Gender and the risk of HIV in North India: Couple communication as a protective factor[1]

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Paper presented at the XXV IUSSP International Population Conference
Tours, France, July 2005

[1] This research was funded through a grant from the NICHD.

Background

Since HIV was first detected in India in 1986 (Simoes et al. 1993), the AIDS epidemic has spread rapidly there. HIV entered into the general population in India by the early 1990s (Solomon et al. 1998). A host of factors contribute to India's vulnerability to the AIDS epidemic, including pervasive poverty, low levels of education, and high gender stratification. Women particularly are at risk for infection due to their low status relative to men in terms of education, paid employment, and individual autonomy (Hawkes & Santhya 2002). This applies even more so in the north-central part of the country, where socio-economic and health outcomes are worse than the rest of the country. In addition, women in North India are generally less empowered than those living in the southern regions. Many studies in India have found that the majority of married women who are HIV positive have been infected by having unprotected sex with their husbands. This was observed in urban and rural Tamil Nadu (Solomon, Kumarasamy, Ganesh, & Amalraj 1998), Pune, Maharashtra (Gangakhedkar et al. 1997), Chennai, Tamil Nadu (Newmann et al. 2000) and in Northeast India (George et al. 1997). This pattern is indicative of women's lack of power to protect themselves from their husband's risky sexual activity

Strict social norms around sexual activity, both within but particularly outside of marriage, have created difficulties in conducting research related to HIV and other sexually transmitted infections (STIs) in India. It was thought that sexual activity outside marriage was rare. Research during the last ten years, however, has shown that a significant proportion of men in India report both premarital and extra marital sexual activity. A recent study of 2,901 men aged 18-40 years old living in rural districts of five states found that 15.3% to 47.3% of men reported premarital sex, and 6.3% to 37.4% of men reported extra marital sex (Verma & Lhungdim 2004).

Even though non-marital sexual activity is not openly condoned for either sex, men have considerably more freedom than women in this sphere for a variety of reasons. From a very young age, males have much greater freedom of movement outside the household than females. This social pattern ranges from travelling outside of one's home village or city, to daily social interactions: women stay closer to home and their neighbourhoods than men. In addition, there are several barriers to condom use within marriage. On the one hand, condoms are associated with contraception in India since they have been part of the family planning program messages since the 1960s. Yet, the vast majority of contracepting couples in India rely on female sterilization. Condom use is also associated commercial sex work in India, again mainly to prevent pregnancy. These beliefs contribute to the very low rate of condom use among married couples in India (Bhattacharya 2004).

Women's empowerment in India, while varying between regions, is generally low. Studies examining factors that influence reproductive health outcomes such as the use of contraceptives and maternal health care have found that the level of women's autonomy is positively associated with better outcomes, even when controlling for confounding factors such as education and economic status (Bloom, Wypij, & Das Gupta 2001;Jejeebhoy 1997). In areas where women's empowerment is low, their risk of becoming infected with HIV from their male partners is heightened, given their lack of ability to negotiate safer sex. The norms around men's and women's societal and family roles, sexual negotiation and condom use along with the general lack of knowledge about HIV and STIs leave married women in India particularly vulnerable to these infections (Solomon et al. 2003). While studies have begun to document non-marital sexual activity among men in India, little is understood about its patterns and determinants. There have been no surveys of married couples designed to study these issues in India.

In relationships where men have a more egalitarian relationship with their wives, they may be less likely to engage in the risky sexual behaviors that leave their wives vulnerable to HIV and other STIs. Using data from a population-based survey conducted among couples living in the North Indian states of Uttaranchal and Uttar Pradesh, this study investigates the

relationship between spousal communication and the likelihood of husbands engaging in non-marital sex. Differentials in AIDS-related knowledge between married men and women and levels of men's reported non-marital sexual activity are described. Factors associated with two types of non-marital sexual activity—any extra-marital sex during the past year and payment for sexual activity in the past year—are explored. Women's empowerment within marriage is indicated by the frequency of conversation between couples on issues ranging from problems within the household and happenings in the wider community. Couples with better communication exemplify relationships which women are likely to have higher empowerment, indicating a more egalitarian spousal relationship than couples with less communication. The association between women's empowerment within marriage and the likelihood of men engaging in either type of non-marital sex during the last year is tested while controlling for potential confounding factors.

