# Sexually transmitted infection risk behaviors in rural Thai adolescents and young adults: Support for gender- and age-specific interventions

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## Abstract

STI prevalence and risks in a sample of rural Thai adolescents and young adults (14–29 years old) were examined. Unprotected sex with a casual partner conferred the greatest risk for prevalent STIs, particularly for younger adolescents and alcohol use increased the STI risk for women but not for men.

## Key words/phrases

Thailand; adolescents; sexually transmitted infections; gender; social norms

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Thailand has experienced a significant decrease in HIV infection over the past two decades, with the greatest reductions in prevalence observed among the most at-risk populations [1, 2, 3]. Despite this notable prevention success in controlling a former HIV epidemic (due in large part to the adoption of a government-initiated nationwide education and prevention campaigns [4, 5]), Thailand's HIV epidemic is thought to be poised for resurgence. HIV/AIDS is the leading cause of death for adolescent females and second most common cause of death for adolescent and young adult males (15–24 years) [6]. Between 2000 and 2004, new sexually transmitted infection (STI) cases reported among Thai students increased from 3% to 10% [6].

Thailand is experiencing a cultural transition in sexual norms and practices, particularly among adolescents and young adults [7, 8]. An increase in the acceptance of premarital sex coupled with a decrease in condom use among youth and young adults [9] has been identified as one of the threats to Thailand's continued HIV prevention success [1]. This creates an emerging susceptible population which will require new prevention strategies if Thailand is to maintain its goal of reducing its HIV epidemic. Limited information exists on the state of STIs in rural areas of Thailand; therefore, the current analysis examines the STI prevalence and associated gender-and age-specific risk factors among a representative sample of youth in rural Thailand.

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These data were collected in advance of a community-based clustered randomized study designed to investigate the impact of community-level strategies to reduce substance use and STI/HIV-related risk behaviors among adolescents and young adults. These baseline data, with a participation rate over 90%, were collected using a community clustered design with a multi-stage nested sampling design and provided a representative sample of the rural population aged 14–29 (N = 2055).

The current analysis was restricted to the 1218 (59.3%) observations at baseline among participants who had experienced sexual debut and then further restricted to 1192 (97.9%) participants for whom STI testing was completed. The distribution of sex-, alcohol- and drug-related STI risk factors across age and by gender and the associations between prevalent STIs and various sex-, alcohol- and drug-related risk factors were evaluated. Participants testing positive for at least one STI (i.e., HIV, gonorrhea, or Chlamydia) at baseline were identified as having a prevalent STI. Prevalent STI was defined in this manner to improve statistical power and highlight risks and protective factors associated with the general burden of disease without focus on any one infection. Odds ratios were obtained using generalized linear regression with general estimating equation methods (XTGEE, Stata 12.0) and robust standard error estimation to account for the correlation between individuals sampled from the same sub-district.

The demographics of the sample are given in Table 1. At baseline, 10.0%, 1.9% and 1.1% of the sample had prevalent Chlamydia, gonorrhea, or HIV, respectively, with an overall HIV or STI prevalence of 12.4%. The prevalence of any STI/HIV by district among those reporting sexual debut, ranged from 8.9% in Chiang Dao to 15.7% in San Kampaeng, variation that may be due to distance from the city, presence of a university, or unmeasured differences including community and network factors. Sex-, drug- and alcohol-related STI-risk behaviors varied by age and gender. Compared to women, men had an earlier average age of sexual debut, were more likely to have multiple partners in the last 3 months, had lower proportions of protected sex and had a greater number of lifetime sex partners. Although low for both sexes, women used condoms less often during sex with their regular partners than men. Having sex while drunk or high was more prevalent in men and older age groups. As age category increased, the percentage of protected anal and vaginal sex decreased. There was a statistically significant change in the type of partner across age, likely owing to the increase in the proportion of adolescents with regular partners as age increased. Condom use with regular partners, but not casual partners, decreased with age.

Among 14–19 year olds, those with casual partners had statistically significantly higher odds of having an STI in the multiple logistic regression model (Table 2). This was true for those with both more frequent protected sex and less frequent protected sex with casual partners. This pattern of association was not present for older age groups. While those who were married (9.6%) were moderately less likely to have an STI than those not married (13.5%, p = .07), the additional protection afforded by marriage compared to those that reported regular (but non-marital relationships), was not statistically significant (OR = .740; 95% CI = .468, 1.17; results not shown).

