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Sexual Behaviors among Adults in Puerto Rico: A Population-Based Study

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Abstract

Introduction—Given changes in sexual behaviors and norms in the United States, there is a need for current and representative data on sexual behaviors with particular interest in gender, age, and racial/ethnic group differences.

Aim—Given the limited data for Hispanics and for Puerto Rico (PR), we described patterns of sexual behaviors and characteristics among a sexually active sample (n = 1,575) of adults aged 21–64 years in PR.

Main Outcome Measures—The main outcome measures for this study are sexual behaviors including age at sexual initiation, number of sexual partners, vaginal and anal intercourse, and oral sex, among others.

Methods—Data from a population-based cross-sectional study in PR (2005–2008) was analyzed. The prevalence of sexual behaviors and characteristics was described by age-group and gender during the lifetime and in the past 12 months.

Results—Overall, 96.8%, 81.6%, and 60.9% of participants had ever engaged in vaginal, oral and anal sex, respectively, whereas 23.7% were seropositive to any of the sexually transmitted infections under study. Sexual initiation ≥ 15 years was reported by 37.8% of men and 21.4% of women; whereas 47.9% of men and 13.2% of women reported to have had ≥ 7 sexual partners in their lifetime. Approximately, 3% of women and 6% of men reported same-sex sexual practices, while history of forced sexual relations was reported by 9.6% of women and 2.5% of men. Sexual initiation ≥ 15 years was more common among individuals aged 21–34 years (41.4% men and 33.6% women) as compared with older cohorts. Although having had ≥ 7 sexual partners over a lifetime among men was similar across age groups, this behavior decreased in older women cohorts. In both genders, the prevalence of oral and anal sex was also lower in the older age cohorts.

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Conclusion—This study provides essential information than can help health professionals understand the sexual practices and needs of the population of PR.

Keywords

Sexuality; Puerto Rico; Hispanics; Sexual Health

Background

Sexual health and responsible sexual behaviors are among the Surgeon General's Public Health Priorities, the Department of Health and Human Services' Healthy People 2010 initiative, the Guide to Community Preventive Services of the United States, and the World Association for Sexual Health [1,2]. Sexual rights, including access to sexual and reproductive healthcare services, sexuality education, respect for bodily integrity, and choice of partners, are a basic component of human rights and are fundamental to the achievement and maintenance of sexual health [2]. Even though sexual behaviors are a fundamental part of human relationships, closely related to physical and mental health [1], high-risk sexual practices can increase the risk of unintended pregnancies, promote violent behavior, and increase the risk of sexually transmitted infections (STIs) [1,3–5]. Studies of sexual health and behavior are of great interest in Puerto Rico (PR), as statistics for this U.S. jurisdiction show high teen pregnancy rates [6,7] and AIDS rates (21.5/100,000) are among the highest of all U.S. states and territories [8,9]. In 2006, the incidence rate of HIV in PR was 45.0 cases per 100,000 population, twice the rate estimated for the United States (22.8/100,000) and 1.5 times the rate for Hispanics in the United States (29.4/100,000) [8]. In addition, the proportion of individuals in PR that are unaware of their HIV and other STIs serostatus is high (98.3% for hepatitis B virus [HBV], 36.4% for HIV, and 97.8% for herpes simplex virus type 2 [HSV-2]) [10].

In the United States, changes in sexual behaviors and norms have occurred in the past decades, partially influenced by the media, Internet, and sexual dysfunction medication, some of which may be related to increased incidence rates of some STIs in the population [11]. The need for current and representative data that describes sexual behaviors in the United States has been recognized, with particular interest in gender, age, and racial/ethnic group differences [11,13], as this will help healthcare professionals understand the sexual health needs of the population and the need of health education/interventions for certain population sub-groups. Although some population-based studies have assessed sexual behaviors across racial/ethnic groups in the United States [12–15], most data in Hispanics has focused primarily on Mexican Americans who may differ from other Hispanic subgroups. Population-based data on the prevalence of sexual practices among Puerto Rican adults are lacking. This information is essential to further characterize sexual practices in this population, the size and characteristics of populations at elevated risk for STIs and other sexuality-related problems, and the recognized need to develop and implement targeted interventions for these populations [16,17]. Thus, this study described, for the first time, patterns of sexual behaviors and characteristics among sexually active adults in PR.

Methods

Study Population

Data were collected as part of the household cross-sectional survey that estimated the prevalence of antibodies to hepatitis C and other viral infections (hepatitis A [HAV], HBV, HIV and HSV-2) in the adult population of PR using a stratified cluster probability sample of households [10,18,19]. The target population comprised non-institutionalized adults residing in PR at the time of the survey. The study population consisted of 1,654 individuals

aged 21–64 years randomly selected, from which, 1,575 individuals (95.2%) reported to have been sexually active in their lifetime and thus were included in the present analysis.

