in the prior six months, have had sex with a man or TGW at least 10 times in his lifetime (to exclude individuals with infrequent occasions), reside in Buenos Aires or its environs, have received a coupon from a prior participant (not applicable to seeds), and agree to provide a blood sample for HIV and sexually transmitted infection (STI) testing.

Procedure

A detailed description of the use of RDS in this study has been published elsewhere (Carballo-Díez, Balan, et al., 2011). Briefly, 16 socioeconomically diverse seeds were recruited, underwent all study procedures, and were given three coupons (valid for 60 days) to pass on to members of their networks. In total, 500 MSM (our target sample by study design) were recruited from November 2007 through July 2009 and seen at the offices of Nexo Asociación Civil, our nongovernmental organization (NGO) partner. Men who met eligibility criteria provided written consent and answered a password-protected, Web-based, computer-assisted self-interview (CASI) that inquired, among other topics, about demographic information, sexual identity, and HIV testing history. Participants who did not feel comfortable using a computer could ask for assistance from a research assistant who then read the questions verbatim and entered the participant’s responses.

Next, blood was drawn for HIV and other STI testing (additional results and prevalence of other STIs appear in Pando et al., 2012). HIV pre-test counseling was provided to all participants, and post-test counseling to those who received their results. Finally, the research assistant administered the Social Network Assessment (described below), handed the participants three coupons, encouraged each participant to “give the coupons to people like you”, and took contact information to notify participants when they could redeem compensation for participant referral. Altogether, the interviews lasted from two to three hours, each participant receiving the equivalent of 20 US dollars (price of five movie tickets) as compensation for his time. For each referred acquaintance who qualified for the study, regardless of whether he enrolled or not, participants received US$5.

Instruments

Demographics

The structured questionnaire covered age, education, income, work status, residence, civil status, and health insurance.
Sexual identity
Participants indicated whether they considered themselves (1) gay/homosexual, (2) bisexual, (3) transvestite (in Buenos Aires, the term transvestite rather than transgender is frequently used), (4) heterosexual, or (5) other. The study was not designed to include transgender persons; those identifying as such were deemed ineligible to participate.

Social network
To determine the participant’s social network size, we asked: (1) “Approximately, how many men who have sex with other men and/or transvestites do you know personally?” (2) “Of those men, how many do you know by name, who they are, and how to contact them?” (3) “Of those men, how many also know you?” (4) “Of these men, with how many have you been in contact in the past six months? Contact may be face-to-face, by phone, or email.” (5) “Of those men, how many live in Buenos Aires?” (6) “Of those men, how many are 18 years or older?” (7) “Of these men, how many might be willing to participate in this study?” (8) “Who gave you the coupon to participate in this study (study personnel, friend, partner, family member, workmate, someone unknown, other)?” We used question 7 to measure network size for RDS weighting purposes.

HIV testing history
We inquired whether the participants had tested for HIV previously, reasons for never testing, assumptions about status among those not tested, reasons for first testing among those tested, and frequency of testing for those with more than one test.

HIV test
HIV diagnosis was assessed using ELISA and agglutination techniques and confirmed by Western Blot at the Centro Nacional de Referencia para el SIDA (CNRS). Facultad de Medicina, Universidad de Buenos Aires.

Statistical analysis
All data have been weighted based on reported network size. The weighting estimator is based on the RDS II estimator (Volz & Heckathorn, 2008). More details on this analytic strategy are reported elsewhere (Carballo-Díéguez, Balan, et al., 2011). Statistical analyses were conducted using PASW Statistics® (Version 18). Participants were classified by sexual identity and by HIV testing prior to study participation (Y/N). Four- and two-group comparisons were conducted using chi-square tests for dichotomous/categorical variables and t-tests or ANOVAs for continuous variables.

Results
Sample
Of the 500 MSM in the sample, 24.5% identified as gay, 36.2% as bisexual, 21.9% as heterosexual, and 17.4% as other. Those responding as “other” tended to be younger and of lower education level. They provided labels such as “hombre” (man), “macho”, and “activo” (active) that did not allow clear assignment to any of the other three categories.

Table 1 presents the demographic characteristics of the sample by sexual identity. Participants’ mean age was 30.5 (SD 11.5); almost half of participants were 18–25 years old, with gay-identified men being older on average than nongay men. Two-thirds had not completed high school; lower levels of education were reported by the nongay-identified men. Twenty-nine percent had no income; nongay-identified men earned less than gay-identified men. Almost one-third of participants were unemployed, and a similar proportion only had temporary work (categories could overlap). Twenty-nine percent of participants resided in Ciudad Autónoma de Buenos Aires (Buenos Aires proper, the Capital city), while the majority of participants came from the less-affluent suburbs of the West Zone and South Zone. Most participants were single (same sex marriage was legalized in Argentina after recruitment for this study was concluded). Four out of 5 participants had no private or employer-supported health insurance (and probably relied on public hospital services); gays were more likely to have employer-supported health insurance. In sum, this was a sample of young, mostly single, nongay-identified MSM, of low socioeconomic status (especially among the nongay-identified), high levels of unemployment, living mainly in the less-affluent areas surrounding Buenos Aires, and mainly lacking health insurance.

