

# HIV/AIDS-Related Knowledge, Attitudes And Sexual Behaviors as Predictors of Condom Use Among Young Adults in Croatia

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**CONTEXT:** Although Croatia is still in an early stage of HIV infection, the rising rates of infection in other central and eastern European countries suggest the need to understand HIV knowledge, attitudes and sexual behaviors among young adults in Croatia.

**METHODS:** Data from a multistage probability sample of 1,093 Croatians aged 18–24 surveyed in 2005 were used in regression models that examined the associations between HIV-related knowledge, attitudes and sexual behavior and predictors of condom use at first and last sexual intercourse and condom use consistency.

**RESULTS:** For both men and women, condom use at first intercourse and positive attitudes toward condom use were the most robust predictors of condom use at last intercourse and consistent condom use. In addition, for women, having peers with less traditional attitudes regarding sexuality was associated with consistent condom use (odds ratio, 1.3).

**CONCLUSIONS:** Risky sexual behaviors are common among young adults in Croatia. Pragmatic and comprehensive sex education programs should target young people before they become sexually active.

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The number of HIV infections in central and eastern Europe has increased over the last decade,<sup>1,2</sup> particularly among young people.<sup>3,4</sup> In Russia, Ukraine, Moldova and Belarus, the HIV epidemic has already become a grave public health issue.<sup>3</sup> In Estonia, Latvia and Kazakhstan, HIV rates are still relatively low but have shown a steady increase in recent years.<sup>2,3</sup>

HIV/AIDS dynamics in postcommunist Europe cannot be separated from the immense societal change and turmoil that took place after the demise of authoritarian, one-party regimes. There was rapid political and economic transformation as the socialist economy was replaced by a market system. These changes led to rising unemployment and social marginalization of the lower middle class, the collapse of public services (including the health system) and the erosion of collective norms.<sup>5</sup> These and other sociocultural, political and economic forces underlying the recent epidemic of HIV and other STIs have received scant attention; the number of studies dealing with HIV-related sexual risks in central, eastern and southeastern Europe remains low.<sup>4,6–10</sup> From the perspective of prevention policy, this is a significant obstacle.

## BACKGROUND

At the moment, the rate of HIV infection in Croatia is low and has been stable over the last 10 years; the overall HIV prevalence is less than 0.1% and an average of 15 new AIDS cases are diagnosed every year.<sup>3,4,11</sup> In total, 239 AIDS cases were registered between 1986 and 2005, with 127 deaths.<sup>11</sup> In contrast to the newly independent states of the former Soviet Union, where the HIV epidemic is driven primarily

by intravenous drug use, in Croatia, HIV is transmitted primarily through heterosexual and homosexual activity. According to national statistics, 40% of new HIV infections between 1985 and 2005 were likely caused by homosexual contact and 41% by heterosexual contact.<sup>11</sup> Only about 10% of infections were linked to the use of intravenous drugs. Among heterosexuals, migrant workers—seamen (and consequently their partners) in particular—seem to be an especially vulnerable population.<sup>12</sup> Men make up 81% of all documented AIDS cases.

In Croatia, as in the wider region, young people seem to be particularly vulnerable to HIV and other STIs: Roughly one-quarter of HIV-positive individuals in Croatia are aged 20–29.<sup>11</sup> Unfortunately, little research exists on the sexual risk-taking behavior of Croatian young people. A 1989 study, which provided the first empirical data on HIV-related sexual risk-taking, found no association between knowledge about HIV/AIDS and sexual risk-taking.<sup>13</sup> However, the study sample was not nationally representative of young adults in Croatia.

The aim of the current study is to provide a valid assessment of sexual behaviors and HIV/AIDS-related knowledge and attitudes among Croatian young adults. Using data from the first of a series of nationally representative surveys (to be conducted every five years), we focus on basic measures of knowledge, attitudes and sexual experiences in the context of a moderately developed, postcommunist society in southeastern Europe in which the political and cultural influence of the Roman Catholic Church is increasing. We analyze the knowledge, attitudinal and sexual behavior correlates of protective sexual practices. By

narrowing our analytical focus to condom use as the main barrier to HIV transmission, we aim to provide insights relevant for national HIV prevention policy.