Data Collection

This study was approved by the Institutional Review Board of the Medical Sciences Campus at the University of Puerto Rico. The study data collection methodology has been described in detail elsewhere [10,18,19]. In brief, eligible individuals that agreed to participate were provided with appointments to visit a mobile examination unit located in the vicinity of their homes where they completed the informed consent procedures. Private face-to-face interviews collected standard sociodemographic characteristics plus extensive information on medical history and other health-related habits. An Audio Computer-Assisted Self-Interview (ACASI) was employed to collect sensitive information including sex-related behaviors and drug use practices. Blood samples were also collected and tested for detection of antibodies to HIV, HBV and HSV-2 [10,18]. We modeled our questionnaires after those used in previous Spanish household surveys conducted in PR [18]. Specific questions to assess drug use practices, sex behaviors, and history of sexual abuse were obtained from the questionnaire developed by the Alliance for Research in El Barrio, New York, and Bayamón Project [20]. The overall participation rate of the study was 77.9% [10,18].

Study Variables

Demographic characteristics included gender (male, female), age in years (21–34, 35–49, 50–64), marital status, educational attainment in years, employment status, and annual family income (below poverty level: <\$20,000, at or above the poverty level: \$20,000). Lifetime and past 12-month history of the following sex practices were collected: oral, vaginal, and anal sex; these questions were based on instruments previously used in other surveys in PR [20]. The question that addressed oral sex included mouth/vagina, mouth/penis, and/or mouth/anus contact. The question that addressed anal intercourse among all respondents was the following: *“Have you ever had anal sex, where your partner introduced his penis in your anus?”*; for male respondents, the following question was also asked *“Have you ever had anal sex, where you introduced your penis in the anus of your partner?”*. The number of lifetime sexual partners, number of lifetime male and female sexual partners, and information on age at sexual initiation was also assessed. Other characteristics collected included: lifetime history (yes, no) of forced sexual relations (*unwanted sexual intercourse through the use or threat of physical violence*), history of having sex under the influence of drugs (marijuana, crack, heroin, or cocaine) in the past 12 months; lifetime and past 12-month history of sexual intercourse with an injection drug user and sexual intercourse with a person with a history of STIs; lifetime history of having had sexual intercourse in gatherings where there was a room assigned for sexual encounters, where a person was brought to have sex with guests, in an orgy or as a “swinger”; lifetime use of sex toys (*objects to stimulate your genital zone or anus*); and of history of paid sex (*ever received payment for sex and/or paid for sex*). Positivity (yes/no) to serum antibodies to three STIs for which information was available in the study (HIV, HBV and HSV-2) was also considered in the analyses.

Statistical Analysis

The overall and age- and gender-specific prevalence of sexual behaviors and characteristics were described. Overall prevalence of each sexual practice was weighted to match the age and gender distribution according to the 2000 Census estimated population aged 21–64 years in PR. These weights reflect the probability of participation in each household block and the inverse of the probability of selection according to the households' blocks, gender, and geographic strata [10,18]. Logistic regression models were employed to evaluate the interaction effect of age and gender in the behavior of relevant sexual practices using the likelihood ratio test. The prevalence (lifetime and past 12 months) of each sexual item was

age-adjusted by the direct method based on the 2000 U.S. standard population. To identify significant differences among sexual practices by gender, the standardized rate ratio (SRR) was estimated with 95% confidence interval (CI) [21]. Also, logistic regression models were employed to evaluate the age- and gender-adjusted association of selected sexual practices with positivity to STIs antibodies. Data management and all statistical analyses were performed using the statistical package Stata for Windows release 10 (Statacorp LP, College Station, TX).

Results

Study Population

The study population of this project has been described in detail elsewhere [10,18,19]. Among sexually active adults, 88.3% had been born in PR, more than half (56.3%) were women, 34.4% were aged 21–34 years, 38.7% were aged 35–49 years, and 26.9% were aged 50–64 years. At the time of interview, 59.6% of participants were married or in a consensual union, 75.4% had at least 12 years of education, 65.6% were living below the poverty level (according to the 1999 median family income), and 89.5% had either private or public health insurance coverage. Meanwhile, 81.1% of participants reported sexual activity in the 12 months previous to the interview (data not shown).

Age-Standardized Prevalence of Lifetime Sexual Practices, by Gender

Overall and gender specific lifetime sexual behaviors are described in Table 1. The age-standardized prevalence of having had an age at sexual initiation 15 years was 80% higher among men than women (SRR = 1.8, 95% CI: 1.5–2.1) (Table 1). Similarly, the prevalence of having had 7 sexual partners over a lifetime was fourfold higher among men than women. While approximately 2.6% of women and 5.5% of men reported same-sex sexual encounters, history of both male and female sexual partners was higher among men as compared with women (SRR = 2.3, 95% CI: 1.4–3.9). Overall, 96.8%, 81.6%, and 60.9% of participants had ever engaged in vaginal, oral, and anal sex, respectively; none of these practices differed by gender. Meanwhile, 5.2% of men reported anal intercourse specifically with other men.

