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Determinants of Alcohol Use, Risky Sexual Behavior and Sexual Health Problems Among Men in Low Income Communities of Mumbai, India

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Abstract

This paper summarizes the main results of the survey component of a mixed methods study of alcohol and sexual risk in a general population of young men 18–29 residing in low income communities in the Greater Mumbai area. The survey included demographic variables, and scales and indices measuring work related stress, social influence, exposure to alcohol in childhood, and currently, hyper masculinity, exposure to media and pornography, risk related leisure time activities and alcohol and alcohol/sex expectancies. Measures of alcohol use included frequency/amount/contextual use of six different types of alcohol, a general estimate of frequency and amount (AUDIT), and an estimate of total ml. alcohol consumed in the past 30 days, based on estimates of alcohol content in all types of alcohol consumed, by unit of consumption (glass, peg, bottle) etc. Sexual outcome measures included types and number of partners ever and in past year with and without alcohol, and a critical event with most recent partner (with or without alcohol) and culturally specific indicators of sexual health related to sexual risk taking. A cluster sampling protocol and the use of a screener produced a sample of 1239 men, 1071 thirty day drinkers and 161 nondrinkers. Logistic regression analysis (binary and multinomial) showed relationships between predictor variables and alcohol consumption and alcohol and sexual risk indicators as

well as two of the sexual health indicators associated with extramarital sex. Risk behaviors are associated with higher levels of alcohol consumption in this low risk general population of married and unmarried men. Implications for intervention include: (a) reducing or eliminating home drinking, to reduce early childhood exposure; (b) including alcohol in sexual risk and HIV prevention programs; (c) improving couples (married or unmarried) communication to reduce men's search for sexual alternatives, and (d) treating *garma* as an indicator of sexual risk taking rather than STIs.

Keywords

Alcohol; Mumbai; Heterosexual men; Sexual risk; Sexual health

Introduction

India now has the second largest number of HIV infected persons in the world [1]. The rise in HIV infections in India has been associated with three main factors: migration, labor mobility and the increasing use of alcohol among high risk populations and the poor. There is considerable concern that widespread and increasing alcohol use is fueling the epidemic and acting as a catalyst in shifting it beyond high risk populations into the general population of rural and urban men and women, together with the exposures to sexual risk encountered by male migrants and mobile workers. Alcohol use is increasing in India as a source of revenue for local governments and as a symbol of globalization and modernization [2]. The fear that HIV could spread into low income urban communities through various forms of sexual engagement, coupled with the widespread belief that alcohol consumption is high in urban slums, has prompted a series of prevention studies and interventions in low income urban areas of north as well as south India.

In the study reported on here, the Mumbai area was selected for several reasons. First a number of reports from sentinel surveillance sites (pregnancy clinics, STI clinics) showed dramatic increases in the number of HIV infections [1, 3–7]. Second, Mumbai is the site of two very large brothel areas, a large street and informal commercial sex work sector and a beach based sex trade. For many decades Mumbai, as the commercial heart of the country, has attracted permanent migrants and, more recently, temporary short and longer term mobile workers. More than fifty percent of the population of this city of more than twenty million residents live in designated “slum” areas or temporary housing along railway tracks and roadsides, with average annual per capita income of less than \$200. The prohibitive cost of housing and the challenges of finding work in Mumbai preclude many married young migrants from bringing their wives to live with them in the city. Finally, the concentration of economic enterprises in the city as well as the wholesale market that serves the entire Mumbai urban area results in the daily arrival and departure of up to 70,000 truckers from different parts of the country in search of resources, companionship and entertainment. These factors constitute some of the social and health risks that contribute to the potential for accelerating the HIV rate in the city. Ways in which migration history, employment, life stress, the challenges of meeting masculine expectations in a difficult economic environment, economic, education and marital status, and exposure to social influence and

sexualized entertainment contribute to increased alcohol consumption; and whether increased consumption is associated with risky and unprotected sex are focal questions in research on the alcohol/HIV link.

Here we report on the results of one such study of patterns and predictors of alcohol use among young married and unmarried men between the ages of 18–29 in three typical low HIV prevalence designated-slum communities in the Greater Mumbai area. The goals of this mixed methods study were to learn about patterns of drinking and meanings associated with alcohol use, to identify predictors of consumption in thirty day drinkers, using qualitative and quantitative methods, to investigate the potential links between alcohol use, sexual risk behavior and sexual health, in general and in critical events linking alcohol consumption and penetrative sex and to suggest ways to reduce alcohol consumption and associated sexual risk based on data from the study communities.

Alcohol Use and Risky Sex

Cross-sectional and longitudinal research on the relationship between alcohol and sexual risk has shown consistent associations across a variety of situations, age groups and countries [8–12]. Studies support the relationship between alcohol and early sexual debut [13], multiple partners [14, 15], inconsistent condom use, or lack of protection during intercourse [16, 17] unwanted pregnancies, and sexual violence, including sexual abuse, forced sex, and rape [18, 19]. Recent research has shown that alcohol plays a role in condom use when gender and partner type are considered [20]. They showed that for women only, condom use was less likely when alcohol consumption preceded sex with non primary partners. Heavy drinkers are more likely to engage in high risky sexual behavior, including sex for money [21]. They have more sexual partners [22], and use condoms less consistently [23–25], though these associations are not always consistent.