## METHODS

### Sample

The study was based on data from a nationally representative, multistage probability sample of young men and women aged 18–24 years surveyed in February 2005. In the first stage, settlements (villages or towns; our sampling points) across the six large regions of Croatia were chosen randomly and with proportion to the number of residents aged 18–24 years. Households within the selected locations were then chosen randomly using local phone registries (approximately 95% of the Croatian population own a fixed line phone). Finally, using Kish's method, researchers chose participants from households in which more than one resident aged 18–24 was present. The response rate was 80%.<sup>\*</sup> In total, 574 young women and 519 young men were surveyed.

Since the sampling design fixed the number of respondents per region in order to enable reliable regional estimates, the analyses presented here were, with the exception of the frequency analyses presented in Tables 1–3, based on weighted data, adjusted for region and gender (women were overrepresented among those who declined to participate).

### Procedures and Questionnaire

Participants were interviewed in their homes by experienced interviewers in their 20s or early 30s. All of the interviewers attended a half-day training seminar organized by the Croatian authors of the study.

A structured questionnaire containing 242 variables in the male version and 248 variables in the female version was used. The first part of the questionnaire, the interview, included questions about social and demographic characteristics and family background, as well as questions on HIV/AIDS knowledge and attitudes. The second part of the questionnaire was self-administered and focused on sexual behaviors and experiences. The questionnaire was tested for comprehensiveness and completion time with 100 students from two secondary schools in a metropolitan area. No substantial difficulties were encountered during the testing and only minor (linguistic) corrections were made. In most cases, the questionnaire was completed in less than 30 minutes.

### Measures

The Parental Control Scale assessed parents' knowledge of what participants did outside of home (e.g., "Do your parents know your friends?") and utilized four three-point items (1=parents don't know, 2=know a little bit and 3=mostly know). The possible score ranged from four to 12, with larger numbers indicating more parental control. The mean score was 10.24 (standard deviation, 1.88; Cronbach's alpha=0.84).

The Peer Sexual Attitudes Scale consisted of six items

(which could be answered yes or no) asking about friends' opinions in regard to sex (e.g., "Most of my friends think that having a lot of sexual experience is cool"). The possible score was 0–6, with larger numbers denoting more peer support for sexually permissive behavior. The mean score was 4.5 (standard deviation, 0.83), and Cronbach's alpha was 0.60.

The Traditional Sexual Morality Scale was used to assess respondents' agreement with traditional views about human sexuality. This composite indicator consisted of six five-point Likert-type items (e.g., "Abortion can never be justified" and "In matters of sexuality, my religion is my guide"); higher scores point to more conservative views of sexual morality. Cronbach's alpha for the composite was 0.66. The possible score was 6–30; the median was 13. The scale was dichotomized into values equal to or lesser than the median (0) and values greater than the median (1).

Attitudes toward condom use were assessed by seven items, all using five-point Likert-type scales. Items either measured agreement with negative stereotypes regarding condom use (e.g., "Those who suggest condom use do not trust their partners"), confidence in the effectiveness of condoms or agreement that individuals who use condoms are responsible. The latter items were reverse coded so that higher composite scores indicated more negative attitudes. Cronbach's alpha for the composite indicator was 0.69. The range of possible scores was 1–5, with a mean of 2.08 (standard deviation, 0.64).

The HIV/AIDS Transmission and Prevention Knowledge Scale consisted of seven items concerning modes of HIV transmission (e.g., "Can HIV be transmitted by sharing food with someone who is infected?") and prevention (e.g., "Is it possible to protect oneself from HIV infection by having sex exclusively with one healthy and faithful partner?"). Respondents could designate these statements as true or false, or say they did not know. All correct answers were scored as 1; wrong and "don't know" answers were coded as 0. The range of possible scores was 0–7; the mean score was 5.38 (standard deviation, 1.63; Cronbach's alpha, 0.63).

To measure respondents' assessment of personal risk, we used two 10-point items: "In your opinion, what are the odds of your getting infected with HIV?" and "In your opinion, what are the odds of your getting infected with some other sexually transmitted disease?" Response options ranged from "the odds are infinitely small" (1) to "the odds are very high" (10). The two items, moderately strongly correlated ( $r=0.8$ ,  $p<0.001$ ), were collapsed into a new variable whose score was calculated as the mean of the two individual items. The possible range of scores for the new variable was 1–10.