HIV testing
Table 2 shows the HIV testing history of the sample. About half of participants had never been tested for HIV; one-fifth had been tested only once. Gay-identified men reported the highest rates of HIV testing. There was a significantly higher proportion of tested individuals among those with only one partner in the prior two months than among those with multiple partners ($77 \vs 44\%, \chi^2 = 17.3, df = 1,$
p < 0.001). Laboratory results of HIV tests conducted as part of our study showed an overall HIV prevalence of 17%. Fifty-six percent of individuals who tested HIV positive in the study were already aware of their status, and 4% reported previous AIDS diagnoses. By contrast, 44% of individuals were unaware of their infection until they were tested during our study. Those who had been tested before entering the study had their last test done a median of 2.7 years before (range, 1 month to 27 years). Twelve percent reported being tested in the past year, and an additional 30% reported being tested in the past 2 years. Forty percent reported that their most recent test was 4 or more years ago. The four sexual identity groups did not significantly differ on time since last HIV test.

Table 3 shows the reasons for not testing among those never tested before. The most frequent reasons for not testing were low risk perception, fear of learning the results, and/or not knowing where to get tested. More gay than nongay-identified men reported not knowing where to get tested and cost as a reason for not testing. These gay men were significantly younger and had lower incomes than gay men who had been previously tested.

Table 4 shows the reasons for testing among those tested before joining the study. Almost half of the men claimed their primary reason was simply to know if they were infected; 19% were tested as part of a physical exam. Only 16% reported having been tested because of unprotected sex. Thirteen percent
said testing was required by their employers (this was more common among nongay-identified men). Five percent got tested because they were experiencing symptoms, and all but one of these participants was HIV infected.

Among those tested, the median number of testing occasions was 2 (not shown in the tables). HIV testing confirmed the self-reported HIV status of 89% of individuals with discrepancies in the remaining 11% (7% of participants assumed being HIV-negative but were found to be infected; 4% of participants assumed being infected but were actually uninfected). Test results were available for participants about two weeks following sample collection. After weighting, 181 (41% of 442) of those who had not previously tested HIV-positive returned to the testing site for their results. Gay men were more likely to return for their results than nongay-identified men (59% vs. 36%, \(\chi^2 = 16.14, df = 1, p < 0.001\)).

Table 5 presents the associations of demographic variables and HIV testing history. No prior HIV testing was associated with younger age, lower education and income, being unemployed (and inversely related to being self-employed or a student), living in the less-affluent areas of the city (West and South zones), being single, having no health insurance, and having a smaller network size.

**Discussion**

In this RDS-recruited MSM sample, HIV testing was infrequent and insufficient for early detection of infection, entry into treatment, and protection of

|               | Total | Gay | Bisexual | Hetero | Other | 4-Groupa | 2-Groupa |
|---------------|-------|-----|----------|--------|-------|----------|----------|
|               | (N = 500) | (n = 123) | (n = 181) | (n = 109) | (n = 87) |          |          |
| Number of times tested for HIVb | 2.5 (7.9) | 4.3 (9.9) | 2.2 (8.3) | 1.9 (6.5) | 1.2 (4.4) | 14.6s <.001 | −5.7174 <0.001 |
| HIV testing history |       |     |         |        |       |          |          |
| Never tested    | 52% | 28% | 56% | 58% | 71% | 45.6s <.001 | 39.12 <0.001 |
| Tested only once | 20% | 24% | 18% | 21% | 14% |          |          |
| Tested more than once | 28% | 48% | 26% | 20% | 15% |          |          |
| HIV infected per lab results | 17% | 31% | 14% | 11% | 12% | 21.5s <.001 | 20.8s <0.001 |
| Among those who tested positive... |       |     |         |        |       |          |          |
| Knew he was HIV infected | 56% | 71% | 46% | 50% | 17% | 8.53 0.037 | 6.41 0.011 |
| Did not know he was HIV infected prior to this study | 44% | 29% | 54% | 50% | 83% |          |          |
| Previously diagnosed with AIDS | 4% | 10% | 2% | 2% | 1% | 15.6s 0.001 | 15.5s 0.001 |

Notes: *4-Group statistical tests compare the 4 sexual identity groups using ANOVAs for the continuous variable and chi-square tests for categorical variables. 2-Group statistical tests compare the gay identified men to all other participants using *t*-tests for the continuous variable and chi-square tests for categorical variables.

