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Social support networks and HIV/STI risk behaviors among Latino immigrants in a new receiving environment

Meghan D Althoff^{1,2}, Katherine Theall³, Norine Schmidt¹, John Hembling⁴, Hirut T. Gebrekristos¹, Michelle Thompson⁵, Stephen Q Muth⁶, Samuel R Friedman⁷, and Patricia Kissinger¹

¹Department of Epidemiology, Tulane University School of Public Health & Tropical Medicine, New Orleans, LA

²Tulane University School of Medicine, New Orleans, LA

³Department of Global Community Health and Behavioral Sciences, Tulane University School of Public Health & Tropical Medicine, New Orleans, LA

⁴Department of Global Health Systems and Development, Tulane University School of Public Health & Tropical Medicine, New Orleans, LA

⁵Department of Planning and Urban Studies, University of New Orleans, New Orleans, LA

⁶Quintus-ential Solutions, Colorado Springs, CO

⁷National Development and Research Institutes, Inc. New York, NY

Abstract

The objectives of this study were to (1) describe the quantity and quality of social support networks of Latino immigrants living in a new receiving environment, and (2) to determine the role such networks play in their HIV/STI risk behaviors, including substance use. Double incentivized convenience sampling was used to collect egocentric social support network data on 144 Latino immigrants. Latent class analysis was used for data reduction and to identify items best suited to measure quality and quantity of social support. Moderate and high quantity and quality of social support were protective of HIV/STI sexual risk behavior compared to low quantity and quality of support, after adjustment for gender, years in New Orleans and residing with family. Neither measure of social support was associated with binge drinking. The findings suggest that increased quantity and quality of social support decrease HIV/STI sexual risk behaviors but do not influence binge drinking. Interventions that improve the quantity and quality of social support are needed for Latino immigrants.

Corresponding author: Patricia Kissinger, PhD, 1440 Canal St. SL-18, New Orleans, LA 70112, kissing@tulane.edu, Phone: 504-988-7320, Fax: 504-988-1568.

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Keywords

Latino immigrants; HIV/STI risk behaviors; substance use; social support; latent class analysis

INTRODUCTION

Latinos in the United States are disproportionately affected by HIV and sexually transmitted infections (STI) (1, 2). Latino immigrants are subgroups of Latinos who face particular challenges. Immigration is a stressful process that has been associated with increased HIV/STI risk. Latino immigrants in a variety of settings in the United States have been found to engage in behaviors that may increase their risk of HIV/STI infection, including drug and alcohol use, sex with multiple partners, and patronage of sex workers (3–10).

After Hurricane Katrina in 2005, the Latino immigrant population in New Orleans, Louisiana, which traditionally had a low percentage of Latino residents, nearly doubled(11). Studies of this immigrant population found high levels of drug and alcohol use, as well as social isolation (12, 13). This population was also found to be engaging in high-risk sexual partnerships including sexual concurrency and sex with female sex workers (9, 10). Belonging to a social organization was found to be protective against multiple sexual partnerships, drug use, and binge drinking, which indicates that community support may play a protective role against engaging in high-risk behaviors (10). Another study of this population found the majority of these risk behaviors were adopted upon migration to the U.S. including patronage of a female sex worker, men having sex with men behavior and cocaine usage and that those living with family were less likely to engage in these risk behaviors (14).

Root causes of increased HIV/STI risk include social, cultural, and linguistic isolation, separation from family, spouses, and support systems, lack of non-alcoholic recreational activities, discrimination, and uncertain employment (15–19). Understanding the role of support systems in potentially mitigating HIV/STI risk behaviors following migration may help target interventions to reduce the risk of disease transmission in this population.

In the general population, social support has been linked to a number of improved mental and physical health outcomes including decreased mortality, HIV, depression, dementia, coronary heart disease, drug abuse, and post-traumatic stress disorder (20–27). Social support has also been found to modify the relationship between acculturative stress and physical health (23) and the relationship between discrimination and physical health (21). Studies focusing on the Latino migrant population have found associations between social support and higher wages, decreased depression, and decreased frequency of sexual risk behaviors (26, 28, 29). Among high-risk populations, including non-injection drug users (NIDU), social support has been associated with safer sex practices and a greater promotion of condom use norms (30, 31).