In this population, 9.6% of women and 2.5% of men reported forced sexual relations, men being less likely than women to report this behavior (SRR = 0.3, 95% CI: 0.1–0.4). Meanwhile, history of ever having had sexual partners with a history of an STI (SRR = 2.0, 95% CI: 1.4–2.9), of ever having sex in a gathering where there was a room assigned for sexual encounters (SRR = 7.4, 95% CI: 3.7–17.8), or in a gathering where a person was brought to have sex with the guests (SRR = 11.9, 95% CI: 4.5–45.0) was significantly more common among men than women. Although history of ever having sex in an orgy and swinging activities were uncommon sexual practices in this population (<2%), these were also three to four times more common among men than women. History of receiving payment for sex and/or of paying for sex was significantly more common among men than among women (SRR = 28.5, 95% CI: 14.3–71.7), while men were 70% less likely to report lifetime use of sex toys as compared with women (SRR = 0.3, 95% CI: 0.2–0.4).

Age-Standardized Prevalence of Selected Sexual Practices in the Past 12 Months, by Gender

Several sexual behaviors were also assessed during the 12 months preceding the interview (Table 2). No differences were observed in the prevalence of vaginal, oral, or anal sexual practices by gender. Among high-risk sexual practices, almost fourfold more men than women reported to have engaged in sexual encounters under the influence of drugs in the preceding 12 months (SRR = 3.9, 95% CI: 2.7, 5.7). Meanwhile, less than 3% of persons

indicated to have ever had a sexual partner with a history of an STI or who had ever injected drugs; these practices did not vary by gender.

Lifetime Sexual Practices, by Age and Gender

Prevalence of various sexual behaviors differed significantly ($P < 0.05$) by age, in both men and women (Table 3). Age at sexual initiation 15 years was significantly more common among individuals aged 21–34 years (41.4% men and 33.6% women) as compared with their counterparts aged 35–49 years and 50–64 years. These gender differences persisted after persons who had ever been forced to have sex were excluded from the analysis (data not shown). Although the prevalence of having had 7 sexual partners over a lifetime among men was similar across the three age groups (46–53%) ($P > 0.05$), this behavior decreased in older women cohorts ($P < 0.0001$). Significant ($P < 0.01$) age and gender differences in the prevalence of oral sex were also observed; in both men and women this practice was lower in the older age cohorts, and was more common in men than women (except in the youngest age cohort). History of both male and female sexual partners also differed by gender and age ($P < 0.05$), increasing from 3.3% in men aged 21–34 years to 8.1% in those aged 50–64 years; however, an opposite, decreasing pattern was observed among women. A similar pattern was also seen for history of sexual partners who had ever injected drugs; in older cohorts, the prevalence was higher among men and lower among women.

Although no significant interactions were seen in the prevalence of other sexual risk behaviors by gender and age, interesting patterns were observed. For instance, the prevalence of history of anal intercourse was lower in older cohorts while the history of forced sexual intercourse was more common in younger cohorts. In all age groups, participation in group activities where sex was involved (gatherings, orgies, or swinging activities) was much more common among men than among women; while significant age differences were observed only among men ($P = 0.003$). In both men and women, the prevalence of paying/received payment for sex differed by age ($P < 0.05$); in women, the practice was more common in those aged 21–34 years (1.7%), whereas in men, it was more common among those aged 50–64 years (30.2%). Finally, in both genders, the use of sex toys was more common among the youngest age group (7.2% men and 25.4% women), as compared with older cohorts.

Age-Specific Prevalence of Selected Sexual Practices in the Past 12 Months, by Gender

Among participants, various sexual behaviors also differed significantly ($P < 0.05$) by age, in both men and women (Table 4). In both men and women, the prevalence of vaginal intercourse was significantly lower ($P < 0.0001$) in older cohorts, decreasing from 86.4% in men aged 21–34 years to 68.9% in men aged 50–64 years and from 94.9% in women aged 21–34 years to 46.3% in women aged 50–64 years. Meanwhile, in both men and women, the prevalence of oral and anal sexual activities 12 months previous to the interview also decreased with age, with lower prevalence observed in persons from older cohorts. Although sex under the influence of drugs was a practice reported in the past 12 months by participants of all age groups, these were most common in the youngest age cohort (26.0% of men and 6.9% of women aged 21–34 years).

