

## A Preliminary Profile of HIV Risk in a Clinic-Based Sample of MSM in Puerto Rico: Implications for Sexual Health Promotion Interventions

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**Objective:** Puerto Rico has one of the fastest growing HIV epidemics in the United States and - consistent with patterns observed in the Caribbean region as a whole - data on new infections shows the increased influence of sexual transmission in the local epidemic. Historically, both epidemiology and prevention activities have focused primarily on the islands' large heroin injector population. Although the available surveillance data indicate high rates of STIs and HIV among men who have sex with men (MSM), there has been little social and behavioral research among MSM and hence little empirical information to inform intervention development and planning.

**Methods:** Given the absence of data on MSM and their importance in the emerging epidemic on the island, this paper describes a sample of MSM patients in an STI/HIV treatment center in the San Juan metropolitan area between October 2009 and June 2011 (n=120). Assessment of sexual risk includes measures of onset of oral, vaginal, and anal sex, as well as current sexual practices and partner characteristics. Self-reported history of STI diagnoses and current HIV status are described.

**Results:** Overall, MSM evidenced relatively large numbers of multiple, concurrent sexual partners, substantial age-discordance among partners, and limited condom use. Relative to HIV-negative MSM, HIV-positive MSM have had more cumulative male sexual partners in anal intercourse (p=0.005). HIV-negative MSM were more likely to have had sex without a condom at last receptive anal intercourse (p=0.012) as well as at last insertive anal sex intercourse (p=0.001).

**Conclusion:** Priorities for advancing HIV interventions for MSM are delineated, including the need for targeted sexual health interventions, mental health services, and improved strategies for engaging and retaining MSM in health services. [*P R Health Sci J* 2012;3:154-160]

*Key words:* HIV, MSM, Puerto Rico, Sexual health

Puerto Rico (PR) has one of the highest HIV incidence rates in the U.S. (45.0 per 100,000), twice that of the overall U.S. population and nearly double that of overall U.S. Hispanic population (1, 2). Although the early HIV epidemic in PR was principally driven by injection-mediated transmission, data on new infections shows the increased influence of sexual transmission in the local epidemic - consistent with patterns observed in the Caribbean region as a whole-, including escalating rates among men who have sex with men (MSM) (3, 4). Substantive increases in sexually transmitted infections (STI) have also been observed among MSM in PR, notably ulcerative STI such as syphilis that are known to have a synergistic impact on HIV transmission risk (5, 6).

Despite the importance of MSM in the emerging HIV epidemic in PR most of the available epidemiological research has focused on injection risk and there is a remarkable absence

of detailed epidemiological information about the MSM population. With a few notable exceptions (3, 7, 8, 9, 10, 11), there is little information available about sexual practices and partnering of MSM in PR, or contact and engagement in prevention services in this group. Similarly there is no information about STI screening and treatment among MSM, nor about HIV testing, enrollment in antiretroviral therapy, and

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*The authors have no conflict of interest to disclose.*

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treatment compliance. Similar limitations in both epidemiology and targeted prevention exist for MSM populations throughout the Caribbean region.

In an effort to begin to redress these gaps in the available epidemiological information about MSM in PR, the objective of this paper is to use data derived from an ongoing clinic-based study as the basis for developing a preliminary epidemiological description of behavioral risk and to identify priorities for sexual health promotion. Since half of the currently sexually active MSM in the sample are living with HIV, and with the goal of informing both primary and secondary prevention needs, the paper is structured as a comparison between these two subgroups.

## Methods

In 2007, researchers from the School of Public Health at the University of PR initiated a strategic research collaboration with the clinical staff of Centro Latinoamericano de Enfermedades de Transmisión Sexual (CLETS), one of the largest publicly funded centers for STI/HIV screening and treatment in the San Juan metropolitan area. The study design and data collection procedures have been detailed elsewhere (12). Briefly, the design involves random selection of subjects from the patient waiting room, a brief screening to assess eligibility, written informed consent, and participation in a face-to-face computer-assisted behavioral risk survey interview.