Data and Methods

These analyses used data from the second phase of a study conducted by investigators from the University of North Carolina at Chapel Hill (UNC) in collaboration with researchers at Banaras Hindu University in Varanasi (BHU). The study was carried out in the North Indian states of Uttar Pradesh (UP) and Uttaranchal to describe the potential for the spread of HIV in this currently low prevalence area of the country. Funding was provided by the National Institute of Child Health and Human Development and the Institutional Review Boards of UNC and BHU approved the study protocol.

A survey was conducted from January-June 2002 in a probability sample of married couples residing in households in urban and rural areas of the 4 regions of UP and of the state of Uttaranchal. Together, the two states make up roughly 15% of the Indian population, at 150 million people. About 75 percent of the population resides in rural areas in this region (Government of India 2001). Compared with the rest of India, the states of UP, Uttaranchal and neighboring Bihar account for the lowest levels economic development as well as the worst population and health outcomes: fertility and mortality rates are higher than the rest of India, and levels of women's autonomy are lower (International Institute for Population Sciences & ORC Macro 2000).

The survey was designed to select two thirds of the sample households from urban areas, since the risk of HIV transmission in North India is presently higher there than in rural areas. Eligible urban households were selected from ten urban areas—the two largest cities in each of the four regions of UP (Bundelkund, Central, Eastern, and Western) and in Uttaranchal (formerly the Hill district of Uttar Pradesh), with populations ranging from 139,000 (Orai in Bundelkund region) to 2,556,000 (Kanpur Nagar in Central Region). The rural sample was drawn from five rural areas—one randomly selected district in each of the four regions of UP and Uttaranchal. The ward and block listings from the 2001 Census were used as the sampling frames to obtain a representative sample of the urban areas selected and rural regions of the states. All currently married women 15-49 living in selected households were eligible for interview; eligible men were these women's husbands. All respondents were interviewed individually in a private setting. The resulting sample size was 3387 couples; the household refusal rate was 4%.

The two outcome variables used to indicate husbands' risky sex were based on men's self-reports of sex with someone other than their wife, and paying for sex, during the year previous to the date of the survey. The information was derived from the partner series in the man's questionnaire. Two variables were used for couple communication: one was constructed from men's reports and the other from women's reports. Identical questions were asked of men and women about the type and frequency of conversations they had with their spouses in seven different subject areas: Events in the house/neighborhood, events in the world, feelings about daily life, problems that arise in the household, worries connected to children/other family

members, worries connected to the respondent, and when the respondent is involved in a dispute with other family members. Two scores—one for women, one for men—were calculated based on the frequency of conversations across all the questions, ranging from never (0) to a lot (5). The scores (ranging from 0-14) were then divided into low (0-6), moderate (7-10) and high (11-14) frequency of overall spousal communication from the wife's and husband's point of view.

Other factors examined include several indicators of AIDS-related knowledge and socio-demographic factors. A standard of living index was calculated based on the number of household possessions, using the protocol outlined in the National Family Health Survey 1998-99 (International Institute for Population Sciences & ORC Macro 2000). Age at the time of the survey was checked with given dates of birth. Education was based on the number of years completed in school. The use of alcohol and/or marijuana (eaten in the form of bhang) during the past two weeks was based on self-report. Individuals were classified as having symptoms of sexually transmitted infections if they reported having genital ulcers or discharge (in the case of women, discharge that is "not in your nature") in the past year. Men were classified as mobile if they spent one or more nights away from home during the past two weeks.