Prevalence of STIs in Relation to Behavioral Risk Factors

Overall, 374 (23.7%) of study participants were seropositive to any of the STIs under study. The specific prevalence of seropositivity was 0.57% for HIV, 22.5% for HSV-2 and 3.4% for HBV (data not shown). Table 5 shows the age- and gender-adjusted prevalence odds ratio for selected STIs according to sexual practices. Significantly higher odds of STIs were observed for early age at sexual initiation, increased number of sexual partners and history of anal sex. In addition, persons who engaged in sex with both men and women, those who

engaged in sex under the influence of drugs, and those who had a sexual partner with a history of injection drug use had increased odds of STIs. Sex receiving payment and/or paying for sex also increased the odds of STI seropositivity. Persons with history of having sex in activities/gatherings where sex was involved and those who had a sexual partner with a history of an STI were more likely to be positive for STI antibodies, although these results were marginally significant ($P = 0.06$).

Discussion

This is the first population-based study that describes multiple sexual behaviors and characteristics among a representative sample of adults aged 21–64 years in PR. The higher proportion of men as compared with women that report an early age at sexual initiation (15 years) and the inverse relation between this practice and age is consistent with studies in the United States [13]. The prevalence of early age at sexual initiation is much higher in men (37.8%) and women (21.4%) in PR as compared with adults aged 20–59 years in the United States (men, 19.0%; women, 12.3%). In addition, the prevalence of sexual initiation 15 years is approximately twofold higher in PR than that of non-Hispanic Whites (NHW) and Hispanics and comparable to data from non-Hispanic Blacks (NHB) in the United States (men, 36.9%; women, 19.2%) [13]. This result is of relevance as early age of sexual initiation was positively associated with STIs in our study, an association that is well established in the scientific literature [22], and that may partially explain the high burden of STIs in PR, including HIV and HSV-2 [7,10].

The percentage of men in our study who reported 7 lifetime sexual partners (47.8%) is similar to what has been reported in U.S. men aged 20–59 years (50%), although higher than estimates for Mexican American men (38%). In contrast, the percentage of women in PR who reported this behavior (13.2%) was lower than that of U.S. women (31%), although similar to data from Mexican Americans [13]. Also, consistent with studies in the United States and in other Hispanic populations is the observation that men have more sexual partners than women [13, 23, 24], and that younger women have a higher prevalence of multiple sexual partners than older women [13]. This pattern is consistent with a study of adolescents in PR where the prevalence of sexual relations with intercourse was similar in both sexes, which contrasts with what has been traditionally reported and still prevails in many other countries (higher prevalence of early age at sexual initiation among men than women). However, it parallels recent studies that demonstrate that gender differences in sexual practices are vanishing and could represent a future trend [25].

Anal intercourse appears to be more common in PR than in the United States. The prevalence of lifetime anal sex among men and women in our study sample (64.4% in men and 57.1% in women) was twice the prevalence reported by the 2002–2003 National Survey of Family Growth [26] for men (34.0%) and women (30.0%) aged 15–44 years. A similar pattern was observed when our data are contrasted to those for Hispanic, NHW, and NHB men and women in the United States. Meanwhile, a twofold higher prevalence of anal intercourse as compared with the United States was still observed in our study when we limited our analysis to men and women aged 21–44 years (64% women, 69% men). The lifetime prevalence of oral sex in men (83%) and women (77%) was similar to that reported for men (83%) and women (82%) aged 15–44 years in the United States [14], although higher when compared specifically with U.S. Hispanics (74% men, 68% women). Nonetheless, our prevalence estimates of oral sex were somewhat higher when we limited our comparison with men and women aged 21–44 years in our study population (men: 88%, women: 88%). Similar to studies in the United States [15,27], both anal and oral sex practices were more frequently reported among men and women in younger age groups. This could be explained by a change in sexual practices over time, as well as the use of these

practices by young individuals as a strategy to prevent pregnancy, retain their “virginity”, or prevent STIs [28,29]. In the case of older individuals, although oral, anal, and vaginal sex is reported in the past 12 months across all age groups, our results are consistent with U.S. data and support decreased sexual activity in women in middle and older age, and although also somewhat decreased, more frequent sexual activity in males, probably influenced by the uptake of sexual dysfunction medication in this group [30,31].

Almost 3% of women in our study reported a history of same-sex sexual intercourse in their lifetime; the same was observed when we limited our analysis to those aged 21–44 years. This result is much lower than the percentage of women aged 15–44 in the US who reported same-sex sexual encounters (11%), although comparable with the lower prevalence of this behavior among Hispanic women in the United States (6.5%) as compared with NHW and NHB women (11–13%) [14]. Meanwhile, approximately 6% of men reported to have had sex with other men, whereas 5.3% reported to have had anal sex with another man. These results are comparable with data obtained from studies in the United States (6.5% of men report oral or anal sex with another man) and Latin American countries (6–20% of men report any kind of sex with another man) [32]. The fact that having had sexual practices with both men and women was more common in older male cohorts and in younger female cohorts warrants attention, as it documents an opposite cohort effect of this behavior by gender. Nonetheless, this finding is limited to the sexual practices and not to the sexual orientation of men or women in PR.

