Published in final edited form as:

Int J STD AIDS. 2013 December ; 24(12): 957–968. doi:10.1177/0956462413488568.

Epidemiologic correlates of willingness to be tested for HIV and prior testing among married men in India

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Abstract

There has been limited research in India on determinants of seeking HIV testing by Indian married couples. We analyzed data obtained from husbands of married couples participating in the National Family Health Survey 2005–06. Socio-demographic and behavioural predictors for willingness to be tested and self-reported prior testing were explored, using multivariate logistic regression. Factor scores were used to summarize knowledge variables related to HIV prevention and places of testing. Sixty-nine percent of the husbands were willing to be tested as part of National Family Health Survey 2005–06, and 7% reported some form of prior testing. Our results indicate that knowledge about HIV testing in hospitals and other health/welfare centres, knowledge about transmission of HIV, poor education, religion, economic status, occupation, early sexual debut, and use of contraceptives other than barrier methods were significant predictors for reported willingness to be tested. Knowledge about routes of transmission of HIV, younger age, educational level, religion other than Hindu or Muslim, economic status, occupation, history of blood transfusion, and condom use were significant correlates of previously being tested. Strategies to improve knowledge about HIV testing sites and HIV prevention may encourage married men to be tested and reduce the spread of infection from them to their wives.

Keywords

HIV; AIDS; screening; HIV testing; India; married men; National Family Health Survey-3

Introduction

Testing for HIV antibodies is an important component of HIV prevention strategies and is also an important determinant of access to care by infected and at-risk populations.^{1–3} Increasing availability of antiretroviral therapy has considerably reduced risks of early death

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Conflict of interest

The authors declare no conflict of interest.

when detected early through testing.⁴ Early detection of HIV positivity has also been shown to modify HIV risk behaviours when it is accompanied with counseling.^{5,6} Effective early detection is an important first step towards reducing viral load and HIV transmission, and this can be achieved through widespread uptake of HIV testing.^{7,8} Finally, early testing has been shown to reduce the economic burden on health systems, both in developed and developing nations, regardless of HIV prevalence.⁸

India, despite having a low prevalence of HIV in the general population, has approximately 2.4 million HIV-infected citizens, 61% of whom are male.⁹ Men are considered the “driver” of the epidemic among married couples and are probably the only risk factor for the large proportion of women who are monogamous.^{9–12} Thus, interventions for increasing testing among married men may be instrumental in lowering adult HIV transmission rates, even if serostatus disclosure rates are low, by guiding infected men into treatment.^{11,13} Little research has been conducted to determine the correlates for seeking HIV testing among Indian married couples, especially willingness to be tested. Because of perceived low risk among married couples, a very low proportion are actually tested.^{12,14} Thus, finding the determinants of willingness to test among this population may help to formulate effective intervention strategies to prevent spread of HIV in the general population.

In the literature, a wide array of demographic, behavioural and societal factors have been identified that predict willingness to be tested. Globally, younger age, ethnicity, perceived risk and knowledge about HIV, education level, having a prior sexually transmitted infection (STI), and injection drug use have been reported to predict likelihood of getting tested.^{15–18} There has been conflicting information on high-risk behaviours (such as injection drug use and having commercial sex partners); some studies have found them to be significant predictors of testing, while others have reported them not to be.^{17,18} Knowledge about testing services, peer support, desire to get treated, perceived susceptibility, easier availability of testing, perception of risk and risk behaviours, and injection drug use have been reported to be positive determinants for getting tested, while negative associations were found for high-risk sexual activity and having multiple partners.^{17,19–21}

We explored factors associated with willingness to be tested and self-reported testing among married men in India by analyzing data from Indian National Family Health Survey-3 (NFHS-3), a nationally representative sample survey.

Methods

Study sample

We analyzed data from husbands of married couples who participated in NFHS-3, a nationally representative household-based survey conducted in 2005–2006 among women 15–49 and men 15–54 years of age across all 29 states of India. The systematic sampling technique used for the survey was multistage (two-stage for rural and three for urban) cluster sampling, as designed by the International Institute of Population Sciences (IIPS), Mumbai, India, and Macro International, Calverton, MD, USA. The survey was part of the Demographic and Health Surveys conducted in several countries.¹⁴ The Health Ministry

Screening Committee of the Ministry of Health, Government of India, and the ethics committees of the IIPS and Macro International approved the procedures of the NFHS-3.