An interaction was observed between frequency of alcohol use and gender. For men, increased alcohol use was negatively associated with STIs at baseline, conferring 81% and 76% decrease in odds for those who used alcohol less than 1 time a week or greater than one time a week, respectively, compared to men who never used alcohol. In contrast, women had almost 4 times the odds of STIs when using alcohol less than 1 time a week compared to women who had never used alcohol (aOR: 3.76; 95% CI: 1.30, 10.9). Non-drinking women had a 90% decreased odds of STIs compared to non-drinking men (aOR: .098, 95% CI: .018, .526; results not shown), all else being equal.

We report a number of gender differences in the alcohol, drug and sexual risk behaviors for rural Thais between the ages of 14 and 29. The greater use of condoms in men compared to women regardless of the type of partner (casual or regular) may reflect the transition in young men from sex with commercial sex workers to regular and casual partners and the greater exposure and saliency of HIV-prevention messages given the socially sanctioned earlier sexual debut and high-risk nature of the commercial partners of young men. Traditionally, male adolescents in urban settings are often taken to a brothel by older friends or relatives for their first sexual experience [10]; however, the literature also suggests a trend for young men in response to the HIV epidemic in Thailand away from commercial sex due to fears of acquiring HIV [7, 11]. Age also modified the effects of a number of risk factors, showing a trend toward diminishing risk at older ages which coincides with the current literature suggesting that STIs and sexual attitudes and behavior vary by age [6, 12, 13, 14].

Gender differences in STI risk factors have been found in other studies [15]. However, the current study found new evidence to suggest that alcohol use may increase the risk of prevalent STIs for women, but protect men. The social norms of rural Thai sexual behavior may provide some insight into understanding the observed interaction between alcohol use and gender on STI risk. While the gender gap in pre-marital sexual exploration [16] is narrowing in Thailand, the impact of gender-based sexual norms may remain particularly salient for rural youth. Specifically, the increased sexual freedom for Thai women described by researchers in urban settings [7] may not apply to women in rural Thailand. Compared to Thai youth in urban settings, extended and neighboring families have a greater purview and authority over the social behavior of youth in these tight-knit rural settings [17], creating a context in which traditional, gender-disparate norms can be directly or indirectly enforced [12, 13]. For rural youth, greater obligation to and dependence on family may further reinforce family control [18] and traditional social structures. Alcohol has been thought to decrease inhibitions [19]; however, many researchers suggest alcohol exerts its effects, not through physiological pathways (i.e., disinhibition of the brain control centers that restrain sexual impulses) but through cognitive and social learning processes whereby alcohol is a cue for a set of socially-sanctioned, less constrained behaviors [20, 21]. The observed interaction between gender and alcohol may be a reflection of physiologically- or cognitively-driven departure from gender-based social norms on sexual behavior, norms which are more constraining for women than men. Furthermore, because young women have essentially been overlooked by public health campaigns, there may be a reduced ability for women to manage their risk properly [7].

The current study was limited by the cross-sectional nature of the data; and the correlates described should not be construed as causal factors. However, the study is novel in its examination of STIs and their individual-level correlates in a representative sample of rural Thai adolescents. Our study suggests that interventions in the rural context should incorporate gender-specific education on the effects of alcohol on sexual behavior, with specific attention to addressing the needs and risks of young women. Energy should also be focused on the youngest adolescents who, this study suggests, may be at highest risk for STI and who have the least experience with drinking alcohol. Finally, interventions addressing the realities of sexual norms and the persistence of gender biases, particularly in rural settings, could encourage the incorporation of new health-related behavior within the context of existing value systems.