The higher prevalence of forced sexual encounters in our study among women (9.6%) as compared with men (2.5%) is consistent with the higher prevalence of completed rape, defined as forced vaginal, oral, and anal sex, reported by the *U.S. Violence Against Women Survey* in women (17.6%) as compared with men (3.0%) [33]. Given that victims of sexual abuse have been shown to be at increased risk of unwanted pregnancies, STIs, substance abuse, somatic disorders, posttraumatic stress disorders, and other mental health problems in other studies [1,34–37], funding should continue to support integrated public health interventions for sexual abuse victims in PR that are widely available to these groups.

The prevalence of having engaged in sex under the influence of drugs in the past 12 months, of ever having sex with a person with a history of an STI, and of paying/receiving payment for sex were more common among men than women, while the prevalence of having had a sexual partner who had ever injected drugs was highest among young women (21–34 years) and older men (50–64 years). These behaviors are of concern as persons who engage in these behaviors increase the risk of STIs [38–45]; our study results support these associations.

Population-based data on the prevalence of participation in orgies or other group activities where sex is involved is limited. In our study, the overall prevalence of these activities was low (<5%; data not shown), although more common among younger men. Meanwhile, like in the United States, the use of sex toys in PR seems more common among women (18%) than men (5%) [11,46]. Nonetheless, our data suggest a lower prevalence of sex toy use in PR than in the United States, where 53% of women and 45% of men report vibrator use during solo and partnered sexual interactions [11,46]. This result could reflect a more conservative opinion about their use, an issue of availability or lack of willingness to document their use in PR as compared with the United States, while their higher use among the youngest cohort suggests a greater acceptability regarding their inclusion in sexual practices in this group as compared with older cohorts.

Among the strengths of this study, the use of ACASI for the collection of information on sexual practices of participants reduces the potential for information bias, as it results in a

more complete reporting of sensitive behaviors and avoids missing data often found on paper-and-pencil self-administered questionnaires of sensitive behaviors [47,48]. In addition, the population-based design used and the adequate response rate (78% of contacted individuals and similar across all strata) [18] makes our results generalizable to the population aged 21–64 years living in PR; nonetheless, our sampling frame excluded institutionalized and homeless individuals who might have different sexual behaviors. To assess the potential for selection bias, study participants were compared with those who refused to participate and to the population of PR according to the Census 2000 with regard to the age and gender distribution in each geographic stratum [18]. The age distribution of interviewed individuals was similar to those who were not interviewed and to residents of PR across all strata; however, higher participation of females was observed in some strata [18]. Nonetheless, the gender distribution of PR according to the U.S. Census was taken into account in the statistical estimation process. Among limitations, despite the use of ACASI, our study might be subject to social desirability bias, as there is a possibility of underreporting of some sexual practices, a common challenge when exploring sexual practices [49]. Also, information on self-identification of individuals' sexual orientation or gender identity was not collected, nor information on rural/urban status of the study participants, limiting our ability to incorporate these variables into our analysis. Finally, the low prevalence of certain sexual behaviors in the general population may have limited the power of our study to detect an association between these behaviors and STIs.

Conclusion

This population-based study shows a high prevalence of oral and anal sexual practices in PR in both genders, and particularly among younger cohorts. A considerable prevalence of high-risk sexual behaviors and characteristics in PR was observed, including early age at sexual initiation, multiple sexual partners, sex under the influence of drugs, and of paid sex/received payment for sex, with higher prevalence of STIs in persons with these and other sexual behaviors. Gender and age differences in sexual practices were clearly observed, with men and youngest cohorts showing more risky and/or “liberal” sexual behaviors (potential cohort effect). Nonetheless, sexual activity and high risk sexual behaviors showed to be present throughout the life span of the population, and in the case of older adults, these patterns have an impact on continued surveillance of sexual health issues in this group. Public health interventions should focus on the development of age- and gender-specific comprehensive and evidence-based education initiatives to increase knowledge and awareness regarding sexual health, safe sexual practices, and prevention for STIs in PR. Special emphasis should be given to interventions that target men, young adults, and persons with history of forced sexual intercourse. Programs should consider factors that affect people's health decisions, including their perceptions of risks and of their ability to adopt recommended behaviors, physical and social environmental factors, and perceived costs and benefits [50]. Continued research is needed to identify innovative, interdisciplinary approaches to modify risk behaviors that reduce the impact of STIs and promote sexual health in PR, with a focus on examining the causes of these behaviors and their implications for sexual health.