Stata Version 8 was used for the analyses. Results of statistical tests were based on robust estimates of variance. Descriptive analyses investigated differentials in AIDS knowledge between men and women and the factors associated with men's extramarital and paid sex during the past year. Logistic regression analyses were used to explore the association of couple communication on men's sexual behavior, modeling women's and men's reported communication separately. Four models were fit that controlled for urban residence, age, education, economic status, use of alcohol, reported symptoms of sexually transmitted infections, and men's mobility. For the two outcomes, one model tested the communication index based on men's reports, while the second used the index based on women's reports.

Results

By design, 66% of the couple sample lived in the large urban areas of UP and Uttaranchal. Table 1 shows the sample characteristics, along with risk factors for non-marital sexual activity among men. About a fifth of women were below age 25 compared with only 8% of men, reflecting the age difference between spouses in India, where husbands tend to be several years older than wives. Twice as many women (45.9%) than men (22.0%) had no schooling; the opposite was observed for 13 plus years of schooling (women=11.9%, men=20%). Less than one percent of women used alcohol or marijuana in the past two weeks, compared with 29.7% of men. A small proportion (13.8%) of men spent at least one night away from home recently, and only 5.6% reported a genital ulcer or discharge during the past year. More women reported lower levels of couple communication than men: about a third of women (34.1%) reported a low level and a quarter (24.2%) reported a high level, compared with 22.4% of men reporting a low level, and 29.5% reporting a high level.

Table 2 shows the gap between the proportion of men and women demonstrating knowledge about HIV and STIs. Only slightly more men (33.0%) than women (27.5%) had heard of STIs. Far less women demonstrated knowledge about AIDS. Only 57.7% of women compared with 81.3% of men had heard of AIDS. A smaller but still notable difference between men's and women's knowledge persisted in the two indicators of further knowledge among those who had heard of AIDS. Fewer women than men knew that anything could be done to reduce the risk of HIV transmission (68.7% and 80.2%, respectively) and that a healthy-looking person could be infected with the virus (64.1% and 74.2%, respectively).

Men's sexual behavior and its correlates were explored in Tables 3 and 4. About one quarter of men (24.2%) reported that they had premarital sex. The proportions reporting the two types of recent non-marital sex were much smaller. Only 7.1% of men said they had slept with someone other than their wife in the past year, and 2.2% said they had paid for sex in the same period (Table 3). The patterns of the two different non-marital sexual activity by socio-

demographic and risk factors were somewhat similar (Table 4). The youngest men reported the most non-marital sex (9.4%) overall, but few of these reported paying for sex during the last year. The most common age group for paid sex was 25-40 year olds. More of the less educated men and those living at the low and medium standard of living indexes tended to report both types of risky sexual activity.

The most substantial differentials for both types of sex were noted between men who recently used alcohol/bhang (marijuana), had spent the night elsewhere, or had reported a genital ulcer/discharge in the last year (Table 4). More than twice the proportion of men who used these substances reported any non-marital sex compared with those who did not use them. Larger proportions of mobile men reported both types of non-marital sex, but in the case of paid sex, the proportion was almost four times as great. Similar differentials were observed for those men reporting symptoms of STIs compared with those who did not. The largest proportions of men reporting both types of risky sex in the past year were those who also reported STI symptoms in the same times period.

The frequency of couple communication as reported by both women and men was related to men's reports non-marital sex. Fewer men in marriages with the highest frequency of communication reported non-marital sex, compared with those in marriages with low levels of communication. The differences based on levels of communication were larger for men's reports than for women's in both types of non-marital sex. Three times the proportion of men (12.0%) with a low index of communication compared with those with a high index (4.1%) reported a non-martial partner in the past year, based on their own estimation of communication frequency. A notable difference was also observed based on wives' reports of communication frequency (8.0% of men with a low index reporting non-marital sex versus 4.7% with a high index). For paid sex, the levels were lower but the differences were similar: over three times as many men with a low index (3.3%) versus those with a high index (0.8%) reported having paid for sex, based on their own reports of communication frequency. The biggest differences observed according to women's reports were between men with a medium (2.8% of men paying for sex) versus a high index (1.8% of men) of communication.