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**Table 1**

Demographics

| Baseline Characteristics | Total/Mean N = 1192 (%) | Age group, years | | | | p-value | Gender | | p-value |
|---|---|---|---|---|---|---|---|---|---|
| | | 14–16 n=125 (%) | 17–19 n=275 (%) | 20–24 n=425 (%) | 25–29 n=367 (%) | | Male n = 670 (%) | Female N = 521 (%) | |
| Male | 670 (56.2) | 71 (56.8) | 170 (61.8) | 232 (54.6) | 197 (53.7) | .176 | | | |
| Married | 342 (28.2) | 2 (.34) | 26 (9.45) | 131 (30.8) | 183 (49.9) | .000 | 121 (18.1) | 221 (42.3) | .000 |
| Currently attending school (n=1191) | 476 (40.0) | 111 (88.8) | 200 (72.7) | 134 (31.5) | 31 (8.47) | .000 | 276 (41.2) | 200 (38.4) | .327 |
| Working part-time or full-time | 566 (47.5) | 13 (10.4) | 70 (25.4) | 222 (52.2) | 261 (71.1) | .000 | 325 (48.5) | 241 (46.2) | .422 |
| Ever been arrested by police | 114 (9.56) | 5 (4.00) | 22 (8.00) | 41 (9.65) | 46 (12.5) | .029 | 101 (15.1) | 13 (2.49) | .000 |
| Age of first intercourse, $M$ ($Sd$) | 17.35 (4.16) | 14.6 (1.07) | 16.0 (1.43) | 18.1 (5.84) | 18.4 (3.02) | .000 | 16.6 (2.33) | 18.3 (5.57) | .000 |
| HIV-positive (n=1187) | 13 (1.10) | 1 (.81) | 2 (.73) | 3 (.71) | 7 (1.91) | .351 | 9 (1.35) | 4 (.77) | .347 |
| Chlamydia | 119 (9.98) | 14 (11.2) | 43 (15.6) | 39 (9.18) | 23 (6.27) | .001 | 71 (10.6) | 48 (9.20) | .423 |
| Gonorrhea | 22 (1.85) | 3 (2.40) | 8 (2.91) | 8 (1.88) | 3 (.82) | .254 | 11 (1.64) | 11 (2.11) | .554 |
| Any STI | 148 (12.42) | 18 (14.4) | 49 (17.8) | 48 (11.3) | 33 (8.99) | .006 | 89 (13.3) | 59 (11.3) | .304 |
| Ever had alcohol | 1079 (90.5) | 105 (84.0) | 251 (91.3) | 383 (90.1) | 340 (92.6) | .039 | 654 (97.6) | 425 (81.4) | .000 |
| Age of first alcohol, $M$($Sd$) (n=1079) | 15.9 (2.41) | 13.8 (1.26) | 14.9 (1.82) | 16.2 (2.23) | 16.8 (2.62) | .000 | 15.3 (2.26) | 16.7 (2.40) | .000 |
| Frequency of alcohol use (n=1085) | | | | | | .000 | | | .000 |
| 0: Never had alcohol | 113 (10.4) | 20 (16.4) | 24 (9.23) | 42 (11.0) | 27 (8.39) | | 16 (2.45) | 97 (22.4) | |
| 1: Alcohol < 1x per week | 544 (50.1) | 76 (62.3) | 146 (56.2) | 184 (48.3) | 138 (42.9) | | 271 (41.6) | 273 (63.0) | |
| 2: Alcohol at least 1x per week+ | 428 (39.4) | 26 (21.3) | 90 (34.6) | 155 (40.7) | 157 (48.8) | | 365 (56.0) | 63 (14.6) | |
| Frequency of marijuana use | | | | | | .000 | | | .000 |
| 0: Never had marijuana | 892 (74.8) | 97 (77.6) | 198 (72.0) | 321 (75.5) | 276 (75.2) | | 398 (59.4) | 494 (94.6) | |
| 1: No marijuana in last 3 months | 258 (21.6) | 16 (12.8) | 63 (22.9) | 88 (20.7) | 91 (24.8) | | 233 (34.8) | 25 (4.79) | |
| 2: Marijuana at least one time/month | 42 (3.52) | 12 (9.60) | 14 (5.09) | 16 (3.76) | 0 (0.0) | | 39 (5.82) | 3 (.57) | |
| Frequency of yaba use | | | | | | .000 | | | .000 |
| 0: Never had yaba | 846 (71.0) | 105 (84.0) | 197 (71.6) | 300 (70.6) | 244 (66.5) | | 388 (57.9) | 458 (87.7) | |
| 1: No yaba in last 3 months | 237 (19.9) | 9 (7.20) | 44 (16.0) | 83 (19.5) | 101 (27.5) | | 187 (27.9) | 50 (9.58) | |
| 2: Yaba 1x per month or less | 62 (5.20) | 5 (4.00) | 22 (8.00) | 24 (5.65) | 11 (3.00) | | 54 (8.06) | 8 (1.53) | |
| 3: Yaba 2–3 days a month | 23 (1.93) | 3 (2.40) | 7 (2.55) | 6 (1.41) | 7 (1.91) | | 21 (3.13) | 2 (.38) | |
| 4: Yaba once a week or greater | 24 (2.01) | 3 (2.40) | 5 (1.82) | 12 (2.82) | 4 (1.09) | | 20 (2.99) | 4 (.77) | |
| Identify as bisexual or homosexual | 53 (4.45) | 6 (4.80) | 16 (5.82) | 23 (5.41) | 8 (2.18) | .085 | 29 (4.33) | 24 (4.60) | .823 |