The interview is divided into four sections: The first section, sociodemographic characteristics, includes questions on date of birth, education, sources of income, sexual self-concept and identification, history of incarceration, military services, and history of suicide. Section 2 includes a detailed assessment of drug use, including lifetime exposure to a broad range of substances, the year that the individual first used the substance, age at first injection, use of drugs in the 90 days prior to the interview, and injection in the past 90 days. Section 3 involves an assessment of sexual risk included onset of oral, vaginal, and anal sex, sexual practices and partners in the last 90 days, experience in buying or selling sex, participation on group sex in the last year, and details of the individual last sexual contact (13). The fourth and final section includes questions about health history and utilization of health services, including the subjects' purpose for visiting the clinic, self-reported history of STI, Hepatitis B Vaccination, and circumcision status. Additionally, selected clinical data are recovered from the patient's medical files, including current STI and HIV status, HIV treatment status, and indicators of HIV disease (including CD4 and viral load tests).

Frequency distributions and summary measures are used to describe the study sample. Univariate relationships between sexual practices and participants' HIV status were assessed using chi-square tests and t tests. Median values for lifetime measures and mode values for measures of current practices (last

90 days) were used as cut-offs to compare numbers of partners and number of events and to support comparisons between HIV-negative and HIV-positive MSM. All statistical analyses were performed using SPSS version 20.

Study participation was voluntary and included written informed consent. Participants received a small interview fee (\$5.00) in compensation for their time in participating in the interview. Study procedures were approved by the Human Research Subjects Protection Office of the University of Puerto Rico - Medical Sciences Campus.

## Results

As of June 2011, a total of 626 male clinic patients have participated in the study. Almost a third (29.2%, n=183) have had sexual contact with another male in their lifetime and within this group, roughly two-thirds (65.6%, n = 120) have had sexual contact with a male partner within the last 90 days. Since the primary objective of this paper is to profile current sexual risk among HIV+ and HIV- MSM, the following analysis is limited to men who reported current sexual activity with a male partner within the last 90 days (n=120).

### Sociodemographic characteristics

As included in Table 1, mean age of the sample is 34.2 years (SD=11.3, Range =17-63) with most (52.5%) being older than 30 years. Overall, the majority (87.5%) of MSM report having been born in PR and most (85.8%) are residing in the San Juan metropolitan area. Nearly a third (28.3%) are students. Three-quarters (79.3%) have attended college and 35.0% have at least a Bachelor's degree. About two thirds (65.0%) have at least part time employment. Nearly half (40.8%) are living alone, a third (33.3%) with their family, 13.3% with a sex partner, and 11.7% with a non-family, non-sex partner roommate.

Almost all (95.0%) described their gender as male, with four participants identifying as female and three as transgender. More than half (63.3%) describe themselves as exclusively attracted to men, 21.7% are primarily attracted to men but sometimes to women, 10.0% are equally attracted to men and women, and 5.0% are primarily or exclusively attracted to women. 75.6% describe themselves as homosexual or "Gay," and 21.8% as bisexual.

HIV-positive MSM are significantly older (mean age = 39.9 years) than HIV-negative MSM (mean age = 27.9 years; p-value = <0.001).

### Lifetime and current use of tobacco, alcohol, and other drugs

As shown in Table 2, almost two-thirds (63.3%) have used tobacco in their lifetime. Among those who have ever used tobacco, two-thirds (71.9%) are current tobacco users (defined as within the last 90 days). Similarly, most (92.5%) have used alcohol in their lifetime and most of these (82.0%) are current

alcohol users. Lifetime exposure to a wide range of illicit or illegal drugs is relatively high (55.0%), including cannabis (48.3%), nitrate inhalants (40.8%), cocaine (28.3%), heroin (7.6%), methamphetamine (5.8%), and one or more types of club drugs including Hydroxybutyric acid (GHB), Ketamine, and 3,4-methylenedioxy-N-methylamphetamine (MDMA) (9.2%). 15.2% have a prior history of injection drug use.

