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You've got male: Internet use, rural residence, and risky sex in men who have sex with men recruited in 12 U.S. cities

Jakub Kakietek, M.A., MPH,

Rollins Schools of Public Health and Graduate School of Arts and Sciences, Emory University, Atlanta, GA.

Patrick S. Sullivan, DVM, PhD, and

Rollins School of Public Health, Emory University, Atlanta, GA.

James D. Heffelfinger, MD, MPH

Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia.

Abstract

Objective—To assess whether the relationship between using the Internet to meet sex partners and unprotected anal intercourse (UAI) differs for men who have sex with men (MSM) living in rural and urban areas.

Methods—Data on Internet use, residence and UAI were collected from MSM attending Gay Pride events in 12 U.S. cities.

Results—Rural MSM who used the Internet to meet sex partners were more likely to report any UAI (aOR: 1.89 (1.12-3.19)) and insertive UAI (aOR: 2.16 (1.13- 4.10)) with the last sex partner than those who did not use the Internet. For urban MSM, UAI was not more commonly reported by men who used the Internet to meet sex partners.

Conclusions—The association between using the Internet to meet sex partners and UAI depended on whether MSM resided in rural or urban areas. Rural MSM may have different patterns of risk behavior from urban MSM. The Internet may offer new prevention opportunities for rural MSM.

Keywords

MSM; Internet; UAI; residence; rural; urban

Introduction

HIV has affected men who have sex with men (MSM) more than any other group in the United States (Hall, et al., 2008; P.S. Sullivan & Wolitski, 2007). Recently, a resurgence in the epidemic among MSM has been reported in the United States as well as in other developed countries (P. S. Sullivan, et al., 2009). Increasing availability and use of the Internet as a venue to meet new sex partners is one of the factors that may explain the increasing number of new infections (Fenton, 2005; P. S. Sullivan, et al., 2009; P.S. Sullivan & Wolitski, 2007). Recent surveys report that between 30% and 50% of MSM have had sex

Address for correspondence and reprints: Patrick Sullivan, DVM, PhD Rollins School of Public Health 1518 Clifton Road NE 4th Floor Emory University, Atlanta, GA 30322 Phone: 404-727-2038 Fax: 866-311-8234 Patrick.sullivan@emory.edu.

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with partners they have met online and there is a growing concern that using the Internet to meet partners is associated with sex behaviors, such as unprotected anal intercourse (UAI), that put men at risk for HIV infection (Benotsch, 2002; Bolding, 2005; J. Elford, Bolding, G., Davis, M., Sherr, L., & Hart, G., 2004; Ross, 2000).

Evidence of the association between meeting partners online and UAI is mixed. Some studies, including the only meta-analysis conducted to date, have shown that meeting partners on the Internet is associated with increased odds of UAI (Benotsch, 2002; Bolding, 2005; J. Elford, Bolding, G., & Sherr, L., 2001; J. Elford, Bolding, G., Davis, M., Sherr, L., & Hart, G., 2004; Liau, 2006). Others have found no association (Chiasson, 2007; Kim, 2001; McFarlane, 2000; Mettey, 2003; Mustanski, 2007; Rhodes, 2002; Ross, 2000; Taylor, 2004; Whittier, 2004). The majority of the studies have been conducted in urban settings. However, Internet use is also common among MSM who live in rural areas (Horvath, 2006), and there is evidence suggesting that rural MSM are more likely to look for sex partners online than their urban counterparts (Niccolai, 2007; Ogilvie, 2008). No published study to date has examined whether the relationship between the use of the Internet and risky sex varies by rural place of residence. The objective of this analysis was to assess whether the extent to which rural men who use the Internet to meet sex partners are more or less likely to engage in sexual risk behaviors differs from the extent to which urban Internet users are more or less likely to engage in sexual risk behaviors.