| Baseline Characteristics | Total/Mean N = 1192 (%) | Age group, years | | | | | Gender | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 14–16 n=125 (%) | 17–19 n=275 (%) | 20–24 n=425 (%) | 25–29 n=367 (%) | p-value | Male n = 670 (%) | Female N = 521 (%) | p-value |
| Total # lifetime sex partners M(Sd) (n=1189) | 4.42 (7.40) | 2.68 (3.37) | 3.86 (5.15) | 4.15 (5.79) | 5.74 (10.6) | .000 | 5.99 (8.57) | 2.40 (4.84) | .000 |
| Multiple partners in the last 3 mos | 117 (9.82) | 10 (8.00) | 34 (12.4) | 47 (11.1) | 26 (7.08) | .097 | 95 (14.2) | 22 (4.21) | .000 |
| Percent of protected anal and vaginal sex M(Sd) (n=800) | 25.4 (39.2) | 42.0 (45.8) | 38.1 (43.0) | 22.2 (36.8) | 16.3 (33.6) | .000 | 30.7 (41.0) | 19.6 (36.2) | .000 |
| Partner type in the last 3 months | | | | | | .006 | | | .000 |
| 0: No partner | 288 (24.2) | 44 (35.2) | 70 (25.4) | 93 (21.9) | 81 (22.1) | | 189 (28.2) | 99 (19.0) | |
| 1: Regular partner only | 791 (66.4) | 73 (58.4) | 167 (60.7) | 290 (68.2) | 261 (71.1) | | 386 (57.6) | 405 (77.6) | |
| 2: Causal partner only | 38 (3.19) | 3 (2.40) | 12 (4.36) | 12 (2.82) | 11 (3.00) | | 34 (5.07) | 4 (.77) | |
| 3: Both regular and casual partners | 75 (6.29) | 5 (4.00) | 26 (9.45) | 30 (7.06) | 14 (3.81) | | 61 (9.10) | 14 (2.68) | |
| Protected sex with regular partners | | | | | | .000 | | | .000 |
| 0: No regular partner in last 3 months | 326 (27.4) | 47 (37.9) | 82 (30.2) | 105 (24.7) | 92 (25.1) | | 223 (33.3) | 103 (19.8) | |
| 1: Had protected sex half the time or greater with regular partner/s | 248 (20.9) | 34 (27.4) | 77 (28.3) | 91 (21.4) | 46 (12.5) | | 158 (23.6) | 90 (17.3) | |
| 2: Had protected sex less than half time with regular partner/s | 614 (51.7) | 43 (34.7) | 113 (41.5) | 229 (53.9) | 229 (62.4) | | 288 (43.0) | 326 (62.8) | |
| Protected sex with casual partners | | | | | | .098 | | | .000 |
| 0: No casual partner in the last 3 mos | 1079 (90.5) | 117 (93.6) | 237 (86.2) | 383 (90.1) | 342 (93.2) | | 575 (85.8) | 504 (96.6) | |
| 1: Had protected sex half the time or greater with casual partner/s | 76 (6.38) | 5 (4.00) | 25 (9.09) | 29 (6.82) | 17 (4.63) | | 68 (10.2) | 8 (1.53) | |
| 2: Had protected sex less than half the time with casual partner/s | 37 (3.10) | 3 (2.40) | 13 (4.73) | 13 (3.06) | 8 (2.18) | | 27 (4.03) | 10 (1.92) | |
| Had any sex while drunk/high in last 3 mos (n=904) | 376 (41.6) | 17 (21.0) | 82 (40.0) | 155 (46.7) | 122 (42.7) | .000 | 270 (56.1) | 106 (25.1) | .000 |
| Sex drunk/high with regular partner/s | | | | | | .000 | | | .000 |
| 0: No regular partner in the last months | 326 (27.4) | 47 (37.6) | 82 (29.8) | 105 (24.7) | 92 (25.1) | | 223 (33.3) | 103 (19.7) | |
| 1: Regular partner/s, no sex drunk/high | 517 (43.4) | 64 (51.2) | 119 (43.3) | 174 (40.9) | 160 (43.6) | | 201 (30.0) | 316 (60.5) | |
| 2: Sex drunk/high with regular partner/s | 349 (29.3) | 14 (11.2) | 74 (26.9) | 146 (34.4) | 115 (31.3) | | 246 (36.7) | 103 (19.7) | |
| Sex drunk/high with casual partner/s | | | | | | .094 | | | .000 |
| 0: No casual partner in the last months | 1079 (90.5) | 117 (93.6) | 237 (86.2) | 383 (90.1) | 342 (93.2) | | 575 (85.8) | 504 (96.6) | |