**Table 1.** Sociodemographic characteristics of a sample of men Who Have Sex with Men (MSM) in Puerto Rico by HIV serostatus (n=120)

Characteristics	All MSM n (%)	HIV+ MSM n (%)	HIV- MSM n (%)	p-value
Age (mean, SD)	34.2 (11.3)	39.9 (9.6)	27.9 (9.6)	<0.001*
Education				
<High School	26 (21.7)	12 (19.0)	14 (24.6)	0.464
>High School	94 (78.3)	51 (81.0)	43 (75.4)	
Employment				
At least part-time	78 (65.0)	42 (66.7)	36 (63.2)	0.687
Unemployed (Excluding students)	20 (16.7)	14 (22.2)	6 (10.5)	0.086**
Annual Income				0.064**
None	20 (16.8)	9 (14.3)	11 (19.6)	
< \$20,000	68 (57.1)	32 (50.8)	36 (64.3)	
≥ \$20,000	31 (26.1)	22 (34.9)	9 (16.1)	
Area of residence				
San Juan				
Metropolitan Area	103 (85.8)	50 (79.4)	53 (93.0)	0.033*
Non-San Juan				
Metropolitan Area	17 (14.2)	13 (20.6)	4 (7.0)	
Sexual identity				
Homosexual or gay	90 (75.6)	48 (77.4)	42 (73.7)	0.635

\*Significant at p<0.05; \*\*Significant at p<0.10

Levels of current drug use are considerably lower, including marijuana (39.7%), nitrate inhalants (38.8%), and cocaine (14.7%). However, among those MSM who have ever used an illicit drug, 40.9% have used at least one illicit drug during the last 90 days.

HIV-positive MSM have higher prevalence of lifetime illicit drug use (excluding marijuana) than HIV-negative MSM (68.3% vs. 40.4%, p=0.002), but did not significantly differed in relation to current drug use.

**Selected mental health and clinical indicators**

Overall, nearly a quarter (22.2%) of the MSM had one or more suicide attempts in their lifetime, and nearly half of these (45%) had multiple attempts (see Table 3). Two-thirds (61.7%) self-report diagnosis with one or more STI (excluding HIV), including Syphilis (33.3%), Gonorrhea (19.2%), Herpes (17.5%), Genital Warts (16.8%), Chlamydia (7.6%), Hepatitis B (6.7%), and Hepatitis C (5.9%). A large proportion (43.3%) has had two or more STI diagnoses. Only a third of these men (38.5%) are circumcised. Only half (52.5%) could confirm being vaccinated against Hepatitis B.

**Table 2.** Lifetime and current (Last 90 days) tobacco, alcohol, and illicit drug use among a sample of MSM in Puerto Rico by HIV serostatus (n=120)

Practices	All MSM n (%)	HIV+ MSM n (%)	HIV- MSM n (%)	p-value
<i>Drug use</i>				
<i>Lifetime use of tobacco, alcohol and other illicit/illegal drugs</i>				
Tobacco	57 (63.3)	33 (63.5)	24 (63.2)	0.976
Alcohol	111 (92.5)	58 (92.1)	53 (93.0)	0.849
At least one illicit/Illegal drug (excluding marijuana)	66 (55.0)	43 (68.3)	23 (40.4)	0.002*
Injecting drug use	10 (15.2)	6 (14.0)	4 (17.4)	0.711
<i>Current use of tobacco, alcohol and other illicit/illegal drugs (&lt;90 days)</i>				
Tobacco	41 (71.9)	24 (72.7)	17 (70.8)	0.875
Alcohol	91 (82.0)	45 (77.6)	46 (86.8)	0.207
Used one or more least one Illicit/Illegal drug (excluding marijuana)	27 (40.9)	16 (37.2)	11 (47.8)	0.403
Injected illicit drug	2 (20.0)	2 (33.3)	0 (-)	--

\*Significant at p<0.05

**Table 3.** Self-reported mental health and clinical indicators among a sample of MSM in Puerto Rico by HIV serostatus (n=120)