Alcohol use and sexual risk behaviors are the result of a variety of factors at multiple levels [26, 27] which act as determinants of vulnerability. Among the more important contributors to vulnerability are migration and mobility, which have consistently been associated with substance use and sexual risk [28, 29]. Studies in India show that both migration (one time move from place of origin to place of current residence) and mobility (short and long term duration, without moving from place of origin) result in conditions that increase exposure to sexual risk, leading to transmission of infection from high to low prevalence areas [30–37]. In particular, long term mobile workers (those who remain away from home for more than 1 month during the year) and married men with distant wives have been shown to be involved in both high levels of alcohol use and risky alcohol use and transactional sex involvement [38, 39]. Other types of work associated with alcohol consumption include quarry work and heavy labor (e.g. Mathadi workers), which contribute to work related stress [40]. Such work also involves working in groups, where peers influence each other both for work and for recreation, and produce some disposable income to cover the cost of alcohol use and transactional sex [41]. These risks can be exacerbated by higher density of alcohol and transactional sex venues and locales within urban communities that include large numbers of migrants [42]. Increasingly, research shows that social influences, peer norms, and peer pressure are key factors in individual behavioral decision-making and behavior change. A

comprehensive vulnerability model for American adolescents, developed in the 1980s by Newcomb and Felix-Ortiz [43] that includes risk and protective factors has been applied to in-school adolescents in India [44] but falls short of explaining changes in alcohol use and sexual risk among older youth and adults in other settings in the United States or internationally [45].

There are cultural expectancies and behavior linking masculinity, sexuality, alcohol use and STDs/HIV risk in India. Recent research illustrates the role of peer influence and performance anxiety in promoting young men to have sex with sex workers just prior to or following marriage [46–48]. Both married and unmarried men seek risky sex contacts to avoid excessive semen loss through masturbation [49, 50]. Men use sex manuals, pornographic literature and telephone hotlines to inquire about masturbation and semen loss, sexual performance, “excessive indulgence” in sex, partner relationships, homosexuality, “normal” sexual responses, penis size, condoms, pregnancy, and AIDS [46, 50–53]. Cultural beliefs linked to sexuality, sexual performance and masculine identity support the search for female partners [46]. Blue films and other forms of pornography [54] provide sexual fantasies that are played out with readily accessible commercial sex workers who are reported to be willing to respond to men’s requests for specific behaviors [46]. Current research suggests that alcohol plays a role in enhancing sexual self-efficacy, reducing fears of performance inadequacy, reducing inhibitions regarding seeking sexual services, heightening expectancies about the right to sexual experience with wives, and increasing the potential for sexual violence [55].

Finally, despite broad based efforts to provide HIV/AIDS prevention to the general population most focused interventions emphasizing education and condom use have concentrated on high risk groups, especially female and male sex workers and long distance truckers [56–61]. Lack of access to alcohol and HIV related information, and preferred avoidance of condom use remains a problem especially in low income communities. Coupled with reduced literacy levels [42], the results is continued lack of information about HIV related risks [62, 63]. The interaction of these social, contextual and cognitive factors creates the potential for high HIV/STI rates in vulnerable low income communities and the possibility that infection could bridge from high risk to these newly vulnerable groups [64]. In the analyses to follow we explore this potential.

Methods

This paper reports on survey data collected as part of an NIAAA funded study entitled *Alcohol, Sexual Health Risk and AIDS prevention among men in low income communities, Mumbai*” carried out by the International Institute for Population Sciences, Mumbai, and the Institute for Community Research, Hartford, CT., U.S.A. (2006–2008).¹ The study focused on men between the ages of 18 and 29 and was conducted in three low income communities in Navi Mumbai (New Bombay), a satellite city of Mumbai that includes traditional communities, newer slum areas, and middle class apartment residences. The study area is situated in close proximity to the Greater Mumbai central wholesale market, a large

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industrial area that offers employment for many residents at all income levels, a commercial quarry, and a red light district consisting of approximately 200 brothels. In the study area, there are many formal and informal alcohol outlets and wine shops and a number of public locations such as toilets, parks and temple grounds, where people drink. Key informants reported that alcohol use was widespread and an increasing problem especially among unemployed youth. Of the three study communities, two, were older and had more stable (*pukka*) housing and more established commercial establishments. The third was newer, less well developed and included more newly arrived migrants and more informal alcohol outlets.

The study was approved by the Indian Council for Medical Research (ICMR), the IEC of the International Institute for Population Sciences, and the IRBs of the Institute for Community Research and the University of Connecticut Health Center. All research staff received NIH/OHRP training on research ethics and the protection of human subjects. Written consent was obtained for all survey interviews using consent forms and formats translated from English to Hindi and back-translated.