Table 5 shows the odds ratios from four logistic regression models fit to examine the effect of couple communication on the risk of non-marital sex among husbands, while controlling for all the other factors in the model, which are known to be associated with risky sexual behavior. Models 1 and 3 examine the effect of couple communication as reported by men on the two outcomes of interest, while models 2 and 4 investigate the effect as reported by women. The results of the pairs of models for each of the outcomes are very similar, but some differences persisted between the likelihood of any non-marital sex and paid sex.

Models 1 and 2 show that the men most likely to report non-marital sex in the last year were aged 18-24, had no schooling, recently used alcohol or marijuana, spent one or more nights away from home in the last two weeks, and reported a genital ulcer/discharge. A higher odds of engaging in non-marital sex was observed for men living in urban areas and in households with lower economic status, but the associations were not statistically significant after controlling for the other factors in the models. Frequent communication between couples demonstrated a protective effect in both models. Men with low indexes of spousal communication had an estimated odds of reporting recent non-marital sex that was over two times higher (OR=2.13, 95% CI=1.41-3.21) than those with a high index. The effect of couple communication as reported by women was less strong (OR=1.56, 95% CI=1.05-2.39), but was still statistically significant.

Results were similar for the models (3 and 4) fit to examine factors influencing the probability that men had paid for sex in the past year. In these models, however, men living in urban areas were much more likely to report paying for sex in the past year, compared with those in rural areas, with an estimated odds of about four times higher for both types of sex (OR=4.13, 95% CI=1.92-8.87 for any non-marital sex, OR=4.15, 95% CI=1.92-8.98 for paid sex).

Otherwise, men who were 25-30 years old, those with little or no schooling, those who recently used alcohol/marijuana, and those reporting symptoms of sexually transmitted infection were most likely to have paid for sex in the past year.

Once again, the frequency of couple communication as reported by both men and women demonstrated a protective, statistically significant effect on the likelihood of reporting paid sex during the past year, with the effects slightly more pronounced than for any non-marital sex There was a more distinct difference between men with medium indexes and low indexes of communication as reported by women in this model than for reporting any non-marital sex in the past year. Also, the high category, as reported by women, was not statistically significant in these models. Part of this effect may be due to the small numbers of men reporting paid sex in the past year (n=73 men).

Discussion

These data demonstrate that women's empowerment—as indicated by the frequency of communication between spouses reported by both husbands and wives—acts as a protective factor for risky sexual behavior among married men in UP and Uttaranchal. These results concur with other studies conducted in India which found that an increased level of women's autonomy is positively associated with a number of reproductive health outcomes there (Dharmalingam & Morgan 1996;Jejeebhoy 1991;Rani & Bonu 2003). Spousal communication about the ordinary matters measured in this study may translate into greater trust between couples and a stronger position from which women can negotiate their lives. This, in turn may serve to attenuate the negative effects of gender stratification in India and elsewhere. This observation is especially pertinent to married women's risk of HIV infection in India, where the mode of transmission in most cases has been traced to women's husbands (Newmann, Sarin, Kumarasamy, Amalraj, Rogers, Madhivanan, Flanigan, Cu-Uvin, McGarvey, Mayer, & Solomon 2000;Solomon, Kumarasamy, Ganesh, & Amalraj 1998).

Although there were differences between in the magnitude of the effect of spousal communication based on men's and women's assessments of its frequency, the direction was the same in both models and reached statistical significance. Part of the effect of the indexes based on men's answers may be due to a reporting bias: the same men who tend to report better communication with their wife may be less likely to report non-marital sexual behavior. In essence, they may be more likely to report what may be viewed as "better" by researchers. Certainly, the level of non-marital sexual activity reported in the survey is an underestimate. A review of surveys found that reports of sexual behavior are inconsistent in some countries (Curtis & Sutherland Elizabeth G 2004). In India, where non-marital sexual activity is unacceptable to cultural norms, it is likely that such behavior is underreported. For the same reason, some correlations—such as those observed between levels of non-marital sexual behavior and education or economic status—should be interpreted with caution, since better educated men may be less forthcoming in reporting behavior judged as "bad" in cultural terms. However, despite these potential problems with the data, women's reports of spousal communication were independent of men's reported sexual behavior since wives were unaware of how their husbands responded to the survey. The other associations with risky sexual behavior observed among these men—higher levels of mobility, substance use and reported symptoms of sexually transmitted infections—concur with studies from around the world on individual risk factors for HIV infection.