Indicators	All MSM n (%)	HIV+ MSM n (%)	HIV- MSM n (%)	p-value
<i>History of suicide attempts</i>				
At least one suicide attempt	20 (22.2)	13 (25.0)	7 (18.4)	0.458
Age at first suicide attempt (mean, SD)	28.8 (12.4)	30.3 (12.6)	25.9 (12.6)	0.461
Multiple suicide attempts	9 (45.0)	7 (53.8)	2 (28.6)	0.287
<i>History of STI</i>				
Syphilis	40 (33.3)	24 (38.1)	16 (28.1)	0.245
Gonorrhea	23 (19.2)	12 (19.0)	11 (19.3)	0.972
Herpes	21 (17.5)	16 (25.4)	5 (8.8)	0.017**
Warts	20 (16.8)	12 (19.0)	8 (14.3)	0.488
Chlamydia	9 (7.6)	4 (6.3)	5 (8.9)	0.597
HBV	8 (6.7)	6 (9.5)	2 (3.6)	0.213
HCV	7 (5.9)	5 (7.9)	2 (3.6)	0.325
At least one STI (not HIV)	74 (61.7)	42 (66.7)	32 (56.1)	0.236
Two or more STI	52 (43.3)	42 (66.7)	10 (17.5)	<0.001*
Circumcised	45 (38.5)	28 (46.7)	17 (29.8)	0.061**
HBV vaccination	63 (52.5)	28 (44.4)	35 (61.4)	0.063**
HIV treatment	63 (52.5)	49 (77.8)	--	--

\*Significant at p<0.05

\*\*Significant at p<0.10

HIV-positive MSM are significantly more likely than HIV-negative MSM to have had multiple STI diagnoses (p <0.001) and

a previous diagnosis of Herpes ( $p=0.017$ ). Consistent with the fact that the clinic where the sample was drawn is also a primary center for HIV care, nearly half of the MSM (52.5%) are living with HIV infection. Most of these are enrolled in antiretroviral therapy treatment (77.8%). However, consistent with patterns observed in other high risk groups in the study, (14) MSM initiate care at a relatively late stage in the course of HIV disease. In a preliminary analysis of data recovered from chart review, mean CD4 among newly diagnosed HIV+ MSM was 425 cells/mm<sup>3</sup> (SD=209; Range: 193-806) and mean viral load was 6,947 copies/ml (SD=11,047; Range: 294-28,805), both indicative of substantial immune impairment at time of treatment enrollment.

**Onset of sex**

Mean age of first oral sex with a male partner was 17.4 years (SD=4.8, Range 10-41). Half the sample (49.5%) had more than 10 male oral sex partners in their lifetime (see Table 4). Mean age of first anal intercourse with a male partner was 18.9 years (SD=5.3, Range 10-41). More than a third (36.7%) had more than 10 anal sex partners in their lifetime. Almost half (47.5%) had sex with a female partner in their lifetime, with a mean age of 18.2 years (SD=5.1, Range 11-40) at first penetrative sex with a female partner. However, only 5.0% had sex with a female partner within the last 90 days (see Table 5).

HIV-positive MSM have had more male sexual partners in anal intercourse ( $p=0.005$ ) and more likely had a female partner in their lifetime ( $p=0.063$ ). HIV-negative MSM had an earlier onset (Mean age=15.2 years) of penetrative sex with a female partner ( $p<0.001$ ).

**Table 4.** Onset and cumulative sexual risk among a sample of MSM in Puerto Rico by HIV serostatus (n=120)

	All MSM n (%)	HIV+ MSM n (%)	HIV- MSM n (%)	p-value
<i>Lifetime Sex with Men</i>				
Age at first oral sex	Mean = 17.4, SD = 4.8, Range = [10,41]	17.8 (4.9)	17.0 (4.8)	0.428
Number of oral sex partners	More than 10 Partners: 55 (49.5)	35 (60.3)	20 (37.7)	0.017*
Age at first anal sex	Mean = 18.9, SD = 5.3, Range = [10,41]	19.1 (5.2)	18.7 (5.5)	0.671
Number of anal sex partners	More than 10 Partners: 40 (36.7)	28 (49.1)	12 (23.1)	0.005*
<i>Lifetime Sex with Women</i>				
Oral, vaginal or anal sex	57 (47.5)	35 (55.6)	22 (38.6)	0.063**
Age at first penetrative sex	Mean=18.2, SD=5.0, Range = [11,40]	19.9 (5.4)	15.2 (2.0)	<0.001*