However not all facets of social support have been found to have a positive impact. A study among NIDU found that social support from sex partners increased the likelihood of unprotected sex, which is a problem if the sex partner engages in risk behaviors with other

partners (32). More research is needed on the type of support and characteristics of the social support network. Few studies have examined the quality and quantity of social support and its role in HIV/STI risk behaviors, particularly among migrant populations. The purpose of this study was to (1) describe the quantity and quality of social support networks of Latino immigrants living in a new receiving environment, and (2) to determine the role such networks play in their HIV/STI risk behaviors, including substance use.

METHODS

We conducted a cross-sectional study of Latino immigrants living in the New Orleans metropolitan from October through December 2012, seven years after Hurricane Katrina. Eligibility criteria were 18 years or older, born in a Latin America or Spanish speaking Caribbean country, spoke Spanish and/or English, and resided in the New Orleans metro area, including Orleans, Jefferson, and St. Charles Parishes (county equivalent). Eight seed participants (4 men and 4 women) were selected from a prior study (33) and chosen because they fit the inclusion criteria for the present study. They were interviewed about their sexual, drug and social networks and asked to recruit up to three person in their social network using a double incentivized recruitment strategy. Participants received a \$50 incentive for completing their study visit and an additional \$10 gift card incentive for each coupon returned by an eligible referral (i.e. alters).

Participants were tested for HIV, chlamydia, gonorrhea, and syphilis using testing procedures detailed elsewhere (9). Interviews were conducted in Spanish or English by a fluent speaker using a computer assisted personal interview (CAPI). The survey contained questions on participant demographics, drug and alcohol use, sexual behavior, and collected data on egocentric networks for all sex partners, drug-using partners, and up to 5 social support network members (alters). All participants provided informed consent before entry into the study. This study was approved by the Tulane University Institutional Review Board (IRB-182016) and received a Certificate of Confidentiality (DA-12-035).

HIV/STI Risk behavior measurement

Risk behaviors include past month substance use and high-risk sexual behavior. Substance use was defined as using drugs (marijuana, cocaine, heroin, and others) or binge drinking in the past 30 days. Binge drinking was defined as more than 5 drinks for men or 4 drinks for women within 2 hours (34). Problem alcohol and drug use were measured using the CAGE questionnaire (35). High-risk sex was defined as reporting more than one sexual partner, having sex with a sex worker, having a partner who the participant perceived to have other partners in the past 30 days, or diagnosed with chlamydia or gonorrhea at the time of the interview. Inconsistent condom use was not included in this variable since the majority of instances of inconsistent condom use occurred among married couples with no perceived other partners. Since these partners are likely isolated dyads with a low probability of HIV/STI transmission, it was thought that including inconsistent condom use into the high-risk sex variable would incorrectly classify these participants. Depression was measured using the CESD-10 scale (36). Score were dichotomized where any score 10 or greater indicated depression.

Subjects were asked to identify members of their drug and sexual networks. Risk behaviors were measured using a time-line follow back (TLFB) approach. TLFB is traditionally used to collect data on substance use including drug and alcohol use (37). For this study, we limited the calendar time period to the 30 days prior to the interview date in an attempt to limit problems with recall. Using a calendar, the interviewer recorded when the following events occurred: drug use (including type of drug used), alcohol use and binge drinking, sex (including type of sex, condom use, and partner), involvement in a club or social organization and type, and any relevant anchors. Interviewers used a script to explain the TLFB method to participants and to elicit at least four anchors (individually recognizable time points on the calendar) per participant. A form calendar was used to standardize data collection in the field.