Study Sample—The study survey sample included 1239 men between the ages of 18 and 30. To obtain the sample, trained survey researchers clustered all three communities into groupings of approximately 150 households. Using data on alcohol consumption based on our own and others' prior studies in similar slum communities, we estimated that 30% of households would produce one male thirty day drinker in the target age group. We selected a random sample of clusters with a sufficient number of households to produce approximately 1000 drinkers, or approximately 330 drinkers per community. Field researchers enumerated households in selected clusters, and screened all households for age eligible men. If there was one eligible, that individual was screened for thirty day alcohol use. If there was more than one, a KRIS table was used to identify the age-eligible candidate who was then screened for at least one instance of alcohol use in the past 30 days. All such thirty day drinkers thus identified were interviewed, producing a sample of 1072 thirty day drinkers. The study also included every seventh so-identified nondrinker producing a sample of approximately 161 nondrinkers as a comparison group. The total survey N was 1239. All the field interviewers were trained comprehensively in rapport building and survey interview administration. Surveys were quality checked in the field. After certification as complete by the field supervisors they were checked at IIPS, and entered and checked by a data entry team. The cleaned data set was sent to Connecticut where variable and scales were constructed and the data were prepared for sharing and eventual public access. Additional qualitative and spatial data gathered during the study are utilized in other papers in this supplement.

Measures—Continuous demographic variables were transformed for use into categorical variables. Likert scales were analyzed using factor analysis and PCA, and standardized or transformed into categorical variables. For this paper, all relevant scales and indices were transformed into categorical variables for use in logistic regression analysis. Variables used in the analysis include the following:

Background Variables: Age, education level, place of origin, occupation, marital status, duration of residence in community/Mumbai, standard of living and religion. Variables were divided into three to five groupings depending on the variable.

Psychological Variables: Hyper-masculinity: A nine items on a 4 point Likert scale measuring a man's right to control wife's activities, spending money and child's education and decision to engage in risky behaviors such as gambling, drinking and going out with friends. The scale (alpha coefficient 0.70) was standardized from 0 to 10, and categorized into three equivalent groups with cutoff points of low, 1–2.6, moderate, 2.6001–2.9 and high 2.9001–3.

Exposure to Alcohol: Childhood exposure: three items on a 4 point Likert scale standardized from 0 to 10, and converted to a categorical variable with three approximately equal groupings (cutoff points 0 = no exposure; 1–3.2 = moderate exposure and 3.3 and above = high exposure).

Social Influence to Drink: Social Influence (pressure from others) to drink: a 13 item, two point scale (0 = no; 1 = yes) with a range of 0 = 26, normalized, transformed to a ten point scale, and divided into three equivalent categories, low, moderate and high (0–2.77 = low; 2.78–5.55 = moderate; and 5.56–9.61 = high).

Leisure Time Activities: Eight items that include activities men do with friends that are known to be associated with sexual risk behavior such as roaming, drinking, playing cards, gambling, seeking women etc. transformed by hand into a Guttman Scale from 0 = 8, organized into three equivalent categories: (one, two and three or more activities).

Attitudes/Expectancies: Alcohol use and Sexual Expectancies: a 4 point Likert scale based on 13 items in which higher = more risk related expectancies and fewer risk related precautions. Alpha coefficient 0.76, rescaled to range of 0–10 and recoded into three equivalent categories low (0–5) medium (5.01–5.79) and high (5.79–10).

Condom Attitudes: Seven yes–no items measuring behavioral beliefs/attitudes about condom use for HIV protection in which 1 = positive (pro-protection) and 2 = negative (pro-risk), summed as an index of condom attitudes ranging from 7 = lowest to 14. The index was standardized into a range from 1 to 2 with lower scores indicating more positive attitudes toward condoms and higher scores indicating more pro-risky attitudes. Examples of items include “condoms can prevent sexually transmitted disease”, “condoms can tear”, and “condoms reduce pleasure of sex”. The standardized index was recoded into three groups (1.00 thru 1.20 = 1; 1.21–1.50 = 2; 1.51 thru highest = 3).

Alcohol Use: Level of Drinking: This measure was created by combining the first two items of the AUDIT, a globally utilized measure for estimating problem drinking, frequency of consumption of alcohol in the past 30 days (never, Monthly or Less; 2–4 times a month; 2–3 times a week; four or more times a week) and number of drinks per occasion (1 or 2; 3 or 4; 5 or 6; 7, 8 or 9; 10 times or more). First the categories assessed for frequency of drinking were grouped into low (drinking once a month or less), moderate (drinking 2–4 times a

month) and high (drinking two or more times a week) and were grouped with amount of drinks at a time (1–2 drinks = low; 3+ = high). The variable “level of consumption” was created by combining low amount/low frequency, low amount/moderate frequency, and substantial amount/low frequency into “low level of consumption”; “low amount/high frequency and substantial amount/moderate frequency into moderate level of drinking” and substantial amount/high frequency into “high level of drinking”. Subsequently, to find the adjusted effects of different predictors on the level of drinking using a generalized linear model, these three categories were grouped into two, low and substantial (moderate plus high level of drinking). A correlation between level of drinking and thirty day consumption of pure alcohol (by ml) was significant ($F = 422.7, p < 0.001$) confirming significant differences across all three levels in mean ml. alcohol consumed, and validating the measure.

Type of Partner in Past Twelve Months: This variable consisted of four groups: Respondents with no sexual partner (not sexually active), respondents with only one partner (wife); respondents with only one partner (girl-friend) and respondents with “other partners” (including casual acquaintances, FSW and neighbors).