Early sexual initiation was defined as the experience of sexual intercourse at age 15 or earlier. The lifetime number of sexual partners, defined as the number of people a respondent had had penile-vaginal or penile-anal intercourse

<sup>\*</sup>Fewer than one-quarter of those who refused (fewer than 5% of the total sample) stated that the topic of the study or embarrassment was their main reason for not participating.

**TABLE 1. Percentage distribution of respondents aged 18–24 in a nationally representative sample of young adults in Croatia, by selected characteristics, according to gender, 2005**

Characteristic	All (N=1,093)	Women (N=574)	Men (N=519)
<b>Age</b>			
18	13.1	14.8	11.2
19	11.6	11.0	12.3
20	14.7	16.0	13.3
21	15.2	14.1	16.4
22	13.4	13.9	12.9
23	13.7	13.8	13.7
24	18.2	16.4	20.2
<b>Currently living with parents**</b>			
Yes	83.8	80.8	87.1
No	16.2	19.2	12.9
<b>Family socioeconomic status*</b>			
<average	8.1	9.4	6.8
Average	71.5	71.3	71.9
>average	19.8	18.8	20.9
<b>Occupation*</b>			
Secondary school student	11.7	13.1	10.2
College/university student	35.9	37.1	34.5
Employed	32.9	30.5	35.6
Unemployed	19.8	19.7	19.9
<b>Attend religious services*</b>			
Never	19.2	17.1	14.5
Once in a couple of years	10.9	9.4	12.5
Several times a year	36.7	35.5	38.0
Once a month	16.5	20.2	12.3
Once a week or more	16.5	17.8	15.0
<b>Religious upbringing</b>			
No	18.6	17.2	20.0
Yes, but not strictly	71.1	71.3	70.9
Strictly	9.4	11.3	7.3
<b>Marital status*</b>			
Not married	92.6	90.8	94.6
Married	5.2	7.0	3.3
Cohabiting	1.8	1.9	1.7
Divorced	0.4	0.3	0.4
<b>Size of settlement in which respondent resided for the longest period of time*</b>			
≤10,000	54.0	51.2	57.0
10,001–50,000	17.1	15.7	18.7
50,001–100,000	8.1	8.5	7.7
100,001–500,000	10.2	11.0	9.2
>500,000	9.8	12.2	7.1
<b>Sexually experienced</b>			
Yes	84.8	82.8	87.1
No	14.8	16.8	12.9
Total	100.0	100.0	100.0

\*Percentage for women significantly different from percentage for men at  $p < .05$ .  
 \*\*Percentage for women significantly different from percentage for men at  $p < .01$ .  
 Note: Percentages may not total 100% because of rounding or missing cases.

with, was dichotomized because of its extremely skewed distribution. We coded respondents with three or fewer partners as 0 and those with four or more sexual partners as 1.

We utilized three single-item indicators as measures of sexual behavior that is protective against HIV infection. These measures used the following wording: “At first sexual intercourse, did you and your partner use a condom?”; “At most recent sexual intercourse, did you and your part-

ner use a condom?” and “Thinking about all of the times that you had sexual intercourse (penile-vaginal or penile-anal) over the last 12 months, how often did you use condoms? (six-point scale: 0=had no sex in the preceding year, 1=never, 2=rarely, 3=sometimes, 4=often and 5=always).”

We applied the chi-square test to assess gender differences in social, demographic and behavioral indicators. Multiple logistic regression models were used to identify variables associated with HIV-protective sexual behaviors.

**RESULTS**

**Descriptive Findings**

Most participants (84%) were still living with their parents at interview, although about half were no longer students (Table 1). The gender difference in proportion of participants living with their parents (81% of females and 87% of males) reflects the fact that young women were more likely than young men to be married at interview (7% vs. 3%). Gender differences were also found in family socioeconomic status and participants’ occupation: Young women tended to report lower family socioeconomic status and less employment than did young men. Most of the participants had already had sexual intercourse (85% of the overall sample); a lower proportion of young women than of young men reported sexual experience (83% vs. 87%).

**Knowledge**

Overall, the proportions of respondents providing correct answers to individual HIV knowledge questions varied from 64% to 86% (not shown). One-third of the sample answered all seven questions correctly; 25% of respondents provided six correct answers and 17% provided five. There was a significant gender difference in mean scores ( $t=2.3, p<.05$ ); on average, women scored higher (mean, 5.5; standard deviation, 1.6) than men (mean, 5.3; standard deviation, 1.7). Similar proportions of men and women answered individual questions correctly in all but one case: a significantly higher proportion of women than of men knew that it is not possible to acquire HIV from a mosquito bite. Neither religious upbringing nor frequency of church-going was associated with the level of HIV knowledge.