Social support measurement

Social network analysis considers the structure, content, and composition of social support networks in an attempt to operationalize and quantify social support for hypothesis testing (38). In egocentric network analysis, an individual provides information about all network members, also called alters. This information is used to calculate network characteristics and test hypotheses that social support networks influence an individual's behavior (38).

Information on egocentric networks members was obtained for each participant. Participants were asked a series of questions regarding their social networks: 1) In the past month, how many adults have you hung out with or passed time with (including those you did not see face-to-face), 2) of those, how many could you go to for personal advice and support, who could lend you money, or to whom you could go for help? They were then asked to identify up to 5 of the most important persons they have spoken to in the last month. We chose to ask about the most important 5 to minimize participant burden, however additional survey questions were used to determine total social support network size. These social support alters could include people who lived outside of the New Orleans area or the United States. This was done because in our prior work, we found that many persons called family or friends, who were not living in New Orleans, for support. Participants were instructed that they were not required to list 5 people if they did not feel that they had 5 people who provided them support. Alters listed in the sex and drug networks were eligible to be listed in the social support network. Interviewers used a script to generate the social support network numbers and alter names to ensure a consistent definition of social support was given to each participant.

Participants were asked how many people they "hung out with" even on the phone. Then they were asked to identify up to 5 of the most important people from that list and asked questions about each of these alters. These questions included alter demographics, whether the alter could provide financial, emotional, personal, or informational support, whether the alter agrees with the participant's actions, alter substance use, and several measures to determine the quality of social support including: where each alter lives, how frequently the alter and participant speak to one another, and if the participant had seen the alter in the past month. The questions pertaining to modalities of social support were adapted from the Norbeck Social Support Scale (39). Weiss originally proposed multiple modalities of social

support including emotional, instrumental (also called financial), informational, and appraisal support (40). These support typologies do not necessarily influence health outcomes to the same degree, which is why they were measured and assessed separately for this study.

Statistical analysis

Demographic information, risk behaviors, and social support network attributes were described using frequencies, medians or means, and ranges. Network measures were calculated for participants' social support networks including: degree, density, homophily, average quality of relationship, average years known, relationship to participant, and network overlap with sex and drug networks. We used a homophily index, which reports the proportion of a participant's social support network shared the same baseline characteristics (gender, ethnicity, country of origin, and age) (41).

Participants provided detailed information for each of their social support members (up to five) including many social support variables. Latent class analysis (LCA) was used to reduce the large amount of data into underlying latent classes. LCA has been used to reduce social support network data previously (42). Two main latent class analyses were run. The first aimed to determine latent classes of social support by typology. Variables included in this LCA included categorical variables reflecting the quantity (i.e. number) of alters (range 0–5) that could provide the following support types: financial, emotional, informational, personal, and agreement.

The second LCA included variables that may influence the quality of social support. Variables included in this LCA were: number of total social support contacts, number of alters seen in the past month, number of alters the participant spoke to once a week or more, irrespective of if the alters lived in New Orleans, and whether any of the alters live with the participant. The number of alters seen in the past month variable and number of alters that the participant speaks to at least weekly were three-category categorical variables. The total number of social support contacts variable was a continuous variable, which was divided into quartiles when included in the model.

The number of classes for each LCA was selected by choosing the model with the lowest Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). In addition to the statistical measures of model fit, model parsimony and interpretability also played a role in selecting the final number of latent classes for each of the above LCAs.

The traditional classify and analyze approach to assessing the relationship between LCA membership and distal outcomes can produce biased results given that it ignores uncertainty in class membership among LCA models. A model-based approach developed by Bolck, Croon, and Hagenaars (BCH) was utilized to compare demographic characteristics of the latent classes and to calculate unadjusted ORs for the distal LCA outcome of high risk sex (43, 44). This model-based approach is not possible with multivariate models, therefore traditional multivariate logistic regression models were used to adjust for confounders. Since the effect of social support on HIV/STI risk behaviors may differ by gender, effect

modification by gender was assessed. All analysis was performed using SAS 9.2 and PROC LCA was used for the LCAs (45).