Women in this area were also observed to be at a disadvantage in their knowledge and awareness of HIV infection as compared with men, who reported such knowledge in much larger numbers. This may also indicate that women are primarily unaware of the potential risks they face. This means that even when women are aware that their husbands are engaging in extramarital sex, they may not know that they are facing any risks associated with that behavior. At the moment, little is being done in India to actively prevent the spread of HIV. IEC campaigns

are failing to reach people in UP, Uttaranchal and Bihar, where levels of AIDS-related knowledge among married women is very low (International Institute for Population Sciences & ORC Macro 2000). Recognizing that the levels of reported non-martial sexual activity are low, this study confirmed that a sizeable proportion married women are exposed to the risk of HIV/STI transmission vis-à-vis their husbands' behavior. There is much that needs to be done to prevent the steady spread of HIV in India. However, the importance of including a gender-based approach to these activities in India cannot be underestimated.

Tables

Table 1. Descriptive characteristics of couples and risk factors for non-marital sexual behavior among men living in Uttar Pradesh and Uttaranchal, India (n=3387 couples).

Characteristic	Women		Men	
	n	%	n	%
Age of respondent				
15-24	740	21.8	276	8.1
25-30	944	27.9	730	21.6
31-40	1232	36.4	1328	39.2
41+	471	13.9	1053	31.1
Completed years of schooling				
None	1554	45.9	744	22.0
8	833	24.6	876	25.8
12	597	17.6	1090	32.2
13+	403	11.9	677	20.0
Household standard of living index				
Low	704	21.8	704	21.8
Medium	1754	51.8	1754	51.8
High	929	27.4	929	27.4
Used alcohol/marijuana past 2 weeks				
Yes	23	0.7	1007	29.7
No	3364	99.3	2380	70.3
Man spent 1+ night away past two weeks				
Yes			2921	13.8
No			466	86.2
Man reported gential discharge or ulcer				
Yes			189	5.6
No			3195	94.4
Reported level of couple communication				
Low	1156	34.1	760	22.4
Medium	1413	41.7	1627	48.1
High	818	24.2	1000	29.5

Table 2. Differentials in AIDS-related knowledge and attitudes between married men and women living in Uttar Pradesh and Uttaranchal, India (n=3387 couples).

Knowledge about AIDS	Women		Men	
	n	%	n	%
Has heard of sexually transmitted infections				
Yes	930	27.5	1118	33.0
No	2457	72.5	2269	67.0
Has heard of AIDS or HIV				
Yes	1956	57.7	2752	81.3
No	1431	42.3	635	18.7
Knows that risk of HIV can be reduced				
Yes	1344	68.7	2206	80.2
No	612	31.3	546	19.8
Knows healthy-looking person can be infected				
Yes	1253	64.1	2041	74.2
No	701	35.9	711	25.8

Table 3. Married men's non-marital sexual behavior in Uttar Pradesh Uttaranchal, India (n=3387 men).

Reported non-marital sexual behavior	Men n = 3387
Had premarital sex	
Yes	24.2
No	75.8
Had non-regular partner in past year	
Yes	7.1
No	92.9
Had paid sex in past year	
Yes	2.2
No	97.8

Table 4. Differentials in the proportion of men reporting risky sexual behavior by demographic factors and couple communication (n=3387).