\*Significant at  $p<0.05$ ; \*\*Significant at  $p<0.10$

**Table 5.** Current (Last 90 days) sexual practices and partners among a sample of MSM in Puerto Rico by HIV serostatus (n=120)

	All MSM n (%)	HIV+ MSM n (%)	HIV- MSM n (%)	p-value
<i>Oral Sex</i>				
Frequency of performing oral sex	More than 9 Events: 32 (29.1)	19 (33.3)	13 (24.5)	0.310
Frequency of receiving oral sex	More than 9 Events: 36 (35.0)	17 (31.5)	19 (38.8)	0.438
<i>Anal Intercourse</i>				
Frequency of anal intercourse	More than 8 Events: 26 (24.8)	14 (27.5)	12 (22.2)	0.535
Frequency of RAI	More than 6 Events: 18 (22.8)	10 (23.3)	8 (22.2)	0.913
Numbers of partners in RAI	More than 2 Events: 17 (22.4)	11 (25.6)	6 (18.2)	0.443
Frequency of IAI	More than 6 Events: 27 (32.9)	14 (35.9)	13 (30.2)	0.586
Numbers of partners in IAI	More than 2 Events: 15 (18.5)	8 (21.1)	7 (16.3)	0.581
Oral, vaginal or anal sex with female partner	6 (5.0)	2 (3.2)	4 (7.0)	0.347

\*Significant at  $p<0.05$ ; \*\*Significant at  $p<0.10$

**Current sexual practices (Last 90 days)**

Overall, MSM evidence relatively large numbers of multiple, concurrent sex partners, substantial age-discordance, and limited condom use. As included in Table 5, within the last 90 days, 29.1% performed oral sex on a male partner on 9 or more occasions and 35.0% received oral sex from a male partner on 9 or more occasions during the same interval. Nearly a quarter (22.8%) engaged in more than 6 receptive anal intercourse (RAI) events within the last 90 days and a third (32.9%) engaged in more than 6 insertive anal intercourse (IAI) events in this interval. In the overall 90 days measures, no significant differences were found by HIV status.

**Last sexual intercourse**

At last RAI, nearly half of the exchanges (47.4%) involved a primary partner, 35.5% were with a casual (repeat) partner, and 17.1% with a new partner (See Table 6). Over half (54.0%) of the last RAI exchanges involved an age-discordant partner ( $\pm 5$  years). More than one quarter of the exchanges involved receptive penetration (27.8%) without a condom, including receipt of ejaculation without a condom (45.5%) or withdraw of the penis before ejaculation (54.4%). At last RAI, HIV-negative MSM were less likely than HIV-positive MSM to use a condom (41.7% vs. 16.3%,  $p=0.012$ ) and HIV-positive MSM were more likely than HIV-negative MSM to have engaged in receptive penetration with a condom (81.4% vs. 58.3%,  $p = 0.025$ ).

**Table 6.** Sexual practices at last sexual encounter among a sample of MSM in Puerto Rico by HIV serostatus (n=120)

	All MSM n (%)	HIV+ MSM n (%)	HIV- MSM n (%)	p-value
<b>Last RAI</b>	79 (65.8)	43 (68.3)	36 (63.2)	0.557
Repeat primary sex partner	36 (47.4)	16 (38.1)	20 (58.8)	0.114
Repeat casual partner	27 (35.5)	16 (38.1)	11 (32.4)	0.114
New partner	13 (17.1)	10 (23.8)	3 (8.8)	0.114
Age discordance (± 5 years)	41 (54.0)	25 (59.5)	16 (47.1)	0.278
Receptive penetration without condom	22 (27.8)	7 (16.3)	15 (41.7)	0.012
Receipt of ejaculation without condom	10 (45.5)	2 (28.6)	8 (53.3)	0.286
Receptive penetration with condom	56 (70.9)	35 (81.4)	21 (58.3)	0.025*
Receipt of ejaculation with condom	30 (53.6)	15 (42.9)	15 (71.4)	0.038*
Partner withdrew before ejaculation	43 (54.4)	25 (58.1)	18 (50.0)	0.469
<b>Last IAI</b>	82 (68.3)	39 (61.9)	43 (75.4)	0.111
Repeat primary sex partner	34 (50.0)	14 (43.8)	20 (55.6)	0.598
Repeat casual partner	20 (29.4)	11 (34.4)	9 (25.0)	0.598
New partner	14 (20.6)	7 (21.8)	7 (19.4)	0.598
Age discordance (± 5 years)	35 (51.5)	20 (62.5)	15 (41.7)	0.086**
Insertive penetration without a condom	33 (40.2)	8 (20.5)	25 (58.1)	0.001*
Insertive ejaculation without a condom	17 (51.5)	3 (37.5)	14 (56.0)	0.367
Insertive penetration with a condom	52 (63.4)	31 (79.5)	21 (48.8)	0.004*
Insertive ejaculation with a condom	25 (48.1)	15 (48.4)	10 (47.6)	0.957
Withdraw before ejaculation	44 (53.7)	21 (53.8)	23 (53.5)	0.974