RESULTS

Background characteristics of the sample (n=144) are described in Table I. The majority of participants were born in Honduras (72.0%), 59.6% were men, and 36.8% did not speak any English. Participants lived for a median of 6 years (range 0.1–45 years) in New Orleans and 8 years (range 0.1–45 years) in the US. Most participants (75.7%) came to New Orleans post Hurricane Katrina. Men were more likely than women to work in construction, had a higher median weekly income, and live with other adults, whereas women were more likely to work in cleaning or in the home and live with children and a partner. Over half of all participants (51.4%) lived with their partner or spouse.

Among all participants, 35.4% belonged to an organization, 76.5% of which was a church. The prevalence of depression was 25.9% and women were more likely to have depression than men (38.7% vs. 16.0%, $P < 0.002$). Depression was not associated with quality or quantity of social support, binge drinking or high risk sex.

HIV/STI Risk behaviors

The prevalence of high risk sexual behavior was 20.1%, which was higher among men than women (25.6% vs. 12.9%, $p < 0.003$). Those who lived with their partner were less likely to report high risk sex compared to those who did not live with their partner (10.8% vs. 30.0%, $p < 0.005$).

Sixty-six participants (47.1%) reported drinking alcohol and of those who drank 39 (59.1%) reported binge drinking in the past month. According to the CAGE criteria, 14.6% had problem drinking and 9% had problem drug behavior. Six participants (4.2%) reported having been hospitalized or arrested because of drinking.

Nearly 40% of participants reported using drugs in their lifetime, however only 15 participants (16.0%) reported using drugs in the past month. Of those 15 who used drugs, 10 reported smoking marijuana, and 7 used cocaine. Thirteen participants (9.0%) met the CAGE criteria for problem drug use and no participants reported being arrested or hospitalized for drug use.

Only 8 participants (5.6%) reported more than one sexual partner in the past month. Three participants (2.1%) reported having sex with a sex worker. Many more participants reported that they believed that their sexual partner had other sexual partners (16.0%). Of the 137 participants tested for chlamydia and gonorrhea, 6 people (4.4%) had chlamydia. There were no cases of gonorrhea. Of the 139 participants who were tested for syphilis, 3 (2.2%) were reactive in screening, and determined to be secondary syphilis cases after further testing. There were 2 cases of HIV, however both participants were already aware of the diagnosis.

Men were significantly more likely than women to report ever using drugs, past month drug use, opportunity to use drugs, drug abuse, past month alcohol use and binge drinking, ever

being arrested or hospitalized for drinking, and having more than one sexual partner in the past month.

Social support networks

Half (50%) of the sample lived by themselves or with one other family member. Social support network characteristics are described in Table II. Nearly all participants reported having at least one person who could provide financial, informational, emotional, and personal support and over 90% reported having someone in their network who agrees with them most of the time. The majority of participants (93.7%) listed at least one network member who lives in New Orleans and 25.9% named at least one network member who lives in New Orleans and one alter who lives elsewhere. Women were more likely than men to have at least one alter that could provide informational support and men were more likely than women to report a network member who binge drinks.

The median number of people listed in the social support network was 5, the maximum number allowed (range 0–5). The networks do not appear to have much homophily with respect to age and gender, whereas there was high homophily for ethnicity and country of origin. The later homophily measure indicates that the majority of participants listed network members who were also Latino and born in the same country as the participant. The majority of the sample were from Honduras (72%). When the homophily for those not from Honduras ($n=40$) was examined, the median homophily score for was -0.6 (range -1.0 to 1.0) indicating that those from other countries tended to recruit persons who were not from their country of origin. The median density of networks was 1.0 , indicating high connectedness among alters (range 0–1).