For interviewing men, NFHS-3 used an eligibility criterion requiring that the men had stayed in their household the night before the interview. Along with collection of socio-demographic and behavioural data, blood samples for HIV testing were collected in 28 of the 29 states (excluding Nagaland). HIV testing was voluntary, and test samples were anonymised by the use of bar codes. Respondents who consented to be tested provided blood drops from a finger stick on special filter paper cards that were dried overnight. These samples were tested at a nationally accredited laboratory in Mumbai. Test results were not disclosed to the participants, and individuals consenting to the anonymous linked test procedure were given a voucher for free HIV testing from local clinics offering HIV counseling and testing services.¹⁴

Measures

Outcome

The two outcome variables were willingness to be tested for HIV and self-reported prior HIV testing (as response to: “Have you ever been tested for AIDS?”). In the absence of any survey question(s) regarding willingness to be tested, we decided to use the proportion of married men who agreed to be tested as a surrogate for indicator of willingness to be tested. Thus, the dependent variable for willingness to be tested was binary, indicating whether a blood specimen was collected in NFHS-3. This surrogate measure of willingness to be tested may differ from an interview-based estimate of intention to get tested, but that does not necessarily imply that this measure is a poor one. One study in China reported that indicating an intention to be tested is not a good predictor of those who actually get tested.²² Thus, if our public health goal refers to the proportion of married men who would actually get tested if they perceive themselves to be at risk, then our outcome measure may be quite valid, despite being a surrogate. The binary variable used for self-reported testing was response to being asked if tested. We could not differentiate whether the testing was initiated by the client or the provider.

Factors representing knowledge variables

We used two sets of knowledge variables, selected on the basis of a literature review, as important predictors in our analysis: (1) knowledge regarding “means of avoiding AIDS” and (2) knowledge about “places for HIV testing.”^{23–25} There were 18 possible responses, each coded as a separate variable, to questions on knowledge about means of avoiding AIDS, such as abstaining from sex, use of condoms, limiting sex to one partner, avoiding sex with homosexuals, avoiding mosquito bites, avoiding blood transfusion, etc. Knowledge of places for HIV testing was determined by 15 variables for knowledge about voluntary counseling and testing (VCT) clinics, STI clinics, community health centres, hospitals, etc. (see supplemental materials for the complete list of knowledge variables). This second set of knowledge variables refers to knowledge about testing sites in general. Therefore, a health facility, perceived by the respondent as a testing site, might not actually offer HIV testing.

We assume the proportion of perceived but not actual testing sites to be small, and thus ignore their influence.

To reduce the number of variables and to find specific constructs from all the variables, we used factor analysis with principal component extraction and vari-max rotation methods and a factor loading of 0.50 to extract knowledge factors. We used orthogonal (vari-max) rotation because it makes interpretation simpler and also maintains independence of the factors.²⁶ The extracted results represented two underlying knowledge factors from the “means of avoiding AIDS” and three factors of “knowledge of places for HIV testing.” We based our selection of the number of factors on interpretability of factors, instead of selecting them mechanically on the basis of “Eigenvalues” or “Scree plots.”²⁷ The two factors extracted from “means of avoiding AIDS” variables were knowledge about routes of transmission and risky sexual behaviours. In the domain of knowledge about “places for HIV testing,” the three extracted factors had the following interpretations: (1) VCT and STI clinics; (2) hospitals (government/municipal/private); and (3) health centres (urban health posts/family welfare centres/community health clinics).

Demographic and socio-economic predictors

Demographic and socio-economic measures included in the analysis were age, education level, economic status, occupation, religion, residence in an urban or rural area, and number of marriages. Economic status in NFHS-3 was assessed using an index created on the basis of possessing 33 different kinds of assets, as noted by the interviewer. We collapsed the five strata of the index to create the three categories of low (two lowest strata of the index), middle, and high (two highest strata of the index). Education was measured as highest level of education obtained, including no education, primary school only, and secondary or higher. Religion categories were Hindu, Muslim, and other. As a surrogate marker for husband’s likelihood of residing away from home, we categorized husband’s occupation in terms of mobility associated with reported job types. The three job categories were unemployed, jobs that usually require high levels of mobility, and jobs that do not require much mobility. The two marriage categories were married once and married more than once.

Behavioural predictors

We included the following (reported) behavioural characteristics: age at sexual debut (before or after 18 years), ever receiving a blood transfusion, paying for sex in the past year, history of genital sores/ulcers in the past year, whether consuming alcohol at time of sexual encounters, and current contraceptive method(s).^{10,24,25,28} We categorized contraceptive use as no current method, using condoms or female condoms, and “other.”²⁸

Statistical analysis

Descriptive analysis was carried out to determine the distribution of socio-demographic and risk behavioural characteristics of the study population. Bivariate associations of the above characteristics were tested with both outcome variables used in our study. Frequencies, proportions, and corresponding *p* values (Cochran-Mantel-Haenszel chi-square) were calculated.