\*Significant at p<0.05; \*\*Significant at p<0.10

At last exchange involving IAI, half (50.0%) involved a primary partner, 29.4% involved a causal (repeat) partner, and roughly one fifth were with a new partner (20.6%). Half (51.5%) involved exchanges with an age discordant partners (± 5 years). At last IAI, 40.2% of the exchanges involved insertive penetration without a condom, including insertive ejaculation without a condom (51.5%) and withdraw of the penis before ejaculation (53.7%). At last IAI, HIV-negative MSM were more likely to have engaged in insertive penetration without a condom (58.1% vs. 20.5%, p = 0.001), and HIV-positive MSM

were more likely to have engaged in insertive penetration with a condom (79.5% vs. 48.8%, p = 0.004).

## Discussion

The data are limited to MSM recruited from a clinic environment, notably one that may be expected to select for high risk individuals. Consequently, the findings may not be generalizable to the overall MSM population in PR. Moreover, the measures of sexual risk that were employed were intended for use in a general clinic sample and may not adequately capture the complexity of sexual practices of MSM. Similarly, the modest sample size limits the types of analysis that can be advanced at this time. For example, some differences between HIV-positive and HIV-negative MSM may be an artifact of the significant differences in age between these two groups but we are unable to assess this question in the current sample. Similarly, we note that 21.8% of the sample self-identified as bisexual. However, the current sample does not include a sufficient number of subjects to support independent analysis of this subgroup. There is a growing body of literature which shows that gender identity, sexual identity, and sexual self-concept can have important implications for sexual roles and partnering and additional research on these issues is needed. Lastly, our data is cross-sectional and consequently we cannot assess the way in which sexual risk practices of MSM in PR have changed over time, including for example, whether or not behavioral risks among MSM are increasing or decreasing.

These limitations notwithstanding, the data support the following preliminary observations about sexual risk among MSM in PR: First, even allowing for the fact that the sample was recruited in an STI clinic, MSM in this sample have an extraordinarily high rate of lifetime diagnosis with STI. Second, sexual profiles of MSM include high rates of multiple, concurrent partners (including both new and repeat partners) as well as substantial age cohort mixing. Third, MSM have relatively high rates of current sex with female partners, suggesting potential for epidemiological bridging between MSM and female partner sexual networks. Fourth, substantial levels of sexual transmission risk remain among both HIV-positive and HIV-negative MSM. For example, at last anal intercourse with a male partner, MSM had relatively high rates of unprotected anal penetration, limited condom use, and high rates of semen exchange. HIV-negative MSM have higher rates of unprotected semen exchange in both RAI and IAI compared to HIV-positive MSM. These behavioral patterns contribute to new infections and suggest the potential for a self-sustaining HIV epidemic among MSM in PR.

The data highlight the critical need for both primary and secondary prevention programming for MSM populations in PR. The following recommendations may be considered: MSM

evidenced relatively high rates of oral sex as well as relatively high rates of multiple concurrent partners, a pattern that facilitates diffusion of some types of STI (consistent with the high rates of self-reported STI history evidenced in this sample). Noteworthy is the fact that two of the key STI, HPV and HBV, are preventable by vaccination. Yet MSM evidence low rates of vaccination. Targeted interventions are needed to engage and retain MSM in vaccination programs.