Latent class analyses

A three-class latent model was selected for both LCAs (Table S-I, S-II). Model fit statistics are provided in the supplementary materials. The three-class model was selected for the social support quantity LCA because the BIC was the lowest and the AIC was only slightly higher than in the four-class model. The three-class model for social support quality was selected for a number of reasons. The AIC was lowest in the three-class model and appears to level out in the three- to four-class model, whereas it was higher in the two-class model. While the BIC was lowest in the two-class model, it was only slightly lower than the BIC in the three-class model. It was also felt that the three-class model had better interpretability than the two-class model with better latent class separation. Entropy was calculated for all of the possible models and was found to be greater than 0.81 for all calculated LCA's.

The first LCA, which investigated underlying subgroups of social support type, had very little variation between social support type within the classes (Table III). Instead, the three latent classes reflect the quantity of social support to which the participant had access. The majority of participants were in the high quantity support class (59%). Fewer participants (32%) had moderate quantity support, indicating that they have on average 2–3 alters available for each type of support. Finally, only 9% of the study population fell into the low quantity support category, indicating that they have, on average, one or less alters who could provide each type of support.

A three-class model was also selected for the second LCA, which investigated social support quality. Similar to support quantity, the three classes represent high, moderate, and low quality of social support (Table III). The high quality group represents participants who are likely to have at least one alter who lives in New Orleans and at least one who lives with the participant. Additionally, those in the high quality group have a high probability of talking to 4 or more alters at least once per week. The moderate quality group contains participants who are likely to have at least one alter living in New Orleans and speaking to 2 to 3 alters at least weekly. Finally, the low-quality group, which represents 26% of the study population, contained participants who are likely to have no alters living in New Orleans and did not live with any alters.

Although we examined the quantity and quality variables in the third LCA, there was poor latent class separation and homogeneity, likely due to the relatively small sample size. Thus, we do not present these results.

The mean posterior probability was 98.6% for the first LCA and 92.6% for the second LCA. There was some overlap in group membership between the two LCA results. More participants fell into the low quality social support group than the low quantity support group (26% vs. 9%). Overall, 65.3% of participants were in the same group (ex: high-quantity and high-quality) in both LCAs. The kappa for agreement between groups above chance was 0.43 (95% C.I. 0.32, 0.54).

Quality and quantity of social support were not associated with gender, income, marital status, employment status, depression, or belonging to a club (Table III). Persons born in Honduras were more likely to have a higher quantity of support but not quality of support. Those who lived with family had higher quality of social support than those who did not, however this was not associated with quantity of support. Years living in New Orleans was positively associated with both quantity and quality of support. It is worth noting, however, that the BCH model-based analysis approach compared mean years in New Orleans but that this variable had a skewed distribution. Using a Kruskal-Wallis test and the Classify and Analyze Approach, years in New Orleans was not statistically significantly associated with either metric of social support.

Substance use

Individual social support measures and quantity ($p=0.558$) and quality ($p=0.236$) of social support were not associated with substance use. Men were more likely than women to have any substance use, use drugs and have problem drug use, and to binge drink, however were as likely as women to have problem alcohol use (Table II). Multivariable analyses were not performed given the lack of association in the unadjusted analyses.

High risk sex

The prevalence of high risk sex was 20.1%. Men were more likely to have multiple partners and to have chlamydia. Those who engaged in high risk sex were more likely to be substance users (55.2% vs. 23.5%, $p < 0.01$). In the unadjusted models, social support was protective against high-risk sexual behavior for both qualitative and quantitative social support, with a dose response quantity of social support. Gender, years in New Orleans and

living with any children were identified as confounders. After adjusting for these potential confounders, both qualitative and quantitative social support remained protective for high risk sex (Table IV). There was no noted interaction between social support and high risk sex by gender.

DISCUSSION

In this sample of Latino immigrants living in New Orleans post hurricane Katrina, most reported high quantities of social support and a low prevalence of past month HIV/STI risk behaviors, including substance use. Increased social support (both quantity and quality) was associated with lower HIV/STI sexual risk behavior. Neither quantity nor quality of social support was associated with substance use.