We implemented multiple logistic regression models for the two dependent variables in our analysis, willingness to be tested and prior testing. Based on our literature review, the independent variables used in the model for willingness to be tested were age, education level, religion, economic status, urban/rural residence, occupation, age at sexual debut, history of genital sores/ulcers in the past year, number of marriages, ever receiving a blood transfusion, paying for sex in the past year, whether consuming alcohol at time of sexual encounters, and current contraceptive method(s), as well as two factors extracted from variables representing knowledge about avoiding AIDS and three factors representing knowledge about places for testing. We used a similar structure for the model with prior testing as a dependent variable, but this model did not include the factors representing knowledge about testing, as participants who had already undergone HIV testing were not asked. We also used few reduced models, which did not show major changes in estimates other than improving precision.

Descriptive and multivariate analyses were carried out using SAS statistical software version 9.3.

Results

According to the NFHS-3 final report, 74,369 of 85,373 eligible married men were interviewed by trained field personnel (87% response rate). We used linked data from the 39,257 couples of whom both husband and wife were surveyed and asked to participate in HIV testing, since we only wanted to focus on information with both partners participating. Among those couples, 27,080 (69%) of the husbands actually underwent testing. Of the 39,257 couples, the husbands of 33,975 (87%) eligible couples were asked if they had ever been tested for HIV; 2455 (7%) reported being tested at least once.¹⁴

Table 1 provides socio-economic, demographic, and behavioural characteristics of the couple-linked married men. More than half of the subjects were 36–54 years old (54.5%) and had secondary or higher education (61.9%), which is commensurate with the 59% (overall) adult secondary school participation rate of Indian males.²⁹ Hinduism was the majority religion (75.3%), and four-fifths had occupations that might require high mobility. There was almost equal representation of participants from urban and rural areas. Most (87.9%) of the married men reported having their sexual debut after 18 years of age, had only one marriage (98.1%), knew about AIDS (86.6%), never received a blood transfusion (94.6%), and had not paid for sex in the past year (99.8%). Only 7.6% reported using a barrier contraceptive, and 1.6% reported a history of genital sores or ulcers in the past year.

Table 2 presents the distribution of testing for HIV in NFHS-3 (willingness to test) and prior testing by socio-demographic and behavioural characteristics. The odds ratios and *p* values from bivariate tests of associations between dependent variables and possible predictor variables are also presented in Table 2. Among the socio-demographic variables, the middle economic group and urban residence were significant ($p < 0.05$) positive predictors of willingness to be tested, whereas lack of education, religion other than Hindu, low economic status, and having no job or low-mobility jobs were found to reduce the odds of willingness to be tested. Among HIV risk behaviour characteristics, the variables of having heard about

AIDS, having paid for sex in the past year, and current use of contraceptives (barrier or other methods) were positively associated with willingness to be tested. Sexual debut before 18 years of age, having married more than once, consuming alcohol at time of sexual encounters, and genital sores in the past year were significant negative predictors of willingness to be tested. When prior testing was treated as outcome in bivariate analysis, being 26–35 years age, Christian/Sikh/other religions, unemployment or low-mobility jobs, and urban residence were found to be significant and positive socio-demographic predictors. Meanwhile, less than secondary education, being Muslim, and low or medium economic status were found to be associated with diminished odds of prior testing. History of blood transfusion and use of barrier contraceptives were associated with increased odds for prior testing, whereas sexual debut before 18 years was the only negatively associated risk behaviour.

In multivariate logistic regression (Table 3), for willingness to be tested, age was not found to be a significant predictor. Having no education was significantly associated, with an 18% increase in odds of willingness to be tested compared to those having secondary or higher education (adjusted odds ratio [AOR] = 1.18, 95% CI 1.06–1.3). Primary education only was associated with a 9% increase in odds over those having secondary or higher education, but it was barely significant (AOR = 1.09, 95% CI 1.0–1.79). Muslims had 9% lower odds of willingness compared to Hindus (AOR = 0.91 95% CI 0.83–0.99), while those of other religions were half as likely to indicate willingness to be tested compared to Hindus (AOR = 0.48, 95% CI 0.44–0.52). Thus, although there was not much difference between the two major religion groups, the significant difference observed among minor religion groups may reflect their higher socio-economic status. Both low (12% higher) and middle (28% higher) economic groups had significantly higher odds of being willing to be tested compared to the high economic status group (low: AOR = 1.12, 95% CI 1.02–1.23; middle: AOR = 1.28, 95% CI 1.18–1.39). Knowledge about hospitals and health/welfare centres providing testing was a significant predictor of willingness. Each unit increase in knowledge factors about testing in hospitals was associated with 14% increased odds of willingness (AOR = 1.14, 95% CI 1.11–1.18), whereas the factor of knowledge about testing in health/welfare centres was negatively associated with willingness to be tested (AOR = 0.96, 95% CI 0.94–0.99). In addition, each unit increase in knowledge about routes of HIV transmission was found to increase the odds (AOR = 1.08, 95% CI 1.04–1.11) of willingness to be tested by 8%. Men who were unemployed or had a job that might not involve mobility had 26% and 22% lower odds, respectively, of being willing to be tested compared to those who had a job requiring high mobility (unemployed: AOR = 0.74, 95% CI 0.58–0.95; low-mobility job: AOR = 0.78, 95% CI 0.72–0.83). Those reporting sexual debut before 18 years of age had 14% lower odds of willingness to be tested compared to those who had sexual debut at or after 18 years (AOR = 0.86, 95% CI 0.79–0.95). Engaging in paid sex, although non-significant because of the very small number reporting it, was associated with 70% increased odds of willingness to test (AOR = 1.7, 95% CI 0.87–3.33). Having a history of genital sores in the past year was associated with 24% decreased odds of willingness (AOR = 0.76, 95% CI 0.6–0.95). Although use of barrier contraceptives was not significantly associated, those using other methods of contraception were 11% more likely to be willing to be tested compared to those