Methods

Study population

Data on Internet use, sexual risk taking, and demographic information were obtained from the Rapid HIV Behavioral Assessment (RHBA) surveys conducted in 2004 and 2005 during Gay Pride events in twelve U.S. cities classified as low-to-moderate HIV prevalence areas: Iowa City and Des Moines, Iowa, Indianapolis, Indiana, Milwaukee, Wisconsin, Salt Lake City, Utah, Portland, Maine, Portland, Oregon, Manchester, New Hampshire, Minneapolis, Minnesota, Bismarck, North Dakota, Raleigh-Durham, North Carolina, and Wichita, Kansas. A full description of survey procedures can be found in has been reported (Gallagher, 2007). Briefly, men attending the Gay Pride event were approached using systematic flow sampling and asked to complete a short interview administered by a trained interviewer. Men who were aged at least 18 years were eligible to participate. The RBHA surveys were determined by the Centers for Disease Control and Prevention (CDC) to be a public health evaluation activity and did not require approval from the CDC Institutional Review Board.(Gallagher, 2007)

The analysis was limited to men who reported having anal sex and more than one male sex partner within the 12 months preceding the interview. The analysis was so restricted because the RHBA survey instrument asked different questions about the venues where respondents met sex partners depending on whether they had one or more sex partners. Respondents who had only one partner were asked where they met that partner. Respondents who had multiple partners were asked if they met any of their partners on line. Thus, for respondents with only one partner, we could link the venue where the partner was met (online vs. offline) with the type of sex the respondent engaged in with that partner. This was not possible for respondents with multiple partners. Therefore, the responses of the men with one and with more than one partner were not directly comparable. We chose to focus on men with more than one partner because they presumably represent a higher risk group.

To characterize place of residence, respondents' zip codes were matched with data on population density (per square mile) derived from the U.S. Census and included in the

Environmental Systems Research Institute 2005 Data and Maps CD-ROM (Environmental Systems Research Institute, Redlands, CA).

Measures

Our main behavioral outcome was self-reported UAI at last sex. We examined separately any UAI, insertive UAI, and receptive UAI. Use of Internet to meet sex partners was measured by a question about whether the respondent met any of his sex partners within the past 12 months online. Residence was coded based on population density (per square mile) of the respondents' zip codes, which ranged in the sample from 2 to 37,267 persons per square mile (ppsm). The zip codes in the first three quartiles of the distribution (750 or fewer ppsm) were coded as rural and the zip codes in the 4th quartile were coded as urban. The cutoff of 750 ppsm has been previously utilized as a population density threshold in social sciences of population density and service delivery (Ladd, 1992). Our use of the lower quartile also approximates the distribution of urban and rural residents of the United States: according to the 2000 US Census, 21% of Americans live in an area classified as rural¹. Using a dichotomous, rather than a continuous measure of residence was necessary to obtain interpretable estimates of association (odds ratios) for interaction terms.

Descriptive analysis

For all categorical variables (race/ethnicity, education, type of partner at last sex, respondent and last sex partner's serostatus, Internet use to meet sex partners, and UAI), frequencies were calculated and χ^2 tests were done to assess differences in the distribution of the variables between rural and urban MSM, and between MSM who were and were not missing explanatory variables. Age was the only continuous variable used in this analysis. Normality of the age variable was assessed using the Shapiro-Wilk test, and age was found to be non-normally distributed. Therefore, median age is reported and a Wilcoxon Rank-sum test was used to compare age between rural and urban MSM.

Modeling methods

To address the interaction between residence and Internet use to meet sex partners and its association with risky sex behavior, this analysis was carried out in 3 stages. First, the bivariate association between Internet use and risky sex was examined. Second, the bivariate association between Internet use and UAI, stratified by rural versus urban residence was examined, and a Mantel-Haenszel homogeneity test was used to determine statistical significance of the interaction between residence and Internet use to meet sex partners. Finally, the interaction between Internet use and residence was assessed in three separate multivariate logistic regression models (modeling any UAI, receptive UAI, and insertive UAI), where an interaction term (Internet use*residence) was forced into the model to test our *a priori* hypothesis about this interaction. Potential confounding variables identified in the literature as being associated with increased odds of UAI and with using the Internet to find sex partners (age, education, and race/ethnicity, type of sex partner [i.e., main versus casual partner], respondent's serostatus and serostatus of the last sex partner) (Cassels, Menza, Goodreau, & Golden, 2009; Prevention, 2006; Rowniak, 2009; Sanchez, 2006; Snowden, Raymond, & McFarland, 2009; Zablotska, et al., 2009) were entered in the regression models. In order minimize the risk of omitted variable bias, backward, stepwise regression was used with an alpha of 0.05 as a threshold for retaining the variables in each

¹US Census Bureau: United States -- Urban/Rural and Inside/Outside Metropolitan Area GCT-P1. Urban/Rural and Metropolitan/Nonmetropolitan Population: 2000. Available at: http://factfinder.census.gov/servlet/GCTTable?_bm=y&-geo_id=01000US&-_box_head_nbr=GCT-P1&-ds_name=DEC_2000_SF1_U&-redoLog=false&-mt_name=DEC_2000_SF1_U_GCTP1_US1&-format=US-1

model. All analyses were conducted using STATA version 9 (StataCorp LP, College Station, TX).