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Table 1

Lifetime age-standardized prevalence and SRR of sexual practices among Puerto Rican men and women aged 21–64 years, 2005–2008 (n = 1,575)

Variable	Overall prevalence*	Age-standardized prevalence (95% CI)		SRR (95% CI) Men vs. women
		Men	Women	
Age at sexual initiation (years)				
15	30.1 (27.3, 33.0)	37.8 (34.1, 41.4)	21.4 (18.8, 24.1)	1.8 (1.5, 2.1)
16–18	35.9 (32.9, 38.9)	42.2 (38.5, 45.9)	33.0 (29.9, 36.0)	1.3 (1.1, 1.5)
19	34.0 (31.1, 36.9)	20.0 (17.0, 23.0)	45.6 (42.5, 48.8)	0.4 (0.3, 0.5)
Number of sexual partners				
1	21.3 (18.8, 23.8)	10.5 (8.1, 12.9)	30.1 (27.1, 33.0)	0.3 (0.2, 0.5)
2–6	49.4 (46.2, 52.7)	41.6 (37.8, 45.4)	56.7 (53.5, 60.0)	0.7 (0.6, 0.8)
7	29.3 (26.4, 32.2)	47.9 (44.0, 51.7)	13.2 (11.0, 15.4)	3.6 (2.9, 4.5)
Number of female sexual partners				
0	55.6 (52.4, 58.7)	0.9 (0.2, 1.6)	97.2 (96.1, 98.3)	0.9 (0.4, 1.8)
1	4.2 (3.1, 5.3)	10.4 (8.1, 12.7)	0.8 (0.2, 1.4)	12.9 (6.6, 30.6)
2–6	19.5 (16.9, 22.1)	41.5 (37.7, 45.2)	1.6 (0.8, 2.5)	25.6 (15.9, 46.3)
7	20.7 (18.1, 23.3)	47.2 (43.4, 51.0)	0.3 (<0.00, 0.7)	138.4 (57.0, 509.5)
Number of male sexual partners				
0	40.1 (36.9, 43.1)	94.2 (92.5, 96.0)	0.6 (0.01, 0.89)	207.2 (94.1, 639.3)
1	18.6 (16.2, 21.1)	2.3 (1.1, 3.4)	30.1 (27.2, 33.1)	7.5 (4.2, 11.9)
2–6	32.9 (29.9, 35.9)	2.9 (1.6, 4.2)	56.9 (53.7, 60.2)	5.1 (3.1, 7.7)
7	8.4 (6.6, 10.2)	0.6 (0.01, 1.2)	12.4 (10.3, 14.6)	4.9 (1.6, 11.1)
Sex with both men and women	4.4 (3.3, 5.6)	5.7 (3.9, 7.5)	2.5 (1.5, 3.6)	2.3 (1.4, 3.9)
Vaginal intercourse	96.8 (95.8, 97.8)	96.0 (94.0, 97.1)	97.0 (96.1, 98.3)	1.0 (0.9, 1.1)
Anal intercourse	60.9 (57.8, 64.0)	64.4 (60.9, 67.9)	57.1 (54.0, 60.3)	1.1 (1.0, 1.3)
Anal intercourse (men-men)	2.3 (1.4, 3.6)	5.2 (3.6, 6.9)	---	---
Oral sex	81.6 (79.3, 83.8)	82.2 (79.4, 85.0)	77.4 (74.9, 79.9)	1.8 (1.0, 1.2)
Sexual partner with history of STI	6.6 (5.3, 8.0)	9.2 (7.1, 11.3)	4.7 (3.3, 6.0)	2.0 (1.4, 2.9)
Sexual partners with a history of IDU	7.3 (5.6, 9.4)	6.3 (4.5, 8.2)	8.2 (6.3, 10.0)	0.8 (0.5, 1.1)
Forced to have sexual relations	6.2 (4.9, 7.6)	2.5 (1.3, 3.6)	9.6 (7.7, 11.6)	0.3 (0.1, 0.4)
Sex in a gathering where a room assigned for sexual encounters	3.0 (2.2, 4.0)	5.9 (4.2, 7.7)	0.8 (0.2, 1.4)	7.4 (3.7, 17.8)
Sex in gathering where a person was brought to have sex with guests	2.0 (1.3, 2.9)	3.9 (2.5, 5.4)	0.3 (<0.01, 0.7)	11.9 (4.5, 45.0)
Sex in an orgy	1.8 (1.3, 2.7)	2.7 (1.5, 3.8)	0.7 (0.1, 1.2)	3.9 (1.7, 10.5)
Sex as a swinger	1.2 (0.7, 2.1)	1.5 (0.6, 2.4)	0.6 (0.1, 1.1)	2.7 (1.0, 8.4)
Paid for sex/received payment for sex	8.0 (6.3, 10.0)	19.7 (16.8, 22.6)	0.7 (0.1, 1.2)	28.5 (14.3, 71.7)
Used sex toys	13.7 (11.3, 16.4)	5.0 (3.4, 6.6)	17.9 (15.4, 20.4)	0.3 (0.2, 0.4)

* Prevalence weighted by the probability of participation, the inverse of probability of selection and geographic strata.