who were not using any contraceptives immediately before the study period (AOR = 1.1, 95% CI 1.04–1.8).

Among predictors of prior testing for HIV, both the youngest (15–25 years) and middle (26–35 years) age groups had significantly higher odds of prior testing compared to the oldest (36–54 years) (15–25 years: AOR = 1.28, 95% CI 1.06–1.53; 26–35 years: AOR = 1.39, 95% CI 1.27–1.53). Having no education or primary school only seemed to substantially decrease the odds of prior testing compared to those having secondary or higher education (no education: AOR = 0.38, 95% CI 0.29–0.49; primary school only: AOR = 0.55, 95% CI 0.46–0.66). Compared to Hindus, the odds of prior testing were not significantly different for Muslims, but men of Christian/Sikh/other religions were about 40% more likely to have undergone prior testing than Hindu men (AOR = 1.43, 95% CI 1.27–1.62). Both low (61%) and middle (39%) economic groups had significantly lower odds of prior testing compared to the wealthy (low: AOR = 0.39, 95% CI 0.32–0.47; middle: AOR = 0.61, 95% CI 0.52–0.7). Each unit of increase in knowledge about routes of HIV transmission was found to increase the odds of prior testing by 18% (AOR = 1.18, 95% CI 1.12–1.23). Unemployment seemed to increase the odds of having prior testing among men compared to those having a job requiring high mobility (AOR = 1.43, 95% CI 1.01–2.03). Those who had a job that might not require high mobility were also about 50% more likely to have undergone prior testing than those having a job requiring high mobility (AOR = 1.5, 95% CI 1.36–1.66). Those reporting sexual debut before 18 years of age had 13% lower odds of prior testing, although this factor did not reach significance (AOR = 0.87, 95% CI 0.73–1.04). History of genital sores (AOR = 1.18, 95% CI 0.81–1.72) and multiple marriages (AOR = 1.35, 95% CI 0.94–1.93) were both associated with increased odds of prior testing, but the small numbers prevented these associations from reaching levels of significance. Similarly, those reporting paid sex were 23% more likely to have prior testing (AOR = 1.23, 95% CI 0.48–3.14), but their numbers were too low to achieve significance. History of receiving a blood transfusion was found to be significantly associated with prior HIV testing, with a 33% increase in odds compared to those who never received a transfusion (AOR = 1.33, 95% CI 1.12–1.57). Those using barrier contraceptive methods had 26% higher odds of prior testing for HIV compared to those who were not using any contraceptive method (AOR = 1.26, 95% CI 1.1–1.45).

Discussion

Unlike HIV high-risk groups and bridge populations, married couples are not targeted for interventions for HIV in India.^{12,28} Studies have shown that wives in typical Indian families were being infected by their husbands when they were injection drug users (IDUs), bisexual, or engaging in other high-risk sexual behaviours.^{30,31} To the best of our knowledge, no study so far has explored the determinants of prior HIV testing or willingness to be tested among married men in India, despite the widespread knowledge that husbands are often the only source of infection for their monogamous wives.^{9–11} Thus, identifying the predictors of testing among married men may help in formulating strategies to prevent spread of infection to the general population, as knowledge of HIV status is the foremost requirement to bring the infected under care. We would also like to reiterate that our analysis used multivariate logistic regression to produce estimates for a single predictor while simultaneously adjusting

for other predictors (which may be potential confounders). We therefore cannot rule out confounding by unmeasured factors. It is possible that married men who agreed to be tested in NFHS-3 and those with prior testing were different from the rest of the population in terms of unmeasured risk factors. It is difficult to get an estimate of the effect of these factors, as they may vary with regional practices in a country as diverse as India.