Interventions are needed to engage and retain MSM in preventative health services, including routinization of HIV screening. It may be expected that effective engagement in health services would contribute to earlier detection, more timely engagement in HIV treatment, and reduced risk of secondary transmission. In this context, it should be emphasized that substantial thought must be given as to how to effectively engage younger MSM cohorts, many of whom are sexually active with both men and women, and who may not be accessible using identity-based service delivery models. Targeted interventions are also needed for MSM living with HIV in order to improve engagement and retention in HIV care and to reduce secondary infection in their sexual networks.

MSM have high rates of suicide, including substantial rates of multiple attempts, a fact that may reflect high levels of untreated mental health distress. High rates of anxiety, depression, and suicidality may contribute to sexual risk and may also contribute to poor health outcomes among HIV+ MSM (e.g., poor ART treatment compliance, etc.). Increased attention to mental health programming for MSM is needed.

Beyond these specific issues, there is a more fundamental need to reconsider existing approaches to HIV prevention for MSM in PR, most of which are limited to relatively generic testing and counseling programming. MSM in PR are not unique in evidencing substantial rates of behavioral risk. Similar behavioral patterns have been observed in other MSM populations in the US (15, 16), particularly among ethnic and racial minority MSM (17). In reflecting upon the persistence of behavioral risk among MSM populations, a number of recent review articles (18) have suggested that part of the problem may lie in the fact that most behavioral interventions for MSM have been conceptualized within a disease-containment model and largely absent the kind of holistic sexual health promotion programming that is increasingly recognized to be required in order to foster and sustain sexual health. For example, while increasing HIV testing is a necessary and important component to any health promotion program, in and of itself it does not advance sexual health. Yet conventional HIV testing and counseling remains the primary HIV interventions available to MSM in PR. Both behavioral and ecological interventions are needed to promote comprehensive sexual health among MSM in PR and thereby reduce underlying determinants of poor health outcomes in this group. Noteworthy in this socio-cultural context is the fact that MSM face substantial risk for

stigma and discrimination, particularly in health care settings. Health services interventions are needed that will change the nature of the health services environment in order to enhance open communication between MSM and health care providers and to foster improved engagement in care. Such models may be expected to contribute to more timely screening and treatment of STIs and earlier engagement in HIV care among HIV-positive MSM. This latter goal is particularly important for reducing secondary HIV infection, a noteworthy outcome given escalating HIV incidence rates.

## Resumen

**Objetivo:** Puerto Rico tiene una de las epidemias de VIH de mayor crecimiento en EE.UU., y consistente con los patrones observados en la región del Caribe, datos de nuevas infecciones evidencian un incremento en la influencia de la transmisión sexual en la epidemia local. La prevención y la epidemiología se han enfocado en los usuarios de drogas intravenosas. Aunque datos de vigilancia señalan altas tasas de VIH e ITS en hombres que tienen sexo con hombres (HSH), existe limitada investigación sobre características sociales y de comportamientos y por consiguiente poca información empírica para el desarrollo y planificación de intervenciones. **Métodos:** Basado en la ausencia de datos sobre HSH y su importancia para la epidemia en PR, este escrito describe una muestra de pacientes HSH de un centro para tratamiento de VIH/ITS en el área metropolitana de San Juan, entre octubre de 2009 y junio de 2011 (n=120). La evaluación de comportamientos sexuales de riesgo incluye medidas de inicio de prácticas sexuales orales, vaginales y anales, prácticas sexuales al presente y características de las parejas sexuales. Se describe el historial de diagnósticos de ITS y estado de VIH. **Resultados:** Los HSH evidenciaron números relativamente altos de parejas sexuales simultáneas, diferencias de edad sustanciales entre las parejas y uso limitado de condón. Los HSH VIH-positivos han tenido más parejas sexuales para sexo anal ( $p=0.005$ ). Los VIH-negativos tendieron más a no utilizar condón en el último evento de sexo anal receptivo ( $p=0.012$ ) y de sexo anal insertivo ( $p=0.001$ ). **Conclusión:** Prioridades para intervenciones de VIH, incluyen intervenciones de salud sexual y de salud mental, y mejores estrategias para involucrar y retener HSH en cuidado de salud.