This was a pilot study with a small sample size and the statistics are susceptible to beta error. Moreover, our sampling methodology may have led to a homogenous and correlated sample. Samples of Latino immigrants in new receiving communities can be difficult to assemble. In early migration, it was easy to identify immigrants as many were day laborers and congregated in known areas (1, 33). In those instances we used venue-based sampling. As time passed from Hurricane Katrina, the Latino population evolved from migrants to immigrants and were more dispersed throughout the city. Though New Orleans is a sanctuary city, Latinos can be difficult to sample. We chose to use a double incentivized convenience sample to assemble this hard-to-reach population. Future studies should evaluate the benefit of chain referral for immigrants who are established in communities.

The high proportion of participants reporting a spouse or partner (65.3%) and living with family (72.2%) indicates that this population had a high degree of social connection. Members of this cohort were not all newcomers to New Orleans, 24.1% and over half of those had been living there for over 15 years. The majority of the sample was Honduran and they tended to recruit Hondurans. The majority of participants had complete homophily of race and country of origin and had known the persons they referred for many years, which may have caused homogenous sampling. Participants frequently listed parents and other family members in their social support network, which explains the lack of age homophily and is concordant with the long median length of time that participants have known network members. These network statistics indicate that this population is not forming completely new social support networks post migration, rather they still receive support from long established relationships and family members, regardless of whether or not they reside in the same country as the participant. Future studies with larger samples should examine if there are any differences by time of residence in the area.

The first LCA was intended to find classes of social support type so that quantity of social support could be measured. The results, however, indicated that participants reported similar amounts of each of the social support typologies. The lack of variability could have been due participant fatigue as the survey was very long or because we limited our inquiry to the 5 most important social network members. Future studies should evaluate the quantity of support using a more diverse and larger sample.

The LCA on social support quality also found three classes that corresponded to high, moderate, and low classes of social support, similar to the LCA for quantity of support. Interestingly, there was some variation between the classifications of participants between the two latent class models. The kappa statistic indicated fair agreement between the two groups. The number of participants in the low quality group was much higher than the low quantity group (26% vs. 9%). This suggests that surveys that only collect social support quantity information may not be capturing the full picture of social support and may potentially overestimate the social support available to Latino immigrants. This is likely especially important among immigrant populations, where their support network may be in a different country and challenging to access.

The participants in the low quality group had a low probability of having any support network members living in New Orleans. Additionally, they had a high probability of having seen zero to one of their network members in the past month, indicating that they have not recently returned to their home country to see these network members. The overall quality of social support may be considered a proxy for the quality of support a person receives. Quality of social support has been found to be an important predictor of many health outcomes including: depression, medication adherence, and physical and mental health (46–49), however the importance of quality and quantity of social support have not been researched with respect to HIV/STI risk behaviors. While limited by small sample size in this study, the evaluation of possible interaction between quality and quantity of support would be worth pursuing in future studies. It is unlikely that these modalities of support are completely independent and it is certainly plausible that having the highest forms of both types of support could be synergistic.

There may have been some social desirability bias in participant responses since we collected sensitive personal information on sexual behaviors and substance use in a face-to-face manner. While the concept of social support quality is likely an important aspect of social support, variables that are important components of support quality were selected by the authors and reflect what components the authors feel are important to the quality and quantity of support. Since participants' true class memberships cannot be known, it is possible that some of the participants were misclassified with respect to quality of social support.

Despite the limitations, this study contributes to the body of knowledge on social support among the Latino migrant community. To our knowledge, this is the first study to investigate the relationship between social support and HIV/STI risk behaviors among Latino immigrants. The majority of previous research on social support has focused on the type of social support. While we examined social support typology, we also investigated the quality of support received and looked for variations in quality among the different social support types. The use of egocentric network data provided challenges; however it also provided rich data on the social support of each participant. It appears that both quality and quantity of social support are protective against engaging in high-risk sexual behavior.