**Attitudes**

The average scores on the Traditional Sexual Morality Scale indicate that overall, this sample had fairly liberal values—for both men and women, the mean score was 1.9 (standard deviation for each, 0.7; not shown). The majority of respondents disagreed with five of the six statements that reflected traditional views of sexuality, including one on religion being one’s guide in sexual matters (rejected by 74% of respondents; Table 2). The only exception was the item concerning same-sex marriage rights: a majority of men (59%), but not women (39%), opposed the idea.

Positive attitudes toward condom use are prevalent among young adults in Croatia. The majority of respondents (55–73%) disagreed with negative stereotypes about condom use and, in even greater proportions, agreed with pos-

**TABLE 2. Percentage distribution of responses to questions on traditional morality and beliefs about condoms, by question, according to gender**

Question	All			Women			Men			Total
	Disagree	Don't know	Agree	Disagree	Don't know	Agree	Disagree	Don't know	Agree	
<b>Traditional morality</b>										
Premarital sex is unacceptable	87.9	5.8	5.2	87.6	5.9	5.6	88.2	5.6	4.8	100.0
Abortion can never be justified*	55.9	17.1	26.0	60.1	14.1	25.1	51.3	20.4	27.0	100.0
Homosexual persons should have the right to marry***	48.0	22.1	28.9	38.5	24.6	36.2	58.6	19.5	20.8	100.0
Masturbation is not a sin	16.4	16.3	66.3	16.2	17.8	65.3	16.6	14.6	67.4	100.0
Sex is not morally acceptable if it is all about pleasure	65.0	20.0	13.8	65.7	19.2	14.3	64.2	21.0	13.3	100.0
In matters of sexuality, my religion is my guide	74.0	16.3	8.4	73.5	15.0	10.6	74.6	17.7	6.0	100.0
<b>Beliefs about condoms</b>										
Condoms are efficient in preventing pregnancy*	8.8	5.7	84.8	10.6	4.9	84.0	6.7	6.6	85.7	100.0
People who use condoms are very responsible	8.9	12.2	77.9	8.9	12.0	78.2	8.9	12.3	77.5	100.0
Condoms offer good protection against STIs	9.5	9.1	80.4	9.4	8.2	81.7	9.6	10.2	98.8	100.0
It is promiscuous people who suggest using a condom***	54.9	26.5	17.5	59.4	26.0	13.6	49.9	27.2	21.8	100.0
Men who have success with women do not use condoms	58.1	28.5	12.4	56.6	31.7	10.8	50.7	25.0	14.1	100.0
Those who suggest condom use do not trust their partners*	72.9	16.5	9.8	76.1	14.6	8.7	69.4	18.5	11.0	100.0
A young women who carries condoms in her purse is easy***	64.0	18.0	17.1	72.3	15.9	11.3	54.7	20.4	23.5	100.0

\*Percentage distribution for women significantly different from percentage for men at  $p < .05$ . \*\*Percentage distribution for women significantly different from percentage for men at  $p < .01$ . \*\*\*Percentage distribution for women significantly different from percentage for men at  $p < .001$ . Notes: Percentages may not total 100% because of rounding and missing cases. The categories "disagree" and "agree" include "strongly" responses.

itive statements (78–85%). For four out of seven items, a significant gender difference was found; on three of these, women expressed more positive attitudes than men. However, in response to a statement that condoms are an efficient method of pregnancy prevention, higher proportions of women than men expressed doubt.

Attitudes toward condom use had a moderate association with the traditional morality scale ( $r = 0.3$ ,  $p < .001$ ; not shown). Attitudes were not correlated with religiosity, but were associated with having had a religious upbringing ( $F = 5.0$ ,  $p < .01$ ). Significantly more positive attitudes toward condoms and condom use were espoused by respondents who reported no religious upbringing.

Interestingly, we found a positive association between attitudes toward condoms and scores on the HIV knowledge scale ( $r = -0.2$ ,  $p < .001$ ); respondents with more positive attitudes toward condoms and condom use tended to have greater HIV knowledge.