## Acknowledgments

We wish to thank the men who agreed to participate in the study. Additionally, we thank the UPR undergraduate and graduate students who assisted in data collection. Finally, we wish to extend our gratitude to the clinical staff at Centro Latinoamericano de Enfermedades de Transmisión Sexual (CLETS) for their assistance in facilitating the data collection.

## References

- Centers for Disease Control and Prevention. Estimated lifetime risk for diagnosis of HIV infection among Hispanic/Latino – 37 States and Puerto Rico, 2007. *MMWR Morb Mortal Wkly Rep* 2010;59:1297-1301.
- Centers for Disease Control and Prevention. Incidence and diagnoses of HIV Infection – Puerto Rico. *MMWR Morb Mortal Wkly Rep* 2006;58:589-591.
- Colón-López V, Rodríguez-Díaz CE, Ortiz AP, et al. HIV-related risk behaviors among a sample of men who have sex with men in Puerto Rico: An overview of substance use and sexual practices. *PR Health Sci J* 2011;30:65-68.
- Puerto Rico Health Department. People diagnosed and living with HIV/AIDS in Puerto Rico. HIV/AIDS Surveillance System. 2012.
- Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Infect* 1999;75:3-17.
- Puerto Rico Health Department. Sexually transmitted diseases reported by municipality and regions. OCASET Program for STD/HIV/AIDS Prevention: Office of STD Surveillance System. 2011.
- Neumann MS, O'Donnell L, Doval AS, et al. Effectiveness of the VOICES/VOCES sexually transmitted disease/human immunodeficiency virus prevention intervention when administered by health department staff: Does it work in the “real world”? *Sex Transm Dis* 2011;38:133-139.
- Stein R, Green K, Bell K, et al. Provision of HIV counseling and testing services at five community-based organizations among young men of color who have sex with men. *AIDS Behav* 2011;15:743-750.
- Toro-Alfonso J, Varas-Díaz N, Andújar-Bello I. Evaluation of an HIV/AIDS prevention intervention targeting Latino gay men and men who have sex with men in Puerto Rico. *AIDS Educ Prev* 2002;14:445-456.
- Finlinson HA, Colón HM, Robles RR, et al. Sexual identity formation and AIDS prevention: An exploratory study of non-gay-identified Puerto Rican MSM from working class neighborhoods. *AIDS Behav* 2006;10:531-539.
- Finlinson HA, Colón HM, Robles RR, et al. An exploratory study of Puerto Rican MSM drug users: The childhood and early teen years of gay males and transsexual female. *Youth Soc* 2008;39:362-384.
- Clatts MC, Rodríguez-Díaz CE, García H, et al. The use of STI clinics in Puerto Rico as strategic venues for accessing high risk populations for targeted HIV research and intervention. *PR Health Sci J* 2011;30:101-107.
- McMahon JM, Tortu S, Pouget ER, et al. Contextual determinants of condom use among female sex exchangers in East Harlem, NYC: An event analysis. *AIDS Behav* 2006;10:731-741.
- Clatts MC, Rodríguez-Díaz CE, García H, et al. Preliminary evidence of significant gaps in continuity of HIV care among incarcerated populations in Puerto Rico. *J Int Assoc Physicians AIDS Care* 2011;10:339-341.
- Clatts MC, Goldsamt LA, Yi, H. Drug and sexual risk in four men who have sex with men populations: Evidence for sustained HIV epidemic in New York City. *J Urban Health* 2005;82(Suppl 1):i9-i17.
- Lansky A, Brooks JT, DiNenno E, et al. Epidemiology of HIV in the United States. *J Acquir Immune Defic Syndr* 2010;55:S64-S68.
- Centers for Disease Control and Prevention. Prevalence and awareness of HIV infection among men who have sex with men – 21 cities, United States, 2008. *MMWR Morb Mortal Wkly Rep* 2010;59:1201-1207.
- Coleman, E. What is Sexual Health? Articulating a sexual health approach to HIV prevention for men who have sex with men. *AIDS Behav* 2011;15(Suppl 1):S18-24.