		Extramarital sex in past year	Paid for sex in past year
Age of man			
	18-24	9.4	1.1
	25-30	7.7	2.9
	31-40	8.5	2.7
	41+	4.8	1.2
Completed years of schooling			
	None	10.4	3.5
	8	8.1	2.6
	12	6.1	1.6
	13+	3.7	1.0
Household standard of living index			
	Low	7.9	2.4
	Medium	7.9	2.2
	High	4.5	1.9
Used alcohol/marijuana past 2 weeks			
	Yes	12.1	4.0
	No	4.9	1.4
Man spent 1+ night away past two weeks			
	Yes	10.1	4.3
	No	6.6	1.2
Man reported gential discharge or ulcer			
	Yes	26.5	10.1
	No	5.9	1.7
Women's reported level of couple communication			
	Low	8.0	1.9
	Medium	7.7	2.8
	High	4.7	1.8
Men's reported level of couple communication			
	Low	12.0	3.3
	Medium	6.6	2.5
	High	4.1	0.8

Table 5. Odds ratios from logistic regression models for the likelihood of in men's risky sexual behavior, predicted by demographic factors and couple communication (n=3387).

		Extramarital sex in past year		Paid for sex in past year	
		Model 1	Model 2	Model 3	Model 4
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Residence					
	Urban	1.40 (0.98-2.00)	1.39 (0.97-1.99)	4.13 (1.92-8.87)	4.15 (1.92-8.98)
	Rural (ref)	1.0	1.0	1.0	1.0
Age of man					
	18-24	2.14 (1.25-3.63)	2.18 (1.28-3.70)	0.78 (0.20-2.76)	0.76 (0.21-2.81)
	25-30	1.68 (1.10-2.57)	1.70 (1.12-2.60)	2.05 (1.00-4.21)	2.09 (1.01-4.30)
	31-40	1.93 (1.33-2.79)	1.94 (1.34-2.81)	1.89 (0.98-3.64)	1.88 (0.98-3.62)
	41+ (ref)	1.0	1.0	1.0	1.0
Completed years of schooling					
	None	2.09 (1.20-3.62)	2.25 (1.30-3.89)	3.54 (1.30-9.65)	3.78 (1.40-10.23)
	8	1.56 (0.98-2.66)	1.66 (0.97-2.80)	2.48 (0.95-6.46)	2.65 (1.02-6.89)
	12	1.35 (0.82-2.25)	1.39 (0.84-2.30)	1.67 (0.66-4.23)	1.75 (0.69-4.42)
	13+ (ref)	1.0	1.0	1.0	1.0
Household standard of living index					
	Low	1.09 (0.62-1.89)	1.19 (0.69-2.08)	1.20 (0.49-3.04)	1.47 (0.59-3.67)
	Medium	1.95 (0.79-1.79)	1.21 (0.81-1.81)	0.75 (0.38-1.45)	0.78 (0.39-1.51)
	High (ref)	1.0	1.0	1.0	1.0
Used alcohol/marijuana past 2 weeks					
	Yes	2.23 (1.69-2.96)	2.37 (1.80-3.13)	2.39 (1.45-3.89)	2.50 (1.54-4.07)
	No (ref)	1.0	1.0	1.0	1.0
Man spent 1+ night away past two weeks					
	Yes	1.65 (1.16-2.35)	1.67 (1.17-2.38)	2.48 (1.43-4.30)	2.50 (1.44-4.34)
	No (ref)	1.0	1.0	1.0	1.0
Man reported gential discharge or ulcer					
	Yes	3.91 (2.68-5.69)	4.37 (3.01-6.33)	4.01 (2.23-7.20)	4.59 (2.57-8.20)
	No (ref)	1.0	1.0	1.0	1.0
Women's reported level of couple communication					
	Low		1.56 (1.05-2.39)		1.48 (0.69-3.16)
	Medium		1.67 (1.13-2.48)		2.20 (1.10-4.48)
	High (ref)		1.0		1.0
Men's reported level of couple communication					
	Low	2.13 (1.41-3.21)		2.64 (1.14-6.41)	
	Medium	1.41 (0.96-2.08)		2.52 (1.15-5.49)	
	High	1.0		1.0	

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