Our analysis of socio-demographic and behavioural correlates revealed that age at sexual debut, religion, knowledge about HIV testing at hospitals and health/ welfare centres, a history of genital sores, and contraceptive use other than condoms were significantly associated only with willingness to be tested. On the other hand, age, religions other than Hindu or Muslim, ever receiving a blood transfusion, and condom usage significantly predicted prior testing for HIV, but not willingness to be tested. Education level, higher economic status, knowledge about routes of HIV transmission, and type of occupation were significant for both willingness to be tested and prior testing, but not necessarily in the same direction. We acknowledge that some of the differences based on statistical cut-off may only be artifacts of the large sample size of this study. Based on our prior knowledge, predictors such as religion and age at sexual debut do not seem to be significant unless they serve as surrogates of socio-economic status and risky sexual behaviours, respectively.

A Chinese study reported a positive association between willingness to be tested and knowledge about local testing sites, while a Ugandan study did not find the association to be significant.^{17,32} We tried to differentiate between knowledge about different types of testing sites and found that knowledge of testing in private/government hospitals was positively associated with willingness to be tested, although no association was found for knowledge about VCT/STI centres, and there was a slight negative association for knowledge of availability of testing at health/welfare centres. Knowledge about VCT/STIs might predispose one's willingness, but might also be associated with stigma. The negative association with knowledge about testing availability at health centres might be due to concerns about quality of care offered. We emphasize that the factor scores representing knowledge variables were continuous measures. Therefore, the odds ratios associated with a single unit change may or may not be relevant for any knowledge-based interventions, which can lead to substantial (multiple units) improvement in knowledge.

Among the socio-demographic and risk behavioural predictors, the associations with willingness to be tested and prior testing were often in opposite directions. Having less than secondary education was a positive predictor for willingness to be tested, but had a negative association with prior testing. This corroborates an earlier study in Africa.¹⁷ This might be because education is often associated with knowledge about HIV, and economic status, a close correlate of education level, may determine access to health care. Thus, the less educated were less likely to have been previously tested. Although economic status and knowledge about HIV were adjusted for in our model, any incomplete adjustment (due to insufficient categorization and use of surrogate variables) might partially explain the association of educational status with prior testing. A similar argument may apply to the finding that people of religions other than Hindu/Muslim (Christian/Sikh) were more likely to have undergone prior testing but were less likely to have consented to testing in NFHS-3 as, typically, they might have higher socio-economic status than Hindus/ Muslims.³³ This

reasoning was also corroborated by the fact that low and middle economic status (versus wealthy) predisposes one to greater willingness to be tested but negatively predicts prior testing. Unemployed men and those who had apparent low-mobility jobs, compared to those with high-mobility jobs, were less willing to be tested but more likely to have been previously tested. A history of genital sores in the past year was found to be negatively associated only with willingness to be tested, possibly because of associated stigma and fear of diagnosis. On the other hand, history of receiving a blood transfusion was positively associated only with prior testing,³² which was expected, as blood transfusions are often associated with diseases/conditions that might have required HIV testing. No associations were found between willingness to be tested and barrier contraceptives, but it did positively predict prior testing, which could have been due to the fact that having HIV or other STIs might predispose one to test for HIV and also use condoms. Sexual debut at younger than 18 years was not associated with prior testing, but was negatively associated with willingness to be tested, which contradicts the findings of a previous Chinese study among migrants.³² This could have been because our study analyzed the general population rather than a high-risk group. Involuntary prior testing (e.g., part of other diagnostics) might partly explain the disparate results between the two outcome groups. Some of the commonly accepted HIV risk behaviours such as unemployment, early sexual debut, history of STIs, and multiple marriages were found to be negatively associated with willingness to be tested, probably because these risk behaviours were not perceived as such by the respondents. This finding is similar to that reported by Stein and Nyamathi¹⁸ No definite associations with either of the outcome variables were found for paid sex and consumption of alcohol at time of sexual encounters;^{17,24,32,34} this could be an artifact due to the small numbers reporting these behaviours, as suggested by their wide confidence intervals.

Limitations

Our study suffered from certain limitations in making causal inferences, because it was cross-sectional. The orders of predictors were often unclear, such as whether willingness to be tested determined knowledge and other risk behaviours or the other way around. Despite having a large sample size, the numbers in certain categories were quite low, such as being unemployed, prior testing amongst those with lowest economic status, those consuming alcohol at time of sexual encounters, men with multiple marriages, receiving a blood transfusion, paying for sex, etc. These sparse data might have prevented detecting an association that might have been more apparent with larger numbers. The small numbers might also have been due to reporting biases in response to sensitive questions asked in face-to-face interviews. This reporting bias could have worked in both directions, as reported in other previous studies.³⁵ In addition, the use of secondary data prevented us from objectively exploring several predictors, such as stigma, which has been reported in previous studies from other countries. Despite these limitations, we can assume that the data collected according to a systematic sampling technique and protocol used in multiple countries from this large-scale nationally representative survey should be fairly free of any major sampling errors. Thus, the inferences from this analysis may be cautiously extrapolated to the national level.