Condom Use at Last Sex with Nonspousal Partner (Neither Girlfriend Nor Wife): Recorded as whether the respondent used a condom at last sexual intercourse with a woman other than his wife or only girlfriend (0 = no; 1 = yes).

Sexual Health Problem: *Dhat* (semen loss) consisted of an index of four items (0 absent; 1 present), including wet dreams, masturbation. *Kamjori* (weakness) consisted of an index of seven items including loss of erection and lack of sexual desire; *Garmi* (sores due to excessive heat), consisted of an index of five items including burning, itching, swelling of genitals, ulcers (0 absent, 1 present). Each condition was scored as one if one or more of the indicators were present. An overall index of sexual health problems ranged from 0 to 3.

Findings

Comparing Thirty Day Drinkers and Nondrinkers

We compared drinkers and nondrinkers in order to identify any significant differences between them. Nondrinkers are spread equally across all age groups. Thirty day drinkers are somewhat older (52% are aged 25 and over). Mean age of initiation of alcohol use is 19 and the range is from 12 to 26 (with 16 respondents between 27 and 28 years and 14 under the age of 12). Among nondrinkers, more than half are unmarried, while among thirty day drinkers, approximately 60% are married and 2/3 of them are living with their wives. Thirty day drinkers have less education than non-drinkers (35% of drinkers have had primary school education or less, versus only 22% for nondrinkers and for completion of high school for nondrinkers the percentage doubles (18% compared to 39%). Significantly more loaders and distance drivers (occupations in which more males are at risk for unprotected sex with multiple partners) are in the thirty day drinking group and fewer factory workers, compared to the nondrinking group. More Muslims are in the nondrinking group. There is no difference between Muslims and Hindus in standard of living. Most respondents were from Maharashtra or Uttar Pradesh (a northern state) in both categories, but more men from

Maharashtra (a high HIV prevalence state which produces wine) reported thirty day drinking, and fewer men from UP. From the other primary outsourcing states, Karnataka/ Andhra Pradesh (high HIV prevalence and alcohol consuming states) and Bihar/ Chhattisgarh (both underdeveloped north/central states) the percentage of thirty day drinkers was double that of nondrinkers. Finally over 60% of thirty day drinkers were born in Mumbai or had resided there for 10 years or more versus only 41% among non-drinkers. Thus there are some important differences between thirty day drinkers, most of whom drink several times a month or more, and nondrinkers, most of whom have never touched alcohol in the course of their lives.

Correlates and Predictors of Alcohol Consumption and Sexual Risk

To establish the nature and strengths of relationship between the variables included in the model, the paper uses bivariate analysis, binary logistic regression and multinomial logistic regression. Multinomial logistic regression analysis is the most appropriate technique in a situation where the dependent variable is categorical and has more than two outcomes.² Table 1 presents the association between alcohol consumption (measured as level of drinking in the past Thirty days) and selected independent variables. In the GLM, adjusted effects for each predictor control for the effect of all the others on the dependent variable. Respondents group unevenly. Most (almost 80%) are low level drinkers, 15% moderate level drinkers and only 4.4% are high level drinkers (3 or more times in a week, and three or more drinks at a sitting). Level of drinking does not differ significantly across education levels. High level drinkers are 2–3 times more likely to be older; are somewhat more likely to be rock breakers or drivers; are more likely to originate from Karnataka/Andhra Pradesh (southern states) and UP; somewhat more likely to be born in Mumbai; are more likely to be married and living with their wives; are four times more likely to have been exposed to alcohol in childhood; are more likely to experience social influence to drink; and are four times more likely to be involved in three or more risk-associated leisure time activities with peers.

Disposable income as a result of employment increases capacity for purchase of alcohol and attendance at parties. In indepth interviews, men have noted that their alcohol consumption increases when they are employed Hard labor constitutes a reason for drinking. As a factory laborer mentioned: “*When we drink alcohol then due to alcohol energy we can load vast size of iron piece on machine*” (Male, age–26). Drinking after hard work is also justified for relaxation and “*getting rid of physical exhaustion*”.

²The model permits the study of the effect of a unit change in the independent variable on the dependent variable considering the simultaneous effects of several variables. A multinomial logistic regression model is a generalization of binary (or logistic) regression model. In the binary model, a binary outcome (0 or 1) of events is modeled. If p is the probability of outcome being one, then (as explained above) the model specifies $\ln [p/(1 - p)] = \sum_k \beta_k x_k$. In the multinomial model, multinomial outcome 0, 1, 2...j of an event is

modeled. If p_j is the probability of outcome j , then the model specifies, $\ln \left[\frac{p_j}{p_J} \right] = \sum_k \beta_{jk} x_k$ where $J = 1, 2, \dots, j - 1$. Using the condition $p_j = 1$ and setting $\beta_{jk} = 0$, the above model determine the coefficients of β_{jk} unequally. Thus the model can be used to estimate the effect of variable x_k on the probability of outcome J .

Sexual Safety and Sexual Risk

Indicators of sexual risk include one predictor variable—condom knowledge/beliefs, and two outcome variables—type of partner in the past 12 months, and condom use during last sexual encounter.