### Sexual Behaviors and Experiences

Among participants who reported that they had had sexual intercourse, the median age at first intercourse was 17 for both men and women (not shown), with an average age of 17.0 for men (standard deviation, 1.7) and 17.6 for women (standard deviation, 1.7). A significantly higher proportion of young women than of young men reported that they had started having sex "too early," but the overall majority of participants (73%) did not share this feeling.

As expected, the proportion of respondents reporting condom use at first intercourse was higher than the proportion reporting it at last intercourse (60% vs. 52%; Table

3, page 62). Overall, one-fifth of respondents reported consistent condom use during sexual intercourse in the last 12 months. Most, however, did not use condoms during oral sex: Some 74% of those who reported having oral sex in the last 12 months had never used condoms during the activity (not shown).

Men reported more cumulative sexual partners than did women, both in the last 12 months and in their lifetime, as well as more partners with whom they engaged in oral sex only (not shown). On average, men reported 5.7 lifetime sexual partners (median, 4; standard deviation, 5.8) and women 3.5 (median, 2; standard deviation, 3.5). A similar pattern was found for the number of sexual partners in the past year. In addition, men were more likely than women to have had concurrent sexual relationships and one-night stands in the last 12 months. Almost one-quarter of participants reported concurrent relationships.

The likelihood of being diagnosed with a STI also differed between genders. Women were more likely than men to report previous STI diagnoses (13% vs. 3%).

### Condom Use at First and Last Intercourse

For women, only one variable—a high moral traditionalism score—predicted whether women had used a condom at first sexual intercourse (Table 4, page 63). Women who were more traditional had lower odds of having used a condom at first sex than did those who were less traditional (odds ratio, 0.5). For men, a high parental control score was associated with elevated odds of condom use at first intercourse (odds ratio, 1.2); earlier sexual initiation was associated with reduced odds (0.4).

**TABLE 3. Percentage distribution of sexually experienced respondents who reported selected sexual behaviors and experiences, by gender**

Behavior	All (N=927)	Women (N=475)	Men (N=452)
<b>Age at 1st intercourse***</b>			
≤14	4.0	2.3	5.7
15	6.9	5.3	8.6
16	19.4	18.7	20.1
17	25.2	25.5	25.0
18	19.2	16.4	22.1
19	10.9	14.3	7.3
≥20	10.8	14.3	6.7
<b>Protection at 1st intercourse</b>			
None	21.0	20.7	21.3
Withdrawal*	13.4	15.0	11.6
Condom	59.9	57.9	62.0
Pill	2.3	2.5	2.0
Other	0.7	0.6	0.8
<b>Protection at last intercourse</b>			
None	22.1	22.7	21.4
Withdrawal**	12.3	15.0	9.4
Condom***	51.6	43.3	60.3
Pill***	10.5	15.0	5.8
Other	1.9	2.7	1.2
<b>Frequency of condom use in last 12 mos.*</b>			
Never	17.4	21.2	13.4
Rarely	21.5	20.8	22.3
Sometimes	16.1	17.7	14.4
Often	22.9	20.3	25.7
Always	22.1	20.0	24.3
<b>Lifetime no. of sex partners***</b>			
1	22.2	31.6	12.4
2	15.4	18.9	11.7
3	13.3	12.0	14.6
4–6	23.0	19.6	26.6
7–10	10.8	8.6	12.9
>10	6.9	3.0	10.9
<b>No. of sex partners in last 12 mos.***</b>			
0	8.8	8.8	8.8
1	55.7	65.1	45.8
2–3	24.0	18.7	29.6
4–6	6.1	2.7	9.5
≥7	1.2	0.6	2.0
<b>One-night stands in last 12 mos.***</b>			
Yes	29.8	21.7	38.3
No	70.2	78.3	61.7
<b>Ever diagnosed with STI***</b>			
Yes	8.5	13.4	3.2
No	91.5	86.6	96.8
<b>Ever tested for HIV</b>			
Yes	5.4	4.2	6.6
No	94.6	95.8	93.4
Total	100.0	100.0	100.0

\*Percentage for women significantly different from percentage for men at p<.05.  
 \*\*Percentage for women significantly different from percentage for men at p<.01.  
 \*\*\*Percentage for women significantly different from percentage for men at p<.001. Notes: Percentages may not total 100% because of rounding and missing cases. Chi-square tests were used for all gender comparisons except for age at 1st intercourse, for which a t test was used.