Inference from our study might also suffer from the fact that we used the proportion of married men who agreed to be tested as part of NFHS-3 as an indicator of their willingness to be tested. Being willing to be tested anonymously without learning the test results is different from being tested and knowing that you will be given the test results. Behaviour change and care-seeking only occurs if the tested individuals receive their results.³⁶ Nonetheless, willingness to be tested without receiving the results does contribute to the understanding of the magnitude and characteristics of the HIV epidemic and is therefore useful. In this context, it was encouraging that the overwhelming majority of husbands in the couples participating in the survey were willing to be tested.

Recommendations

Regardless of the above limitations, our study suggests that implementing interventions that may improve knowledge about HIV testing sites and overall knowledge regarding HIV/AIDS among married men in India, especially those engaging in potentially high-risk behaviours, may increase their likelihood of being tested. To overcome the limitations of using cross-sectional data, a large-scale longitudinal study could be planned for the high-risk married men to further explore variables associated with being tested when receiving the test results. This may also overcome the limitations that we faced with use of secondary data.

Acknowledgments

We express our gratitude to Wendy Aft for her critical input.

Funding

This study was financially supported by a grant from National Institutes of Health, Fogarty AIDS International Training Program (D43 TW000013).

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Table 1

Socio-demographic and risk behaviour characteristics of the husbands of married couples for whom both husband and wife participated in NFHS-3 ($n = 39257$), 2005–06.

Characteristics	Total ^a	
	Number	Percentage
<i>Age group (years)</i>		
15–25	3647	9.29
26–35	14,224	36.23
36–54	21,386	54.48
<i>Highest education level</i>		
No education	7582	19.32
Primary	7380	18.81
Secondary or higher	24,282	61.87
<i>Religion</i>		
Hindu	29,551	75.29
Muslim	4658	11.87
Christian/Sikh/other	5040	12.84
<i>Economic index</i>		
Lowest/low	10,627	27.07
Middle	7925	20.19
High/highest	20,705	52.74
<i>Occupation</i>		
Unemployed	544	1.39
Job requiring high mobility; e.g., sales, agriculture, skilled labourer, etc.	30,703	78.32
Job not requiring high mobility; e.g. technical, service, clerical, unskilled labourer, etc.	7957	20.3
<i>Residence</i>		
Urban	18,442	46.98
Rural	20,815	53.02
<i>Age at sexual debut</i>		
18 years and above	34,450	87.87
Between 10 and 17 yrs	4754	12.13
<i>No. of marriages</i>		
>1 marriages	751	1.91
1 marriage	38,506	98.09
<i>Consumes alcohol at time of sexual encounters</i>		
Yes	1061	2.7
No	38,187	97.3
<i>Had heard of AIDS</i>		
Yes	33,977	86.56
No	5276	13.44
<i>Ever tested for HIV previously</i>		
Yes	2455	7.23

Characteristics	Total ^a	
	Number	Percentage
No	31,520	92.77
<i>Ever received a blood transfusion</i>		
Yes	2103	5.37
No	37,092	94.63
<i>Had paid for sex in past year</i>		
Yes	83	0.22
No	37,718	99.78
<i>Current contraceptive usage</i>		
None	19,231	48.99
Condoms/female condoms	2974	7.58
Other methods	17,052	43.44
<i>Had genital sore/ulcer in past year</i>		
Yes	607	1.55
No	38,494	98.45

NFHS-3: Indian National Family Health Survey-3.

^aValues may not sum to 100% due to missing and rounded numbers

Table 2

Distribution and associations from bivariate testing of husbands of married couples who tested for HIV in NFHS-3 (n = 39,257) and those who had ever been tested before (n = 33,975) by socio-demographic and risk behaviour characteristics, NFHS-3, 2005–2006.