*bData were log-transformed prior to statistical tests due to skewed distribution.

Table 2. HIV testing history and prevalence by sexual orientation.

|               | Total | Gay | Bisexual | Hetero | Other | 4-Groupa | 2-Groupa |
|---------------|-------|-----|----------|--------|-------|----------|----------|
|               | (N = 250) | (n = 35) | (n = 99) | (n = 60) | (n = 56) |          |          |
| Number of times tested for HIVb | 2.6 (7.9) | 4.3 (9.9) | 2.2 (8.3) | 1.9 (6.5) | 1.2 (4.4) | 14.6s <.001 | −5.7174 <0.001 |
| HIV testing history |       |     |         |        |       |          |          |
| Never tested    | 52% | 28% | 56% | 58% | 71% | 45.6s <.001 | 39.12 <0.001 |
| Tested only once | 20% | 24% | 18% | 21% | 14% |          |          |
| Tested more than once | 28% | 48% | 26% | 20% | 15% |          |          |
| HIV infected per lab results | 17% | 31% | 14% | 11% | 12% | 21.5s <.001 | 20.8s <0.001 |

Notes: *4-Group statistical tests compare the 4 sexual identity groups using ANOVAs for the continuous variable and chi-square tests for categorical variables. 2-Group statistical tests compare the gay identified men to all other participants using *t*-tests for the continuous variable and chi-square tests for categorical variables.

Table 3. Reasons for not testing among those never tested.

|               | Total | Gay | Bisexual | Hetero | Other | 4-Groupa | 2-Groupa |
|---------------|-------|-----|----------|--------|-------|----------|----------|
|               | (N = 250) | (n = 35) | (n = 99) | (n = 60) | (n = 56) |          |          |
| Don’t feel at risk | 32% | 35% | 34% | 33% | 25% | 1.73 0.632 | 0.2 0.671 |
| Fear of finding out results | 30% | 24% | 31% | 28% | 34% | 1.21 0.742 | 0.9 0.349 |
| Not knowing where to get tested | 20% | 34% | 14% | 30% | 13% | 12.0s 0.007 | 4.9 0.027 |
| Always using condoms | 12% | 11% | 7% | 10% | 21% | 7.53 0.058 | 0.0 0.980 |
| Shame to be perceived as homosexual | 12% | 9% | 11% | 15% | 11% | 1.01 0.804 | 0.4 0.552 |
| Fear of prejudice or discrimination due to requesting the HIV test | 11% | 15% | 6% | 13% | 14% | 4.03 0.258 | 0.6 0.430 |
| Cost | 7% | 17% | 6% | 5% | 4% | 7.21 0.066 | 6.9 0.009 |

Notes: *4-Group statistical tests compare the 4 sexual identity groups and 2-Group statistical tests compare the gay identified men to all other participants using chi-square tests.
Table 4. Reasons for testing among those previously tested.

| Reason for Testing                              | Total \((N = 232)\) | Gay \((n = 87)\) | Bisexual \((n = 79)\) | Hetero \((n = 43)\) | Other \((n = 23)\) | 4-Group* \(\chi^2\) | p    | 2-Group* \(\chi^2\) | p    |
|------------------------------------------------|----------------------|------------------|-----------------------|------------------|------------------|----------------|------|----------------|------|
| Wanting to know if he was infected             | 46%                  | 55%              | 44%                   | 41%              | 33%              | 4.74           | 0.197| 3.81           | 0.051|
| It was part of a physical                      | 19%                  | 14%              | 20%                   | 25%              | 22%              | 2.73           | 0.049| 2.31           | 0.129|
| Had had unprotected sex                        | 16%                  | 17%              | 14%                   | 14%              | 17%              | 0.53           | 0.927| 0.41           | 0.549|
| It was required by employer                    | 13%                  | 8%               | 18%                   | 7%               | 30%              | 10.73          | 0.001| 3.41           | 0.065|
| Found out that a sex partner was HIV-infected  | 7%                   | 7%               | 6%                    | 5%               | 9%               | 0.53           | 0.921| 0.11           | 0.818|
| Accompanied friend to testing site and took    | 6%                   | 7%               | 5%                    | 5%               | 9%               | 0.73           | 0.874| 0.11           | 0.808|
| courage to get tested                          |                      |                  |                       |                  |                  |                |      |                |      |
| Had experienced symptoms                       | 5%                   | 6%               | 6%                    | 0%               | 9%               | 3.23           | 0.036| 0.11           | 0.744|

Notes: *4-Group statistical tests compare the 4 sexual identity groups and 2-Group statistical tests compare the gay identified men to all other participants using chi-square tests.