| Baseline Characteristics | Total/Mean N = 1192 (%) | Age group, years | | | | | | Gender | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 14–16 n=125 (%) | 17–19 n=275 (%) | 20–24 n=425 (%) | 25–29 n=367 (%) | p-value | Male n = 670 (%) | Female N = 521 (%) | p-value |
| 1: Casual partner/s, no sex drunk/high | 36 (3.02) | 2 (1.60) | 12 (4.36) | 9 (2.45) | 9 (2.45) | | 29 (4.33) | 7 (1.34) | |
| 2: Sex drunk/high with casual partner/s | 77 (6.46) | 6 (4.80) | 26 (9.45) | 16 (4.36) | 16 (4.36) | | 66 (9.85) | 11 (2.11) | |

**Table 2**

Risk for any STI (HIV, gonorrhea, Chlamydia)

| Baseline Sexual Risk Behaviors | aOR (95% CI) | p-value |
|---|---|---|
| **Frequency of alcohol use**[†] | | |
| Never had alcohol | | |
| Male | REF | |
| Female | REF | |
| Used alcohol less than 1 time a week | | |
| Male | .190 (.050, .725) | .015 |
| Female | 3.76 (1.30, 10.9) | .014 |
| Used alcohol greater than 1 time a week | | |
| Male | .244 (.061, .980) | .047 |
| Female | 1.37 (.338, 5.55) | .661 |
| **Protected sex with casual partners in the last 3 months** | | |
| Regular partner only | REF | |
| Had protected sex half the time or greater with casual partner/s | | |
| 14–16 | 6.19 (2.58, 14.9) | .000 |
| 17–19 | 3.54 (2.07, 6.04) | .000 |
| 20–24 | 2.02 (1.21, 3.36) | .007 |
| 25–29 | 1.15 (.502, 2.65) | .738 |
| Had protected sex less than half the time with at least one casual partner | | |
| 14–16 | 22.8 (4.41, 117.5) | .000 |
| 17–19 | 6.59 (2.32, 18.7) | .014 |
| 20–24 | 1.91 (.741, 4.90) | .181 |
| 25–29 | .552 (.129, 2.36) | .661 |
| **Had any sex drunk or high in last 3 mos.** | 1.32 (.755, 2.34) | .324 |
| **Age** (14–16, 17–19, 20–24, 25–29) | .938 (.740, 1.19) | .594 |
| **Female** | .101 (.029, .352) | .000 |

Note: A multiple logistic regression model using general estimating equation methods was constructed by first including independent variables with the strongest associations with baseline STI and then adding or removing variables that improved model fit (quasi-likelihood under the independence assumption model criterion). Multicollinearity and goodness of fit were examined for the final model. Hosmer and Lemeshow's goodness-of-fit test indicated that the model fits the data well (p = .612).

aOR: adjusted odds ratio, CI: Confidence Interval.

†For this variable, frequency of alcohol use was assessed by asking, "During the past 12 months, how often did you drink alcoholic beverages?" Response options were: "None," "Once a month or less," "2–3 days a month," "About once a week," "2–3 days a week," "4–6 days a week" and "Everyday." The distribution of responses and association with STIs informed the categorization at less/more than weekly alcohol use.