CI = confidence interval; IDU = intravenous drug use; SRR = standardized rate ratio; STI = sexually transmitted infections.

Table 2

Age-standardized prevalence and SRR of sexual practices (past 12 months) among Puerto Rican men and women aged 21–64 years, 2005–2008 (n = 1,575)

Variable	Overall prevalence*	Age-standardized prevalence (95% CI)		SRR (95% CI) Men vs. women
		Men	Women	
Vaginal intercourse	74.3 (71.6, 76.7)	78.0 (75.0, 81.0)	76.3 (73.8, 78.7)	1.0 (0.9, 1.1)
Anal intercourse	31.0 (27.8, 34.4)	33.7 (30.3, 37.2)	29.8 (27.0, 32.7)	1.1 (0.9, 1.3)
Anal intercourse men-men	0.7 (0.4, 1.4)	1.7 (0.8, 2.7)	---	---
Anal intercourse (men-women)	30.3 (27.3, 33.5)	32.1 (28.7, 35.5)	29.8 (27.0, 32.7)	1.1 (0.9, 1.3)
Oral sex	58.1 (55.4, 60.8)	62.3 (58.9, 65.8)	58.0 (55.2, 60.7)	1.1 (0.9, 1.2)
Sex under the influence of drugs	9.8 (8.2, 11.6)	15.7 (13.1, 18.3)	4.1 (2.8, 5.3)	3.9 (2.7, 5.7)
Sexual partner with history of STI	2.0 (1.4, 3.0)	2.6 (1.4, 3.7)	1.7 (0.8, 2.5)	1.5 (0.8, 3.0)
Sexual partners with a history of IDU	2.6 (1.7, 4.0)	2.3 (1.1, 3.6)	2.8 (1.7, 4.0)	0.8 (0.4, 1.6)

* Prevalence weighted by the probability of participation, the inverse of probability of selection and geographic strata.

CI = confidence interval; IDU = intravenous drug use; SRR = standardized rate ratio; STI = sexually transmitted infection.

Table 3
Age-specific prevalence of selected lifetime sexual practices by gender and age-group, 2005–2008 (n = 1,575)

Variable	Men Age (years)			Women Age (years)			P value [*]
	21–34	35–49	50–64	21–34	35–49	50–64	
Age at sexual initiation (years)							0.0003
15	41.4	37.7	33.1	33.6	15.8	14.3	
16–18	43.4	38.2	46.9	40.4	32.4	24.1	
19	15.2	24.1	20.0	26.0	51.9	61.6	
P value [†]	0.064			<0.0001			
Number of sexual partners							0.0072
1	9.2	11.1	11.2	19.6	31.0	42.3	
2–6	43.7	43.4	36.1	60.1	57.7	50.8	
7	47.1	45.5	52.7	20.3	11.3	6.9	
P value [‡]	0.497			<0.0001			
Sex with both men and women	3.3	6.3	8.1	3.1	2.9	1.2	0.0306
P value [‡]	0.086			0.325			
Oral sex	88.5	84.6	70.3	92.2	81.3	52.0	0.0026
P value [‡]	<0.0001			<0.0001			
Vaginal intercourse	96.4	95.5	94.5	99.0	97.5	94.5	0.2293
P value [‡]	0.603			0.008			
Anal intercourse	69.8	66.5	53.9	66.7	59.5	40.9	0.3800
P value [‡]	0.002			<0.0001			
Anal intercourse men-men	2.4	6.4	7.1	---	---	---	---
P value [‡]	0.032			---			
Sex under the influence of drugs	25.8	12.0	8.2	6.8	2.8	2.4	0.9048
P value [‡]	<0.001			0.016			
Sexual partner with	4.8	8.7	15.9	4.1	5.1	4.7	0.0674

Variable	Men Age (years)			Women Age (years)			P value*
	21-34	35-49	50-64	21-34	35-49	50-64	
history of STIs							
P value [†]		<0.001			0.848		
Sexual partners with a history of IDU	1.2	8.5	9.7	10.0	8.9	4.5	0.0001
P value [†]		<0.001			0.848		
Forced sexual relations	3.2	2.7	1.1	13.0	7.5	8.5	0.4425
P value [†]		0.369			0.052		
Sexual activity in gatherings/activities where sex is involved [‡]	13.9	6.0	6.0	2.7	1.4	0.8	0.8031
P value [†]		0.003			0.205		
Sex receiving payment and/or paying for sex	9.9	21.1	30.2	1.7	0.3	0.0	0.0004
P value [†]		<0.0001			0.027		
Used sex toys	7.2	4.2	3.4	25.4	18.1	7.7	0.4554
P value [†]		0.177			<0.001		

* P values are based on the likelihood ratio test for significance of interaction between age and sex in the logistic regression model.