Grouping by partner type, three of ten thirty day drinkers had no sexual partner in the past 12 months prior to the survey; 57% had sex only with their wives. Five percent had intercourse only with their girlfriends, and 8% had other, more potentially risky relationships with bar girls, commercial sex workers or casual female friends or neighbors. Younger men (under 20 years of age) had twice as many “other” partners as those 25 years of age and older and married. Still, more than 6% of this older and married group had sex with “other” partners. Unmarried men are 1.5 times more likely to have sexual intercourse with women other than their girlfriends than their married counterparts.

Table 2 shows that occupation, leisure time activities and childhood exposure to alcohol and level of drinking are additional significant predictors of type of sexual partners of thirty day drinkers in the prior 12 months. Long distance driving, three or more activities with friends, high level of drinking and high positive alcohol and sexual expectancies were associated with significant probability of “other” partners. Men who engage in three or more risk related activities with friends are nearly six times more likely to have relationships with women other than their intimate partners. Even though the *N* is small, men in the high level drinking group were more than five times more likely to have “other” sexual partners in the past 12 months.

Table 3 presents the association of pro-risky condom knowledge/beliefs and attitudes toward condom use with predictor and outcome variables. First, only a small proportion of men in the study had high pro-risk knowledge/beliefs regarding condom use (3%). Age, and marital status of respondents are not associated with condom knowledge/beliefs but educational attainment, and partner type (girlfriend or “other”) are predictors of positive attitudes toward condom use. On the other hand, moderate level of drinking is a predictor of pro-risk attitudes toward condom use. These findings are further reinforced through the logistic regression odds ratios presented in the last column of Table 4.

Table 4 represents the logistic regression odds ratios of study participants’ condom use in last sexual intercourse. Because risk contexts and behaviors differ by marital status, we have conducted parallel analyses for married and unmarried men. The table shows that the adjusted effect of respondent’s age is not significant in explaining the variability in condom use in the last sexual encounter irrespective of marital status or type of partner. However, married men who report experiencing higher levels of social influence or pressure to engage in alcohol and sexual risk behaviors are 1.2 times more likely to use a condom in their last sexual encounter after adjusting for the effects of other predictors. These men may be more heavily influenced by their male friends to drink and have sex with non-spousal partners, but these same peers may also convince their peers to take protective measures including the use of a condom with partners other than their wives. Further “other partners” of married men are more likely to be female sex workers who require condom use. The adjusted effects of level of drinking on condom use in the last sexual encounter show that moderate level of

drinking predicts non-condom use (OR = 0.24, $p < 0.05$) for unmarried men but not for married men. Type of last sexual partner has emerged as the strongest predictor of condom use at last sexual intercourse with a partner other than wife or girlfriend. Both married and unmarried men are over fourteen times more likely to use a condom in their last sexual encounter with such partners.

Finally, the adjusted effects of condom knowledge/beliefs, a variable measuring pro-risk views of condom use show that unmarried men have moderately pro-risk knowledge and beliefs about condom use, but are not likely to use condoms at last sex. Young unmarried men in the study community find it difficult to translate their knowledge and attitudes about condoms into safe sexual practices which has significant implications for intervention development.

Factors Affecting Sexual Health Problems

A number of Indian researchers have reported that sexual health problems are related to sexual risk [47, 50, 51, 53, 55]. These sexual health problems are referred to in Hindi as *gupt rog* include *dhat* (quality and quantity of semen, early ejaculation, semen loss through masturbation), *Kamjori* (weakness and inability to maintain an erection) and *Garmi* (sores on the genitals). Verma et al [53] note that “*Garmi* is a generic term used to imply inner body heat, which manifests itself in the form of boils, sores, small-fistulas and so on around genital area”. The symptoms resemble those of STIs, but in an effort to examine the relationship, Schensul et al. have attempted to link reports of *garmi* to laboratory reports of a number of STIs, and have found no association [64]. *Garmi* may be a symptom of sexual desire or illicit relationships and is linked to the consumption of “hot” foods such as meat and to alcohol consumption. Sexual health problems appear in marriages that are experiencing economic, health or alcohol-related difficulties. Thus concern over sexual health problems has been hypothesized to be an indicator of marital problems contributing to extra-marital relationships and sex with multiple partners.

Many thirty day drinkers reported masturbation (70%) as a sexual health problem. Twenty-five percent reported at least one symptom of *garmi*, and only 4% reported suffering from *kamjori*. There is little variation across marital, age and other grouping variables in prevalence of sexual health problems. Neither age, marital status, nor condom use at last intercourse is related to sexual health problems. However, occupation (driver), number of leisure time activities, type of sexual partners in the last 12 months, hypermasculinity, pro-risky condom and sex attitude, condom use at last sex, and level of drinking all predict sexual health problems, primarily *garmi*.

Table 5 shows that after adjusting for other characteristics included in the multinomial logistic model being unmarried, having a wife only as sexual partner, and using condom at last intercourse are the primary predictors of *garmi*. Married men may be concerned about their marital relationships which they express in the form of symptoms of *garmi*; and unmarried men may be using condoms because of their involvement in transactional sex, leading to concerns about *garmi*.