Table 5. Demographic differences based on prior HIV testing history.

|                        | No prior HIV test \((N = 250)\) | Prior HIV test \((N = 232)\) | M (SD) | M (SD) | t/M/Beta/ OR* | p    |
|------------------------|---------------------------------|-------------------------------|--------|--------|--------------|------|
| Age                    | 27.5 (10.9)                     | 34.1 (11.4)                   | −6.560 | <0.001 |                |      |
| Educationb             | 4.0 (1.4)                       | 4.7 (1.9)                     | 0.18   | <0.001 |                |      |
| Monthly incomec        | 1.9 (0.8)                       | 2.3 (1.0)                     | 0.14   | 0.005  |                |      |
| Network size           | 2.6 (1.8)                       | 3.2 (2.1)                     | 0.15   | 0.002  |                |      |
| Work statusd           |                                 |                               |        |        |               |      |
| Temporary work         | 32%                             | 30%                           | 0.91   | 0.655  |                |      |
| Unemployed             | 37%                             | 25%                           | 0.67   | 0.055  |                |      |
| Employed by employer   | 22%                             | 28%                           | 1.42   | 0.115  |                |      |
| Self employed          | 17%                             | 28%                           | 1.59   | 0.047  |                |      |
| Student                | 15%                             | 22%                           | 0.41   | 0.001  |                |      |
| Place of residencee    |                                 |                               |        |        |               |      |
| Ciudad Autónoma de Buenos Aires | 22%                        | 37%                           | 0.68   | 0.046  |                |      |
| West Zone              | 58%                             | 48%                           |        |        |                |      |
| South Zone             | 19%                             | 12%                           |        |        |                |      |
| North Zone             | 1%                              | 4%                            |        |        |                |      |
| Civil statusf          |                                 |                               |        |        |               |      |
| Single                 | 83%                             | 73%                           | 0.78   | 0.290  |                |      |
| Married                | 2%                              | 6%                            |        |        |                |      |
| Other                  | 15%                             | 21%                           |        |        |                |      |
| Health insuranceg      |                                 |                               |        |        |               |      |
| None                   | 86%                             | 71%                           | 2.17   | 0.001  |                |      |
| Employer-supported     | 13%                             | 25%                           |        |        |                |      |
| Private                | 1%                              | 4%                            |        |        |                |      |

Notes: Percentages do not always sum to 100 due to rounding.

*Statistical tests are from linear or logistic regressions, adjusting for age (except for age itself, which is a t-test).
*Education measured on a 9-point scale with 3 = completed elementary school, 5 = completed high school.
*Income measured on a 5-point scale with 2 = below $1000 per month, 3 = between $1000 and $1999 per month.
*Categories are not mutually exclusive so may sum to more than 100%.
*Statistical test is West Zone vs. other.
*Statistical test is single vs. married/other.
*Statistical test is insured vs. not.
returning to the NGO for their test results and posttest counseling. Given that participants who had referred other men to the study could collect an incentive when they returned to the testing site, the proportion of participants in our study who received their results could potentially have been even lower in the absence of the incentive. Although none of the participants expressly refused to get their test results, a few said they did not have time or that they would return later, which may have been subterfuges to avoid learning of the results. The failure by many participants to receive HIV test results supports the benefit of using rapid HIV testing so that results can be delivered in the same session (Bala´n et al., 2011). Currently, rapid HIV tests that can provide results in about 20 minutes are not widely used in Buenos Aires where typically people must wait several days for their test results. Rapid HIV tests should be made available in Buenos Aires promptly.

Finally, the association of lack of prior HIV testing with sociodemographic indicators of social marginalization (lower education and income, unemployment, no health insurance, and fewer social connections) indicates an urgent need to promote and facilitate HIV testing among the most disenfranchised sectors of the greater Buenos Aires population.

This study has several limitations. Except for laboratory results, all our data consist of self-reports. Thus, they are subject to inaccuracy due to poor recall and voluntary or involuntary distortion. Furthermore, RDS can perform poorly when traits cluster in cohesive subpopulations, a phenomenon that may be especially acute in the case of infectious diseases (Goel & Salganik, 2010). Our sampling procedure largely failed to attract volunteers from the north (more affluent) zone of Buenos Aires, which is consequently underrepresented in these results. This may be a result of bottlenecks in the network structure of the population (Goel & Salganik, 2009, 2010). Yet, within these constraints the results of this investigation with a diverse sample of 500 MSM provide guidelines for orienting HIV testing efforts that could counteract further spread of the epidemic.

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