Characteristics	Tested for HIV in NFHS-3 (%)				Ever tested for HIV before NFHS-3 (%)			
	No	Yes	Unadjusted OR	p Value	No	Yes	Unadjusted OR	p Value
Total (n)	12,177 (31)	27,080 (69)	–	–	31,520 (93)	2455 (7)	–	–
<i>Age group</i>								
15–25 years	1173 (32)	2474 (68)	0.95	0.148	2936 (94)	180 (6)	0.86	0.072
26–35 years	4380 (31)	9844 (69)	1.01	0.719	11,556 (92)	1064 (8)	1.3	<.0001 ^b
36–54 years	6624 (31)	14,762 (69)	–	–	17,028 (93)	1211 (7)	–	–
<i>Highest education level</i>								
No education	2454 (32)	5128 (68)	0.94	0.022 ^a	4,464 (98)	90 (2)	0.2	<.0001 ^b
Primary education	2202 (30)	5178 (70)	1.06	0.066	5777 (97)	204 (3)	0.35	<.0001 ^b
Secondary or higher	7519 (31)	16,763 (69)	–	–	21,271 (91)	2159 (9)	–	–
<i>Religion</i>								
Hindu	8212 (28)	21,339 (72)	–	–	23,578 (93)	1769 (7)	–	–
Muslim	1492 (32)	3166 (68)	0.82	<.0001 ^b	3769 (94)	229 (6)	0.81	0.004 ^b
Christian/Sikh/other	2469 (49)	2571 (51)	0.4	<.0001 ^b	4167 (90)	456 (10)	1.46	<.0001 ^b
<i>Economic index</i>								
Lowest/low	3464 (33)	7163 (67)	0.95	0.03 ^a	6786 (98)	152 (2)	0.2	<.0001 ^b
Middle	2214 (28)	5711 (72)	1.18	<.0001 ^b	6656 (96)	306 (4)	0.42	<.0001 ^b
High/highest	6499 (31)	14,206 (69)	–	–	18,078 (90)	1997 (10)	–	–
<i>Occupation</i>								
Unemployed	211 (39)	333 (61)	0.67	<.0001 ^b	432 (91)	45 (9)	1.72	0.0006 ^b
Jobs requiring high mobility; e.g. sales, agriculture, skilled labour, etc.	9167 (30)	21,536 (70)	–	–	24,235 (94)	1465 (6)	–	–
Jobs not requiring high mobility; e.g. technical, service, clerical, unskilled labour, etc.	2775 (35)	5182 (65)	0.8	<.0001 ^b	6812 (88)	940 (12)	2.28	<.0001 ^b
<i>Residence</i>								
Urban	5628 (31)	12,814 (69)	1.05	0.043 ^a	16,057 (91)	1594 (9)	1.78	<.0001 ^b
Rural	6549 (31)	14,266 (69)	–	–	15,463 (95)	861 (5)	–	–

Characteristics	Tested for HIV in NFHS-3 (%)				Ever tested for HIV before NFHS-3 (%)			
	No	Yes	Unadjusted OR	p Value	No	Yes	Unadjusted OR	p Value
<i>Age at sexual debut</i>								
18 years and above	10,619 (31)	23,831 (69)	–	–	28,006 (92)	2272 (8)	–	–
Between 10 and 17 yrs	1540 (33)	3,214 (67)	0.93	0.028 ^a	3474 (95)	179 (5)	0.64	<0.0001 ^b
<i>No. of marriages</i>								
> 1 marriages	274 (36)	477 (64)	0.78	0.001 ^b	539 (93)	40 (7)	0.95	0.766
1 marriage	11,903 (31)	26,603 (69)	–	–	30,981 (93)	2415 (7)	–	–
<i>Consumes alcohol at time of sexual encounters</i>								
Yes	437 (41)	624 (59)	0.63	<0.0001 ^b	653 (95)	38 (5)	0.74	0.078
No	11,739 (31)	26,448 (69)	–	–	30,860 (93)	2416 (7)	–	–
<i>Had heard about AIDS</i>								
Yes	10,182 (30)	23,795 (70)	1.42	<0.0001 ^b	31,520 (93)	2455 (7)	–	–
No	1992 (38)	3,284 (62)	–	–	–	–	–	–
<i>Ever received a blood transfusion</i>								
Yes	623 (30)	1480 (70)	1.07	0.153	1739 (91)	181 (9)	1.36	0.0001 ^b
No	11,538 (31)	25,554 (69)	–	–	29,731 (93)	2271 (7)	–	–
<i>Paid for sex in past year</i>								
Yes	17 (20)	66 (80)	1.76	0.039 ^a	67 (92)	6 (8)	1.14	0.757
No	11,753 (31)	25,965 (69)	–	–	30,384 (93)	2385 (7)	–	–
<i>Current contraceptive usage</i>								
None	6414 (33)	12,817 (67)	–	–	15,064 (93)	1099 (7)	–	–
Condoms/female	925 (31)	2,049 (69)	1.11	0.015 ^a	2554 (89)	323(11)	1.73	<0.0001 ^b
Other methods	4838 (28)	12,214 (72)	1.26	<0.0001 ^b	13,902 (93)	1033 (7)	1.02	0.683
<i>Had genital sore/ulcer in past year</i>								
Yes	214 (35)	393 (65)	0.82	0.024 ^a	457 (92)	38 (8)	1.07	0.697
No	11,927 (31)	26,567 (69)	–	–	30,957 (93)	2409 (7)	–	–

NFHS-3: Indian National Family Health Survey-3.