The strongest predictor of condom use at last intercourse for both men and women was whether they had used a condom at first intercourse. This effect was particularly evident for women: Those who reported having used a condom dur-

ing their first sexual experience were significantly more likely than those who did not to report having used a condom during their most recent sexual encounter (odds ratio, 3.4). For both women and men, only one other variable—attitudes toward condoms—was significant. Young adults who held more negative attitudes toward condom use were less likely than those who held more positive attitudes to have used a condom at last intercourse (0.5).

For men, partner type (casual vs. steady) was not associated with the odds of condom use at last intercourse (not shown). In comparison, women were more likely to report using condoms at last intercourse with a casual partner than with a steady partner ( $\chi^2=4.34$ ,  $df=1$ ,  $p<.05$ ). In multiple logistic regression analyses predicting condom use at last intercourse separately by partner type, condom use at first intercourse and positive attitudes toward condom use featured again as significant predictors for both sexes.

**Consistent Condom Use**

As with condom use at last intercourse, the best predictor of current consistent condom use was whether respondents had used a condom during their first sexual experience (Table 5). The odds of reporting consistent condom use in the past year were more than five times as high among those who had used a condom at first sexual intercourse as among those who had not. A second predictor was attitudes toward condoms. Young men and women who held less positive attitudes toward condoms were less likely to report consistent condom use (odds ratios, 0.6 and 0.4, respectively). For women, one additional variable—peer sexual attitudes—was significant. Women who reported that their friends held less traditional attitudes toward sex were more likely than those whose friends held more traditional attitudes to report consistent condom use (1.3). Overall, the logistic regression model predicting consistent condom use correctly classified 79% of female and 73% of male participants.

**DISCUSSION**

The central aim of this study was to identify predictors of condom use in a nationally representative sample of young Croatian men and women. We assessed a range of possible predictors, including family and peer influences, knowledge and attitudes related to HIV/AIDS and condoms, and sexual history variables. Our findings are broadly consistent with previous literature in suggesting that knowledge about HIV/AIDS and an individual’s perceived risk of HIV infection have marginal effects on heterosexual condom use, whereas attitudes toward condoms and previous condom use are strong predictors.<sup>14</sup> Although the best predictors of condom use in our study were important for both young women and young men, we did find some interesting gender-specific predictors.

**Predictors of Condom Use**

Although the international trend of increased condom use<sup>15,16</sup> has also been apparent in Croatia,<sup>17</sup> condoms are used inconsistently at best.<sup>10,18</sup> In comparison to 1989, when

**TABLE 4. Odds ratios (and 95% confidence intervals) from logistic regression analysis to identify associations between selected characteristics and condom use at first and last intercourse, by gender**

Characteristic	Condom used at first intercourse		Condom used at last intercourse	
	Women (N=318)	Men (N=322)	Women (N=313)	Men (N=316)
Parental control (4–12)	1.14 (0.98–1.32)	1.17 (1.04–1.32)	0.95 (0.81–1.11)	1.05 (0.93–1.20)
Peer sexual permissiveness (0–6)	0.95 (0.81–1.11)	0.85 (0.71–1.01)	1.05 (0.89–1.24)	1.01 (0.85–1.21)
Moral traditionalism (6–30)	0.45 (0.26–0.77)	1.42 (0.84–2.38)	1.64 (0.93–2.88)	1.51 (0.88–2.63)
Negativity toward condoms (1–5)	1.08 (0.73–1.61)	0.83 (0.56–1.24)	0.47 (0.31–0.73)	0.48 (0.32–0.73)
HIV knowledge (0–7)	0.99 (0.84–1.16)	1.03 (0.88–1.19)	0.91 (0.77–1.08)	1.05 (0.90–1.22)
Perceived personal risk (1–10)	na	na	1.00 (0.94–1.07)	1.03 (0.95–1.10)
Sexual initiation at ≤age 15	0.52 (0.22–1.25)	0.44 (0.24–0.84)	0.50 (0.19–1.35)	0.93 (0.46–1.90)
Condom use at 1st intercourse	na	na	3.40 (1.96–5.90)	2.97 (1.78–4.95)
Lifetime no. of sex partners	na	na	1.32 (0.75–2.32)	1.30 (0.78–2.19)

Notes: Includes only those respondents who were sexually active in the last 12 months. Numbers in parentheses following characteristic are the possible range of scores; level of the characteristic rises with score. Odds ratios are per unit increase in score for the characteristic and reflect the participant's odds of having used a condom at first and last intercourse, respectively. na=not applicable.

only 5% of Croatian women and men in the 16–30 age-group reported that they always used condoms,<sup>13</sup> 22% of the current sample reported consistent condom use in the last 12 months.