Discussion

In this study we focused on younger married and unmarried men who consumed alcohol at least once in the past 30 days. Drinkers were more likely than nondrinkers to be less educated, to have less income, to be born in Mumbai or long term residents and to be from Maharashtra and from underdeveloped northern states (Bihar, Chhattisgarh). Most of the sample consisted of low level drinkers, drinking not more than once a week and not more than 1–2 drinks at a sitting. Mean thirty day ml. of alcohol consumed was approximately 230 and less than 5% of drinkers, drank over 1000 ml. a month, well below the 2005 national average of about 2800 cited by Benegal [2]. When drinkers were divided into low, moderate and high level drinkers (by frequency and amount of drinks consumed in a sitting), however, the mean difference in consumption of pure alcohol across groups was highly significant.

Within this general population of young male drinkers, there is a smaller group of men who are older (25 and above) and involved in more activities that are associated with sexual risk and subject to influence from their friends to drink. With mean age of marriage at 20, many of these men are married. Efforts to reduce alcohol consumption should focus on the development of screening tools that assess marital status, alcohol consumption frequency and amount, and level of involvement with peers in risk-related activities. Our study, like others, shows that long distance mobile workers, mainly drivers, are at higher risk of both alcohol consumption and transactional sex. Most interventions to reduce HIV infection focus on long distance truckers. The drivers in our study are short distance small truckers or transporters who are not reached by such interventions and should be a focal point for secondary interventions with more localized smaller scale transporters.

Level of childhood drinking exposure predicts amount of alcohol consumed which in turn is related to number of non-exclusive (neither wife nor girlfriend only) sexual partners. Many married men consume alcohol at home where they are easily observed by their children. Thus male or couples interventions to reduce alcohol consumption especially in the presence of children would be beneficial in the long run. Condom attitudes are more positive among unmarried men although there is a pattern of use of condoms with brothel-based sex workers that cuts across marital status as well as age. Though alcohol may have an effect on unsafe sex, it is overridden by the clear cultural norm that condoms should be used with a female sex worker or casual female partners. The majority of non intimate female partners are female sex workers; the apparent shift to condom use with these partners, may be the result of AIDS prevention intervention in the study communities which have focused mainly on female sex workers. The net effect of these interventions thus seems to be to convince men that they should use protection with women with whom they have transactional sex.

But married men have intimate relationships with other women (neighbors, girlfriends) with whom they also do not use condoms. These new condom use norms and practices do not extend to neighbors, girlfriends of married men, and other non FSW sexual partners who are fewer in number but with whom condoms are rarely if ever used. Thus considerable work remains to be done to convince men with non-transactional relationships outside of marriage to use condoms despite strong feelings of trust and intimacy with their partners.

Some other female partners are women encountered in bars in which sexuality is used to market alcohol. Closing these bars or removing women dancers and servers from “ladies” or “dance” bars, has so far not reduced access to informal transactional sex which is a source of income for impoverished households, nor does it reduce alcohol consumption. Thus other approaches are required to ensure that as in the formal sexual service sector, condoms are required regardless of alcohol use, such as requiring condom use in establishments connected to ladies’ or dance bars (now condoms can be purchased but use is voluntary, or addressing sources of marital tension to prevent men’s search for outside sexual partners.

Alcohol and sexual expectations are associated with both higher levels of alcohol consumption and sexual risk indicators. Thus interventions should address social norms and beliefs surrounding alcohol use at the individual, group or peer and community levels. *Garmi* should be viewed as an indicator of sexual risk and addressed through prevention education, even if it is treated as a symptom of STD.

It is gratifying to note that both levels of alcohol consumption and levels of sexual risk behavior are low in this general population of young men. It appears that interventions designed to reduce risk of HIV transmission through consistent use of condoms among brothel based FSWs and clients have been quite successful. This success does not apply with respect to the informal sexual service trade, where men’s perceptions of intimacy, women’s economic needs and disempowerment, general negative attitudes toward condom use and lack of social norms governing mutual protection or abstinence all enhance risk exposure. In these settings, the disinhibiting effects of alcohol coupled with positive expectations that it will enhance the sexual experience, do contribute to the risk of misuse or nonuse of protection, or the intent to engage in sex with women who are not in a position to insist on it. Further attention should be given to the enhancement of women’s economic status, and norms based interventions that promote condom use for sexual protection outside of marriage for both men and women.

Limitations

The data for this paper were collected from a representative sample of thirty day drinkers. The sample of nondrinkers was drawn from households in which the first age-eligible man was screened as a nondrinker. Thus, it may not be fully representative of nondrinkers in the study communities. Levels of alcohol use and sexual risk are somewhat lower than reported from similar communities in Western Mumbai, despite both drinking and sexual opportunity structures in the study area. This may be explained partially by the locations from which residents have migrated, which vary in alcohol consumption. During the study period, the municipal government closed dance bars in commercial districts near the study area, limiting access to more informal commercial sex transactions. This could have affected the level of such activities during the time of the study. Despite these limitations the associations among selected predictors, alcohol consumption, and sexual risk related to HIV transmission, and sexual health problems are clear, and call for continued vigilance, monitoring and intervention in low prevalence communities with low levels of risk behavior.