CONCLUSION

Quantity and quality of social support appear to influence HIV/STI sexual risk. While these findings need to be reproduced in larger and more diverse samples of migrant workers, they do suggest that interventions that improve social support on multiple levels (i.e. financial, social, emotional, and informational) will be beneficial in HIV/STI sexual risk reduction.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Mean (SD)				Median (range)		
	Men	Women	P-value	Men	Women	P-value
Age	35.6 (11.4)	36.3 (11.6)	0.7523	6 (0.1–36)	4 (0.25–45)	0.8760
Years of education	8.7 (3.7)	8.2 (3.4)	0.3785	8 (0.1–45)	8 (0.25–45)	0.9742
Social network ^a						
No. of social contacts	20.6 (41.1)	11.9 (14.9)	0.1151			
No. of support contacts	6.8 (11.2)	5.1 (6.7)	0.2919			
N (%)				N (%)		
Country of birth				Depressed	24 (38.7)	0.0144
Honduras	60 (73.2)	43 (70.5)	0.6083	Perceived black racial composition		
Mexico	6 (7.3)	2 (3.3)		Mostly Latino	18 (29.0)	0.9620
Guatemala	1 (1.2)	2 (3.3)		Mostly African	10 (12.2)	
Nicaragua	10 (12.2)	9 (14.8)		Mostly White	6 (7.3)	4 (6.5)
El Salvador	2 (2.4)	0 (0.0)		Racially mixed	43 (52.4)	34 (54.8)
Costa Rica	0 (0.0)	1 (1.6)		Home composition		
Dominican Republic	1 (1.2)	1 (1.6)		Lives with other people	80 (97.6)	62 (100.0)
Cuba	2 (2.4)	3 (4.9)		Lives with family	53 (64.6)	51 (82.3)
Employment				Lives with children	37 (45.1)	41 (66.1)
Construction	47 (57.3)	2 (3.2)	<0.001	Lives with partner	33 (40.2)	41 (66.1)
Painting	8 (9.8)	2 (3.2)		Lives with adults	66 (80.5)	24 (38.7)
Restaurant or bar	2 (2.4)	3 (4.9)		Relationship status		
Landscaping	2 (2.4)	0 (0.0)		Single	29 (35.4)	13 (21.0)
Cleaning	3 (3.7)	23 (37.1)		Married	22 (26.8)	19 (30.7)
Housewife	0 (0.0)	17 (27.4)		Partner, not married	25 (30.5)	28 (45.2)
Childcare	1 (1.2)	7 (11.3)		Divorced/separated	6 (7.3)	1 (1.6)
Mechanic	3 (3.7)	0 (0.0)		Widowed	0 (0.0)	1 (1.6)
Other	14 (17.1)	2 (3.2)		English language use		
Unemployed	2 (2.4)	6 (9.7)		Some to a lot	56 (68.3)	35 (56.5)
						0.1446

	Mean (SD)			P-value	Median (range)			P-value
	Men	Women			Men	Women		
Income								
< \$380 per week	24 (29.3)	56 (90.3)		<0.001	Not at all	26 (31.7)	27 (43.6)	
\$380 per week	58 (70.7)	6 (9.7)			Speaks English^b			
Mobility in past year					Some to very well	67 (83.8)	48 (80.0)	0.6572
Left New Orleans >1 week	35 (42.7)	30 (48.4)		0.4958	Not at all	13 (16.3)	12 (20.0)	
Returned to home country	6 (7.3)	4 (6.5)		0.2545	Involvement in a social organization	23 (28.1)	28 (45.2)	0.0335

^b
n=140

Table II

High risk sex and substance use outcomes by Sex

	Men (N=82)	Women (N=62)	P-value
High risk sexual behavior	25.6%	12.9%	0.0921
Sex with sex workers	3.7%	0.0%	0.2593
High risk partners	18.3%	13.1%	0.4930
Multiple sexual partners	9.8%	0.0%	0.0104
Chlamydia positive	7.6%	0.0%	0.0387*
Any substance use	45.1%	9.7%	<0.001
Binge drinking	40.2%	9.7%	0.0021
Drug use	17.1%	1.6%	<0.0001
Problem drinker	15.5%	12.9%	0.6190
Problem drug user	14.6%	1.6%	<0.008