All first-order interactions were assessed. Internet use to meet sex partners*urban/rural residence was the only statistically significant interaction term and so was the only one retained in the final models.

Results

A total of 4,024 men were approached and 2,686 (67%) accepted the intercept. Overall, 1,364 men (51% of respondents) reported having more than one male sex partner within the 12 months preceding the interview. Information on one or more variables required for the analysis was missing for 121 respondents, and these men were not included in the analysis; information was missing on UAI for 16, Internet use to meet sex partners for 83, age for 10, race/ethnicity for 8, and type of partner (main versus casual) at last sex for 22. Surveys for some men were missing information for more than one variable. Thus, the final sample used in the multivariate models included 1,243 men. The men for whom information on some variables of interest was missing did not differ from the overall sample with respect age, education, type of residence (urban vs. rural) and sexual behavior (UAI, sex with main vs. casual partners, respondent and last sex partner's serostatus). However, there were differences in availability of data by race/ethnicity.

Table 1 presents the descriptive statistics of all variables used in the analysis. Overall, 27% of the men participating in the survey lived in rural areas, 47% reported having met sex partners online within the past 12 months, 21% reported any UAI, 12% reported insertive UAI and 12% reported receptive UAI at last sex.

The prevalence of Internet use to find sex partners did not differ significantly between rural and urban men: 46% of urban MSM and 49% of the rural MSM reported having met sex partners online in the 12 months before the interview. The prevalence of any UAI at last sex was higher in rural than in urban men (25% compared to 19%). Also, rural and urban MSM differed significantly in education, race/ethnicity, and average age (see Table 1).

Bivariate analysis showed no statistically significant association between meeting sex partners online and odds of any UAI (odds ratio [OR]: 1.24, 95% confidence interval [CI]: 0.94-1.64), insertive UAI (OR: 1.25, 95% CI: 0.88-1.78), and receptive UAI (OR: 1.23, 95% CI: 0.87-1.76). However, stratified analysis showed that the odds of any UAI and of insertive UAI were significantly higher for rural men who met partners online than for rural men who did not (OR: 1.87, 95% CI: 1.10-3.20 and OR: 2.10, 95% CI: 1.10-4.10 respectively), but there was no difference in odds of receptive UAI (OR: 1.85 95% CI: 0.95-3.68). For urban men, there was no association between meeting partners online and any category of UAI. The Mantel-Haenszel homogeneity test showed that the interaction between residence and using the Internet to meet sex partners was significant for any UAI and for insertive UAI (see Table 2).

To control for confounding, three multivariate logistic regression models were used, one for each outcome: any UAI, receptive UAI and incentive UAI. Each model included a dichotomous indicator of Internet use to meet sex partners, rural versus urban residence, an interaction term for Internet use and residence, and control variables (age, education, race/ethnicity, serostatus, and type of partner at last sex). The results of the multivariate analysis showed that, for rural residents, using the Internet to meet sex partners was independently associated with increased odds of any UAI (adjusted OR [aOR]: 1.89, 95% CI: 1.12-3.19) and insertive UAI (aOR: 2.16, 95% CI: 1.13-4.10) during last sex. However, the odds of UAI for urban men who met partners online were not higher than for those who met partners

in other venues (see Table 3). The interaction between Internet use and residence was statistically significant for any UAI and insertive UAI. These results were not statistically significant for receptive UAI.

In the model with any UAI as the outcome, non-Hispanic blacks had significantly lower odds of reporting any UAI at last sex than non-Hispanic whites (the reference group) (aOR: 0.22, 95% CI: 0.10-0.53). Men whose last sexual encounter was with the main partner had higher odds of reporting any UAI (aOR: 2.69, 95% CI: 2.02-3.58), than men whose last sexual encounter was with a casual partner. Men, whose last sex partner was HIV positive were more likely to report any UAI than men whose last partner was HIV negative (aOR: 1.76, 95% CI: 1.05-2.94). This model showed no statistically significant association between age, education, or respondent's serostatus and the outcome variable.