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Table 1

Level of drinking and selected socio-demographic characteristics

Background characteristics	Levels of drinking				Test of association		Result of logistic regression Odds ratios
	Low	Moderate	High	Total	Chi-square	P-value	
Age							
20 and below	88.2	9.3	2.5	161			
21–24	82.6	13.5	3.8	340	10.7	0.030	1.799**
25 and over	77.3	17.4	5.3	547			2.807***
Marital status							
Married lives with wife	77.3	17.4	5.3	431			
Married lives away from wife	88.5	11.4	2.7	219	7.4	0.115	0.737
Unmarried	81.7	14.1	4.3	398			0.924
Educational qualification							
Illiterate or primary	77.3	18.7	4.0	374			
Middle school	81.7	13.8	4.6	480			0.749
High school & above	85.1	10.3	4.6	194	8.1	0.089	0.667
Occupation							
Rock breaking/construction	75.0	17.9	7.1	140			
Driver	73.5	19.9	6.6	211	17.0	0.009	0.975
Contract/self home	86.6	10.4	3.0	67			0.488
Factory workers and others	83.8	13.0	3.2	630			0.629
Religion							
Hindu	81.2	15.1	3.7	861			
Muslim	82.1	9.5	8.4	95	8.5	0.076	0.912
Buddhist/Others	75.0	18.5	6.5	92			1.230
Place of origin							
Bihar/Chhattisgarh	77.5	19.1	3.4	89			
Karnataka/Andhra Pradesh	69.1	20.9	10.0	110			
Maharashtra	78.2	16.9	4.9	427	27.3	0.001	1.682
Uttar Pradesh	87.6	10.2	2.2	362			1.759
Others	83.3	11.7	5.0	60			1.000

Background characteristics	Levels of drinking			Test of association		Result of logistic regression Odds ratios
	Low	Moderate	High	Chi-square	P-value	
Duration of stay						
Born in Mumbai	75.9	15.8	8.3	336		0.851
From last 4 years	84.6	14.3	1.1	182	20.6	0.002
From last 5–9 years	83.0	14.3	2.7	224		0.859
From last 10 years and above	82.0	14.7	3.3	306		0.827
Leisure time activity						
No activity	90.7	8.6	0.6	162		
One or two activities	83.1	14.1	2.8	568	39.5	0.000
Three or more activities	71.4	19.5	9.1	318		2.139**
Childhood exposure to alcohol						3.947***
Low	88.5	8.0	3.5	401		
Moderate	77.2	17.9	5.0	605	40.7	0.000
High	56.1	39.0	4.9	41		1.986**
Social influence to engage in alcohol						3.838***
Low	85.9	11.5	2.6	384		
Moderate	81.4	15.8	2.8	355	25.0	0.000
High	73.5	18.1	8.4	309		1.072
Total	80.7	14.9	4.4	1048		1.442

Note:

*** $P < 0.01$,

** $P < 0.05$ and

* $P < 0.10$, First category of each predictor has been taken as a reference category for application of logistic regression

Table 2

Correlates of sex with partner types in past 12 months

Background Characteristics	Type of partner				Total	Test of association	
	None	Wife only	Girl friend only	Others		Chi-square	P-value
Age							
20 and below	67.3	8.3	14.3	10.1	168		
21-24	41.3	43.1	7.2	8.4	346	326.1	0.000
25 and over	12.4	79.7	1.6	6.3	558		
Marital status							
Married lives with wife	0.9	92.3	0.0	6.8	440		
Married lives away from wife	3.6	90.2	0.0	6.3	224	938.2	0.000
Unmarried	76.7	0.0	14.2	9.1	408		
Educational qualification							
Illiterate or primary	28.2	59.4	4.0	8.4	379		
Middle school	28.2	59.2	5.5	7.1	493	16.9	0.010
High school and above	39.5	45.5	8.0	7.0	200		
Occupation							
Rock breaker/construction	25.5	66.7	2.1	5.7	141		
Driver	22.9	60.3	6.5	10.3	214	28.2	0.001
Contract/self home	17.1	70.0	5.7	7.1	70		
Factory workers and others	35.2	51.9	5.7	7.1	647		
Leisure time activity							
No activity	20.0	76.5	1.2	2.4	170		
One or two activity	31.8	61.6	3.3	3.3	584	144.8	0.000
Three or more activities	33.0	37.1	11.6	18.2	318		
Hyper masculinity							
Low	31.3	54.7	6.3	7.7	364		
Moderate	26.9	62.5	3.7	6.8	427	11.1	0.087
High	33.6	51.3	6.6	8.5	271		
Alcohol and sexual expectancy							
Low	31.8	58.2	5.7	4.2	261		

Background Characteristics	Type of partner				Test of association		
	None	Wife only	Girl friend only	Others	Total	Chi-square	P-value
Moderate	31.7	56.2	4.2	7.9	404	13.6	0.035
High	24.3	58.9	6.7	10.1	358		
Level of drinking							
Low	32.6	57.0	4.5	5.9	846		
Moderate	22.4	57.7	9.6	10.3	156	60.1	0.000
High	10.9	47.8	8.7	32.6	46		
Total	30.3	56.7	5.4	7.6	1072		