Values may not sum to 100% due to missing and rounded numbers.

^a $p < 0.05$.

$p < 0.001$

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Table 3

Predictors of willingness to be tested for HIV in NFHS-3 and prior HIV testing of husbands of married couples from multinomial logistic regression, NFHS-3, 2005–2006.

Variables	Willingness to be tested for HIV in NFHS-3 vs. not being tested Adjusted odds ratio (OR)		Prior testing for HIV before NFHS-3 vs. no prior testing Adjusted odds ratio	
	OR	95% CI	OR	95% CI
<i>Age group</i>				
15–25 years	0.96	0.86, 1.07	1.28 ^a	1.06, 1.53
26–35 years	1.01	0.95, 1.07	1.39 ^a	1.27, 1.53
36–54 years	–	–	–	–
<i>Highest education level</i>				
No education	1.18 ^a	1.06, 1.3	0.38 ^a	0.29, 0.49
Primary education	1.09	1, 1.18	0.55 ^a	0.46, 0.66
Secondary or higher	–	–	–	–
<i>Religion</i>				
Hindu	–	–	–	–
Muslim	0.91 ^b	0.83, 0.99	0.91	0.78, 1.06
Christian/Sikh/other	0.48 ^a	0.44, 0.52	1.43 ^a	1.27, 1.62
<i>Economic index</i>				
Lowest/low	1.12 ^b	1.02, 1.23	0.39 ^a	0.32, 0.47
Middle	1.28 ^a	1.18, 1.39	0.61 ^a	0.52, 0.7
High/highest	–	–	–	–
<i>Residence</i>				
Urban	1.00	0.93, 1.07	1.06	0.96, 1.18
Rural	–	–	–	–
Factor representing knowledge that HIV testing can be performed in VCT and STI clinics	0.99	0.97, 1.02	–	–
Factor representing knowledge that HIV testing can be performed in government/ municipal/ private hospitals	1.14 ^a	1.11, 1.18	–	–
Factor representing knowledge that HIV testing can be performed in urban and rural health centres/ family welfare centres/rural community health centres	0.96 ^a	0.94, 0.99	–	–
Factor representing knowledge about routes of HIV transmission and prevention	1.08 ^a	1.04, 1.11	1.18 ^a	1.124, 1.23
Factor representing knowledge about HIV risk behaviours and prevention	0.98	0.95, 1	1.03	1, 1.07
<i>Occupation</i>				
Unemployed	0.74 ^b	0.58, 0.95	1.43 ^b	1.01 2.04
Jobs requiring high mobility e.g. sales, agricultural workers, skilled labourer etc.	–	–	–	–
Jobs not requiring high mobility e.g. technical, service, clerical, unskilled labourer etc.	0.78 ^a	0.72, 0.83	1.50 ^a	1.36, 1.66

Variables	Willingness to be tested for HIV in NFHS-3 vs. not being tested Adjusted odds ratio (OR)		Prior testing for HIV before NFHS-3 vs. no prior testing Adjusted odds ratio	
	OR	95% CI	OR	95% CI
Age at first intercourse				
18 years and older	–	–	–	–
Between 10 and 17 years	0.86 ^a	0.79, 0.95	0.87	0.73, 1.04
<i>Had genital sore/ulcer in past year</i>				
Yes	0.76 ^b	0.6, 0.95	1.18	0.81, 1.72
No	–	–	–	–
<i>No. of marriages</i>				
>1 marriages	0.81	0.65, 1.01	1.35	0.94, 1.93
1 marriage	–	–	–	–
<i>Ever received a blood transfusion</i>				
Yes	0.99	0.87, 1.12	1.33 ^a	1.12, 1.57
No	–	–	–	–
<i>Had paid for sex in past year</i>				
Yes	1.70	0.87, 3.33	1.23	0.48, 3.14
No	–	–	–	–
<i>Consumes alcohol at time of sexual encounters</i>				
Yes	1.01	0.82, 1.25	0.97	0.67, 1.4
No	–	–	–	–
<i>Current contraceptive usage</i>				
None	–	–	–	–
Condoms/female condoms	1.00	0.91, 1.11	1.26 ^a	1.1, 1.45
Other methods	1.11 ^a	1.04, 1.18	0.98	0.89, 1.09

NFHS-3: Indian National Family Health Survey-3; STI: sexually transmitted infection; VCT: voluntary counseling and testing.

^a $p < 0.01$.

^b $p < 0.05$.