For condom use at last intercourse, the strongest predictors for both men and women were positive attitudes toward condom use and whether condoms had been used during their first sexual experience. Several studies, including an earlier study of Croatian high-school students,<sup>10</sup> have found that previous condom use—especially at first sexual intercourse—is a strong predictor of future condom use.<sup>14</sup> This finding suggests that condom use could be considered a habitual behavior.<sup>19</sup> The link between condom use during early sexual experiences and later condom use underlines the importance of providing comprehensive sex education to young people before they become sexually active.

Predictors of consistent condom use in the past year were almost identical to those found for condom use at last intercourse. For both genders, condom use at first intercourse and attitudes toward condoms were associated with consistent condom use. In addition, there was one gender-specific predictor: peer attitudes toward sexuality. Young women who perceived that their peers had more liberal and permissive sexual views were more likely than those who perceived their peers as less liberal to report always using condoms. This finding may reflect the fact that these women (and their peers) are more open about having sex and have had more sexual partners and experience but are nonetheless having protected sex. Because they are more open and positive about sex, these women could also be more likely to discuss condom use with their partners. As Sheeran and colleagues note, communication about condom use with a partner is strongly linked with actual use.<sup>14</sup>

In light of the significance of condom use at first sexual intercourse, it is important to identify factors that increase the odds of condoms being used at sexual initiation. Our analysis pointed to only three predictors, all of them gender-specific. Women who were less accepting of traditional views were more likely to have used a condom during their first sexual experience. In a recent study involving male and female university students in Croatia,<sup>20</sup> those

holding more traditional attitudes toward sexuality were less knowledgeable about sex and used contraceptives less frequently than their less traditional peers. For men, a higher level of parental control and an older age at first intercourse significantly increased the odds of condoms being used at first intercourse. This finding supports previous reports on the link between early sexual debut and sexual risk-taking.<sup>10,15,21</sup>

Although very few studies have explored the relation between personality factors and safer sex behavior,<sup>14</sup> it is likely that personality variables influence the degree to which individuals plan to use contraceptives before becoming sexually active. One study in support of this idea demonstrated that more erotophilic individuals (that is, those who feel less guilt about sex, discuss it more openly and have more positive attitudes toward sexually explicit materials) were more likely to initiate discussion with a partner about condom use.<sup>22</sup> Future studies should further explore the links between personality traits and sexual behavior.

#### Limitations

Reported findings are limited by the validity of self-report and by possible recall biases. The latter might have been a particular problem with the indicators related to past events or circumstances. Our assessment of condom use was also fairly limited. We asked about condom use at first and last

**TABLE 5. Odds ratios (and 95% confidence intervals) from logistic regression analysis to identify associations between selected characteristics and consistent condom use in the last 12 months, by gender**

Characteristic	Women (N=309)	Men (N=311)
Parental control (4–12)	1.01 (0.83–1.25)	1.01 (0.88–1.16)
Peer sexual permissiveness (0–6)	1.27 (1.02–1.57)	1.08 (0.89–1.30)
Moral traditionalism (6–30)	1.27 (0.61–2.62)	0.74 (0.41–1.36)
Negativity toward condoms (1–5)	0.35 (0.19–0.63)	0.63 (0.40–0.99)
HIV knowledge (0–7)	0.85 (0.69–1.05)	1.05 (0.88–1.25)
Perceived personal risk (1–10)	0.96 (0.87–1.05)	0.93 (0.85–1.02)
Sexual initiation at ≤age 15	0.57 (0.12–2.61)	0.71 (0.29–1.71)
Condom use at 1st intercourse	5.01 (2.13–11.78)	5.49 (2.71–11.14)
Lifetime no. of sex partners	0.76 (0.37–1.58)	0.99 (0.57–1.72)

Notes: Numbers in parentheses following characteristic are the possible range of scores; level of the characteristic rises with score. Odds ratios are per unit increase in score for the characteristic and reflect the participant's odds of having used condoms consistently in the last 12 months.