In the model with insertive UAI as the outcome, men whose last sexual encounter was with the main partner had higher odds of reporting insertive UAI (aOR: 2.16, 95% CI: 1.13-4.10) than men whose last sexual encounter was with a casual partner. Men whose last sexual encounter was with the main partner had higher odds of reporting any UAI (aOR: 2.73, 95% CI: 1.92-3.88), than men whose last sexual encounter was with a casual partner. In this model, age, education, race/ethnicity, respondent's serostatus and serostatus of the last sex partners were not significantly associated with the outcome variable.

In the model with receptive UAI as the outcome, non-Hispanic blacks had significantly lower odds of reporting receptive UAI at last sex than non-Hispanic whites (the reference group) (aOR: 0.26, 95% CI: 0.09-0.74). Men whose last sexual encounter was with the main partner had higher odds of reporting receptive UAI (aOR: 2.29, 95% CI: 1.61-3.27) than men whose last sexual encounter was with a casual partner. Education was also independently associated with UAI: compared to respondents who had only a high school diploma (reference group), respondents with a college degree had lower odds of receptive UAI (aOR: 0.50, 95% CI: 0.29-0.86). This model showed no statistically significant association between age, respondent's serostatus and serostatus of the last sex partner and the outcome variable.

Discussion

Our main finding was that the association between meeting sex partners on the Internet and UAI varies by place of residence. In rural areas, men who have met partners online were more likely to report any UAI and insertive UAI at last sex than men who met their sex partners in other venues. In urban areas, there was no difference in reported UAI at last sex between men who did and did not use the Internet to meet sex partners. In addition, we found that the odds of reporting UAI were higher in whites, older men, less educated men, and in men who reported last sex with a main partner.

The association between Internet use to meet sex partners and receptive UAI was not significant for rural MSM. A possible explanation for the lack of statistical significance of the association between meeting partners online and receptive UAI in rural MSM is the difference in the perception of risk of the HIV infection attached by MSM to insertive and receptive anal intercourse. Receptive anal intercourse may be considered to be more risky with respect to HIV acquisition than insertive anal intercourse (Cassels, et al., 2009; Rowiak, 2009; Snowden, et al., 2009; Zablotska, et al., 2009). Therefore, it is possible that although rural MSM are willing not to use a condom when they engage in insertive intercourse with partners they meet online, they are less likely to have receptive UAI because it is considered more risky.

It is possible that the mixed results in the recent literature examining the association between Internet use to meet sex partners and UAI stem from the failure to account for the residence of participants in analyses; studies in which participants are predominantly urban would, based on our study, be unlikely to show significant associations, while studies with larger proportions of participants who reside in rural areas might show stronger and/or significant associations between Internet use and risky sex. In fact, U.S. studies with predominantly urban respondents, such as a studies that recruited participants at sexually transmitted disease (STD) clinics in Denver (McFarlane, 2000) and San Francisco (Kim, 2001), no association was reported between meeting partners online and UAI. On the other hand, studies with larger proportion of rural MSM would show significant association between using the Internet to meet sex partners and risky sexual behaviors. According to our RHBA data shows that gay pride events are attended by large numbers of rural men and a study sample recruited at the Atlanta Gay Pride Festival reported a significant association between using the Internet to meet sex partners and risky sex (Benotsch, 2002). However, the published studies cited above did not provide quantitative data on rural versus urban residence of participants; we consider these studies to illustrate our hypothesis that sample composition with respect to rural and urban residence may relate to study conclusion about the association between Internet use and high risk sex.

Our choice of threshold for population density (< 750 ppsm) is empirically derived from the data, and has been previously used in the urban planning research literature (Ladd, 1992). Other studies have employed less direct measures which may pose problems for generalizability and replication. For example, in a study of MSM from Connecticut, only MSM who lived in Bridgeport, Hartford, New Haven, or Stamford were coded as residing in urban areas (Niccolai, 2007). Residence information was based on the state Connecticut Health Department data, and the approach may have resulted in the classification of men residing in suburban areas as rural. Other studies have used the size of respondents' town of residence (Williams, Bowen, Horvath, 2005; Rosser & Horvath, 2008) the distance to the nearest metropolitan area, or a combination of the two (Bowen, Horvath, & Williams, 2007; Bowen, Williams, Daniel, & Clayton, 2008; Williams, Bowen & Ei, 2008). We believe that basing our measure of urban vs. rural residence on self-reported zip codes and publicly available census data has two advantages in terms of replicability. First, zip code is likely known and reported consistently by most men. Second, the public availability of US Census Bureau data means that other researchers can readily replicate our classification system.