* Fisher's exact, of 79 men and 62 women

Table III

Participant Characteristics by Social Support

	Quantity of support				Quality of support			
	Probability of distal outcome				Probability of distal outcome			
	Low	Mod	High	P-value	Low	Mod	High	P-value
High risk sex	0.55	0.22	0.14	0.0098	0.38	0.12	0.14	0.01653
Binge drinking	0.23	0.19	0.32	0.3192	0.35	0.10	0.31	0.1878
Drug use	0.24	0.13	0.07	0.1903	0.13	0.11	0.09	0.7701
Age Mean (SE)	33.5 (3.39)	34.8 (1.66)	36.9 (1.19)	0.4393	35.2 (1.86)	37.3 (2.14)	35.6 (1.41)	0.7603
Years of education Mean (SE)	7.2 (0.85)	8.1 (0.51)	8.9 (0.40)	0.1517	8.0 (0.57)	7.5 (0.69)	9.2 (0.46)	0.1077
Years in New Orleans Mean (SE)	5.5 (0.97)	6.9 (0.88)	9.3 (0.99)	0.0271	5.1 (0.48)	7.2 (1.22)	10.3 (1.22)	0.0002
Women	0.46	0.46	0.41	0.8618	0.33	0.57	0.42	0.2298
Born in Honduras	0.53	0.86	0.67	0.0483	0.68	0.84	0.68	0.3850
Income >median	0.48	0.48	0.46	0.3015	0.59	0.30	0.44	0.0977
Depressed	0.39	0.26	0.27	0.6677	0.43	0.27	0.20	0.0623
Lives with:								
Family	0.69	0.79	0.69	0.5500	0.45	0.86	0.80	0.0009
Children	0.30	0.51	0.36	0.2528	0.28	0.54	0.40	0.1556
Partner	0.38	0.55	0.52	0.6059	0.33	0.57	0.58	0.0568
Adults	0.53	0.72	0.59	0.2867	0.72	0.56	0.61	0.4210
Relationship:								
Single	0.39	0.30	0.27	0.6873	0.35	0.34	0.24	0.5149
Married	0.15	0.26	0.32	0.4582	0.26	0.16	0.35	0.2599
Partner	0.47	0.35	0.36	0.7546	0.38	0.42	0.35	0.8428
Speaks at least some English	0.77	0.80	0.85	0.7059	0.90	0.74	0.83	0.3138
Involvement in social organization	0.31	0.32	0.38	0.7941	0.31	0.31	0.39	0.6729

Table IV

Relationship between social support and high-risk sex (n=144)

Unadjusted models	OR (95% CI)	Adjusted models ^a	OR (95% CI)
Quantity of support		Quantity of support	
Class 1: High	0.13 (0.04, 0.49)	Class 1: High	0.12 (0.03, 0.45)
Class 2: Moderate	0.22 (0.06, 0.89)	Class 2: Moderate	0.23 (0.06, 0.87)
Class 3: Low	Ref	Class 3: Low	Ref
Quality of support		Quality of support	
Class 1: High	0.27 (0.10, 0.73)	Class 1: High	0.28 (0.10, 0.79)
Class 2: Moderate	0.23 (0.05, 0.98)	Class 2: Moderate	0.29 (0.09, 0.99)
Class 3: Low	Ref	Class 3: Low	Ref
Alters in New Orleans	0.33 (0.13, 0.84)	Alters in New Orleans	0.45 (0.17, 1.19)
Financial support	0.47 (0.18, 1.25)		
Informational support	0.63 (0.27, 1.47)		
Emotional support	0.58 (0.25, 1.34)		
Personal support	0.42 (0.16, 1.13)		
Agrees with	0.56 (0.23, 1.33)		
High density network	0.80 (0.34, 1.89)		

^a Adjusted for gender, came to New Orleans after Hurricane Katrina, lives with family Supplemental material