Table 3

Predictors of condom attitudes among thirty day drinkers

Background characteristics	Condom attitudes			Test of association		Result of logistic regression Odds ratios
	Higher positive attitudes	Moderate positive attitudes	Low Positive Attitudes	Chi-square	P-value	
Age						
20 and below	28.1	69.5	2.4			1.057
21-24	28.1	69.6	2.3	1.0	0.912	1.169
25 and over	26.1	70.9	3.1			
Marital status						
Married lives wife	28.1	69.6	2.3			
Married lives away from wife	26.9	70.0	3.1	1.0	0.922	0.959
Unmarried	26.0	71.0	2.9			1.769
Educational qualification						
Illiterate or primary	28.1	68.7	3.2			
Middle school	28.7	68.8	2.4	5.2	0.266	1.140
High school and above	21.2	76.5	2.5			2.101*
Leisure time activity						
No activity	23.1	72.8	4.1			
One or two activity	23.8	73.3	2.9	17.2	0.002	1.029
Three or more activities	35.2	63.2	1.6			0.752
Alcohol and sexual expectancy						
Low	18.0	80.5	1.5			
Moderate	25.1	72.1	2.7	33.0	0.000	0.575**
High	37.4	59.8	2.8			0.328***
Hyper masculinity						
Low	21.2	75.5	3.3			
Moderate	28.9	67.5	3.5	15.9	0.003	0.737
High	32.5	66.8	0.7			0.711
Level of drinking						
Low	26.4	70.4	3.2			
Moderate	24.4	75.0	0.6	16.4	0.002	1.573*

Background characteristics	Condom attitudes			Test of association		Result of logistic regression Odds ratios
	Higher positive attitudes	Moderate positive attitudes	Low Positive Attitudes	Chi-square	P-value	
High	50.0	47.8	2.2	46		0.608
Type of partner (critical event)						
Wife only	27.3	69.9	2.8	579		
Girl friend only	41.9	58.1	0.0	86	21.2	0.425**
Others	65.0	35.0	0.0	20		0.188*
Total	27.1	70.2	2.7	1068		

Note:

*** $P < 0.01$,

** $P < 0.05$ and

* $P < 0.10$. First category of each predictor has been taken as a reference category for application of logistic regression

Table 4

Condom use during most recent sexual encounter among 30 day drinkers

Background characteristics	Married		Unmarried	
	Standard error	Exp(β)	Standard error	Exp(β)
Age				
18–24 [®]				
25 and over	0.384	1.435	0.800	0.292
Educational qualification				
Illiterate or primary [®]				
Middle school	0.382	1.504	0.651	1.263
High school and above	0.491	1.637	0.885	3.123
Leisure time activity				
No activity [®]				
One or two activity	0.451	0.574	1.775	2.222
Three or more activities	0.508	0.949	1.734	3.884
Social influence to engage in alcohol use and sexual risk	0.083	1.228**	0.144	0.900
Hyper masculinity	0.105	0.878	0.153	0.805
Level of drinking				
Low [®]				
Moderate	0.428	1.168	0.735	0.239**
High	0.682	0.753	0.905	1.185
Type of partners				
Wife/Girlfriend [®]				
Others	0.404	14.797***	0.782	14.603***
Condom attitudes				
High positive attitudes [®]				
Moderately positive attitudes	0.365	0.946	0.615	0.230**
Low positive attitudes	1.140	0.832	nc	nc

*Note:****
 $P < 0.01$,**
 $P < 0.05$ and*
 $P < 0.10$;[®] Reference category; nc, Too few case for interpretation of odds ratios

Table 5

Predictors of sexual health problems in past 12 months

Background characteristics	Dhat	Kamjori	Garmi
Age			
20 and below	74.7	5.0	20.3
21–24	73.5	4.0	22.5
25 and over	72.4	1.9	25.6
Marital status			
Married lives with wife	76.4	4.6	19.0
Married lives away from wife	76.6	4.5	19.0
Unmarried	65.7	1.3	33.0
Occupation			
Rock breaker/loader/construction	78.7	3.8	17.5
Driver	70.0	1.6	28.4**
Contract/self home	73.6	1.7	24.8
Factory workers and others	72.8	3.4	23.8
Leisure time activity			
No activity	73.4	6.0	20.7
One or two activity	76.0	1.9**	22.0
Three or more activities	67.7	3.9	28.4
Level of drinking			
Low	72.4	2.1	25.5
Moderate	76.2	2.9	20.9
High	72.4	3.5	24.1
Type of partner			
None	80.6	5.6	13.9
Wife only	65.5	2.4	32.1**
Girl friend only	84.1	2.2	13.7
All others	76.9	0.6	22.4
Condom attitudes			
Positive attitudes	70.4	3.4	26.2
Moderately positive attitudes	74.4	2.5	23.1
Low positive attitudes	66.6	16.8**	16.5
Condom use in last sex			
No	75.0	2.7	22.3
Yes	58.4	4.2	37.4**

*Note:**** $P < 0.01$,** $P < 0.05$ and* $P < 0.10$