One important limitation of this study is the way Internet use to meet sex partners was measured. The RBHA survey asked whether the respondent met any of his sex partners within the previous 12 months online, but not whether the respondent met his last sex partner online. Because we did not ask whether the last partner was met online but asked about high-risk sex with last partner, we could not directly examine whether high-risk sex with the last partner was associated with meeting that partner online.

Another potential limitation is that the study asks for historical data about using the Internet to meet sex partners and UAI, which may be subject to recall bias. Also, self-reported data on UAI can be susceptible to social desirability bias, with MSM under-reporting UAI. This limitation applies generally to the extant literature on use of the Internet to meet sex partners, and risky sex, which (with one notable exception (Mustanski, 2007)) have relied predominantly on cross-sectional surveys. Our findings do not apply to men who only had one partner in the past 12 months, who were excluded from the analysis. Also, we used a convenience sample of MSM attending Gay Pride events, which affects the generalizability of our results. In particular, MSM who are not "out" are likely to be under-represented in our analysis.

Another limitation of our study is that the RBHA data was collected 4 or even 5 years ago. Recent changes in the availability of the Internet and technological developments such as the advent of third generation (3G) cellular networks and the growing popularity of “smart phones” are likely to have impacted the patterns of Internet use among MSM, including using the Internet to find sex partners. For example, applications such as “Grindr” (www.grindr.com), designed specifically for Internet enabled “smart phones”, offer MSM looking for sex online mobile access to potential partners without having to use a traditional, wired computer. Our study does not capture those new technological developments. Given the focus of our study, they may be particularly important due to differential availability of high speed wireless networks (e.g., 3G) in rural and urban areas.

Our findings underscore how limited the current understanding of rural MSM is and suggest that the epidemiology of HIV, risk behaviors, and prevention needs of MSM living in rural areas may differ from those of urban MSM. Our study shows that, in rural areas, using the Internet to meet sex partners is a marker for men who are more likely to engage in risky sex. If our results of this analysis are confirmed, especially with a data source that allows more specific association between meeting a particular sex partner online and high risk sex with that partner, this will have significant implications for HIV prevention. Our analysis suggests that the Internet should be considered an important medium for HIV prevention efforts because it provides a means of reaching rural MSM, and presence in sex-seeking Internet venues is a marker for higher sexual risk among these men. At the same time, Internet-based prevention interventions are particularly well-suited for rural areas where access to health services is limited and other types of interventions are logistically difficult or expensive (Bowen, 2004). Future studies evaluating the effectiveness of web-based interventions should collect information about rural or urban residence of the subjects and, if possible, ensure that an adequate number of men from rural areas are enrolled to allow for an analysis stratified by urban/rural place of residence.

In rural areas, MSM who have met sex partners online were nearly twice as likely to report any UAI and insertive UAI as men who met their partners in other venues. The role of the Internet in the current resurgence of the US HIV epidemic is unclear, but the Internet represents an opportunity to think about prevention in a new way. In particular, the inclusion of web-based interventions into the portfolio of prevention services has a potential to increase the coverage of prevention efforts and reach groups, such as rural MSM at high risk of HIV infection, that have been under-served to date. In order to accomplish this goal, Internet-based interventions will have to be customized to meet prevention needs of those target groups, and tested with diverse groups of MSM, including rural MSM.

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Table 1

Demographic and behavioral characteristics of men who have sex with men (MSM) recruited at Gay Pride festivals in 12 U.S. cities, by type of residence, 2004 -- 2005

	<u>All</u>		<u>Rural</u>		<u>Urban</u>		P	
	N	%	N	%	N	%		
Education								
Grade 1-12 or GED	298	22	78	21	220	22	0.63	*
Some college, associate degree, technical/vocational degree	498	36	155	42	343	35	0.01	*
Bachelor's degree	354	26	75	20	279	28	<0.01	*
Any graduate school	214	16	64	17	150	15	0.34	*
Race/ethnicity								
Non-Hispanic white	1058	78	305	82	753	76	0.02	*
Non-Hispanic black	124	9	20	5	04	10	<0.01	*
Hispanic	103	7	24	6	9	8	0.35	*
Other [†]	162	12	44	12	118	12	0.97	*
Used Internet to meet sex partners [‡]	599	47	169	49	430	46	0.33	*
Last sex with main sex partner	562	42	160	44	402	41	0.4	*
Respondent HIV positive	132	10	28	7	104	10	0.1	*
Last sex partner HIV positive	86	6	17	5	69	7	0.2	*
Had any UAI [‡]	280	21	91	25	189	19	0.02	*
Had insertive UAI [‡]	162	12	53	14	109	11	0.09	*
Had receptive UAI [‡]	161	12	52	14	109	11	0.12	*
<i>Continuous variable</i>								
	Median		Median		Median			
Age	32		31		33		0.1	¶