[†] P values are based on the Chi-square test.

[‡] Sexual activity in gatherings where there was a room assigned for sex, in gatherings where there was a person brought to have sex with the guests, having had sex in an orgy or swinging activities. Variables combined because of small numbers.

IDU = intravenous drug use; STI = sexually transmitted infection.

Table 4

Age-specific prevalence of selected sexual practices in the past 12 month, by gender and age-group, 2005–2008 (n = 1,575)

Variable	Men Age (years)			Women Age (years)			P value [*]
	21–34	35–49	50–64	21–34	35–49	50–64	
Oral sex	78.4	66.3	39.0	84.6	63.9	16.3	<0.0001
P value [†]	<0.0001			<0.0001			
Vaginal intercourse	86.4	80.1	68.9	94.9	92.2	46.3	<0.0001
P value [†]	<0.0001			<0.0001			
Anal intercourse	42.4	36.4	20.3	45.6	31.8	7.3	0.0008
P value [†]	<0.0001			<0.0001			
Anal intercourse men-men	1.2	3.1	0.56	---	---	---	---
P value [†]	0.104			---			
Sex under the influence of drugs	26.0	12.3	8.5	6.9	2.9	2.4	0.8993
P value [†]	<0.0001			0.012			
Sexual partners with history of STI	2.8	2.3	2.8	2.7	1.4	0.8	0.4291
P value [†]	0.920			0.201			
Sexual partners with a history of IDU	1.3	2.3	3.8	3.9	3.3	0.8	0.0478
P value [†]	0.311			0.214			

^{*} P values are based on the likelihood ratio test for significance of interaction between age and sex in the logistic regression model.

[†] P values are based on the Chi-square test. Variables combined because of small numbers.

IDU = intravenous drug use; STI = sexually transmitted infection.

Table 5

Association between sexual practices and serum antibodies for selected STIs *

Variable	STI positive n (%)	Age- and gender-adjusted POR (95% CI)
Age at sexual initiation (years)		
15	108 (24.2)	2.15 (1.38, 3.35)
16–18	129 (22.3)	1.64 (1.17, 2.30)
19	109 (20.1)	1.00
Number of sexual partners		
1	48 (14.3)	1.00
2–6	183 (23.8)	3.49 (2.19, 5.54)
7	105 (24.6)	5.37 (3.04, 9.49)
Oral sex		
Yes	270 (21.3)	0.93 (0.63, 1.38)
No	84 (25.1)	1.0
Anal intercourse		
Yes	234 (24.4)	1.93 (1.36, 2.74)
No	120 (18.8)	1.0
Sex with both men and women		
Yes	23 (38.3)	1.99 (1.08, 3.66)
No	322 (21.5)	1.0
Sex under the influence of drugs		
Yes	49 (33.1)	2.94 (2.03, 4.26)
No	305 (21.0)	1.0
Sexual partner with history of STI		
Yes	37 (34.9)	1.81 (0.98, 3.36)
No	317 (21.2)	1.0
Sexual partners with a history of IDU		
Yes	46 (40.7)	2.58 (1.58, 4.21)
No	299 (20.6)	1.00
Forced sexual relations		
Yes	27 (26.5)	0.72 (0.41, 1.26)
No	321 (21.8)	1.0
Sexual activity in gatherings/activities where sex is involved [†]		
Yes	16 (20.8)	1.9 (0.98, 3.74)
No	338 (22.2)	1.0
Paid for sex/received payment for sex		
Yes	48 (33.8)	2.13 (1.34, 3.41)
No	306 (21.0)	1.0

Variable	STI positive n (%)	Age- and gender-adjusted POR (95% CI)
Sex toys		
Yes	42 (22.0)	0.74 (0.46, 1.18)
No	305 (22.1)	1.0

Variables combined because of small numbers.

* STIs include HIV, hepatitis B virus, and herpes simplex virus type 2.

[†] Sexual activity in gatherings where there was a room assigned for sex, in gatherings where there was a person brought to have sex with the guests, having had sex in an orgy or swinging activities.

CI = confidence interval; IDU = intravenous drug use; POR = prevalence odds ratio; STI = sexually transmitted infection.