GED: General Education Degree; UAI: unprotected anal intercourse

* P-value based on a χ^2 test

[†] Includes Asian, Native/Hawaiian or Pacific Islander, American Indians/Alaskan Native, respondents who described their racial/ethnic group as "Other", and respondents who reported multiple races

[‡] in past 12 months

¶ P-value based on a Wilcoxon Rank-sum test.

Table 2

Bivariate associations between Internet use to meet sex partners and unprotected anal intercourse (UAI) at last sex, unstratified and stratified by rural/urban residence, among men who have sex with men recruited at Gay Pride festivals in 12 U.S. cities by place of residence, 2004 -- 2005.

	Any UAI	Insertive UAI	Receptive UAI
	OR (95% CI)	OR (95% CI)	OR (95% CI)
<i>Unstratified</i>	1.24 (0.94-1.64)	1.25 (0.88-1.78)	1.23 (0.87-1.76)
<i>Stratified by residence</i>			
Rural	1.87 (1.10-3.20)	2.10 (1.10-4.10)	1.85 (0.95-3.68)
Urban	1.02 (0.73-1.44)	0.99 (0.64-1.51)	1.03 (0.67-1.58)
$P(\chi^2)^*$	0.049	0.049	0.13

N=1243

OR: odds ratio; CI: confidence interval

* Mantel-Haenszel homogeneity test

Table 3

Interaction of Internet use and rural residence in a multivariate model of unprotected anal intercourse (UAI) at last sex among men who have sex with men recruited at Gay Pride festivals in 12 U.S. cities, 2004 -- 2005.

	Any UAI β (S.E.)	Insertive UAI β (S.E.)	Receptive UAI β (S.E.)
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Education *	dropped	dropped	
Some college			-0.07(0.23) 0.93(0.59-1.47)
Bachelor's degree			-0.69(0.28) 0.50(0.29-0.86)
Any graduate school			-0.32(0.30) 0.72(0.40-1.29)
Race/ethnicity †		dropped	
Non-Hispanic black	-1.48(0.43) 0.22 (0.10-0.53)		-1.33(0.53) 0.26(0.09-0.74)
Hispanics	0.24(0.28) 1.27(0.72-2.24)		0.12(0.37) 1.13(0.54-2.34)
Other ‡	-0.45(0.26) 0.63(0.38-1.05)		-0.92(0.38) 0.40(0.19-0.83)
Main partner	0.99(0.14) 2.69(2.02-3.58)	1.00(0.17) 2.73 (1.92-3.88)	0.83(0.18) 2.29(1.61-3.27)
Age	dropped	dropped	dropped
Last partner HIV positive	0.57(0.26) 1.76(1.05-2.94)	dropped	dropped
Respondent HIV positive	Dropped	dropped	dropped
Interaction			
Urban residence: Used Internet to meet sex partners §	// 1.11 (0.69-1.77)	// 1.12(0.68-2.21)	// 1.23(0.68-2.21)
Rural residence: Used Internet to meet sex partners §	0.64(0.27) 1.89 (1.12-3.19)	0.77(0.33) 2.16 (1.13-4.10)	0.58(0.32) 1.79 (0.94-3.42)
N	1242	1242	1242
Chi²	84.25	40.72	48.75
P(Chi²)	<0.001	<0.001	<0.001

* Referent group is high school

† Referent group is white, non-Hispanic

‡ Includes Asian, Native/Hawaiian or Pacific Islander, American Indians/Alaskan Native, respondents who described their racial/ethnic group as "Other", and respondents who reported multiple races

§ Used Internet to meet sex partners in the 12 months before interview

// A single beta was not estimable for urban men who used the Internet to meet sex partners; the following beta coefficients and standard errors (β (S.E.)) were used to calculate the odds ratio: for Any UAI: β urban residency: $-0.58(0.31)$, β urban residency*Used Internet $0.05(0.23)$; for Receptive UAI: β urban residency $-0.49(0.39)$, β urban residency*Used Internet $0.11(0.29)$; for Insertive UAI: β urban residency: $-0.69(0.32)$, β urban residency*Used Internet $0.13(0.29)$.