sex, and about the consistency of use in the last 12 months, which also relied on accurate recall.<sup>23,24</sup> We did not assess condom use errors; therefore, our measures of condom use do not establish whether participants were using condoms correctly.<sup>23</sup>

### Implications

Because of a history of low HIV incidence and prevalence, the HIV/AIDS epidemic has received relatively little attention in the Croatian media since the end of the 1980s. Generally, it has been seen as a low priority in public health discussions, resulting in the absence of nationwide preventive efforts. This is probably one of the main reasons for a slight but significant decline in HIV knowledge among young Croatian adults.<sup>25</sup> Given the lack of data on HIV and STI risks among sex workers and men who have sex with men in Croatia,<sup>26</sup> as well as the high prevalence of hepatitis B and C among the growing population of intravenous drug users,<sup>27</sup> the lack of preventive efforts is particularly worrying in light of the data reported in this paper. Our findings point to a fairly high prevalence of potentially risky sexual behavior in this nationally representative sample of young adults.

The introduction of school-based health education that includes a module on sexuality has generated heated controversy in the media and public forums of Croatia. At the center of this widely publicized debate are the proponents of an abstinence-only program, which has received full support of the Croatian Roman Catholic Church, and backers of a comprehensive approach to sex education. Implementing a pragmatic and comprehensive sex education curriculum will not be an easy task. In 2005, the only existing HIV prevention program available in Croatia, a peer-based intervention designed for high schools, was criticized by the Croatian Bishops' Congregation as promoting condom use, which led a number of schools to drop it. However, abstinence-only programs have not proven effective;<sup>28-32</sup> thus HIV and STI prevention programs in Croatia need to adopt a different approach. A comprehensive approach would promote sexual responsibility and, at the same time, improve young people's understanding of sexual health risks and provide them with necessary behavioral and communication skills.

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## RESUMEN

**Contexto:** Si bien Croacia aún se encuentra en una etapa incipiente de propagación de la infección por el VIH, el aumento de las tasas de esta infección en otros países de Europa central u oriental indican que es necesario difundir el conocimiento sobre esta infección por el VIH, así como las actitudes y conductas que los jóvenes adultos de Croacia deben observar al mantener relaciones sexuales.

**Métodos:** Se utilizaron datos de un muestreo de probabilidades en diversas etapas, de 1.093 croatas de 18-24 años de edad encuestadas en 2005, para construir modelos de regresión que examinaron las relaciones entre el conocimiento sobre la infección por el VIH, las actitudes y la conducta sexual y las variables de predicción sobre el uso del condón durante la primera y última relación sexual y el uso congruente de este método.

**Resultados:** En ambos grupos de hombres y mujeres, el uso del condón durante la primera relación sexual y la actitud positiva con respecto al uso de este método fueron las variables de predicción más sólidas con respecto al uso del condón durante la última relación sexual y el uso congruente de este método. Además, entre las mujeres, haber tenido compañeras que tuvieran actitudes menos tradicionales con respecto a la sexualidad fue una causal que estuvo relacionada con el uso congruente del condón (coeficiente de probabilidades, 1,3).

**Conclusiones:** La conducta sexual riesgosa es común entre los jóvenes adultos de Croacia. Antes de que este grupo de jó-

venes se vuelva sexualmente activo es necesario contar con programas pragmáticos e integrales sobre educación sexual que estén dirigidos a este grupo etario.

## RÉSUMÉ

**Contexte:** Bien que la Croatie en soit encore au stade précoce de propagation du VIH, les taux d'infection croissants dans les autres pays d'Europe centrale et orientale laissent entendre la nécessité de cerner la connaissance, les attitudes et les comportements sexuels des jeunes adultes croates à l'égard du virus.

**Méthodes:** Les données d'un échantillon probabiliste à plusieurs degrés de 1.093 Croates âgés de 18 à 24 ans interrogés en 2005 ont été utilisées dans des modèles de régression pour examiner les associations entre la connaissance, les attitudes et les comportements sexuels relatifs au VIH et les prédicteurs d'usage du préservatif aux premiers et derniers rapports sexuels et d'usage régulier du préservatif durant les 12 mois précédents.

**Résultats:** Pour les hommes comme pour les femmes, l'usage du préservatif aux premiers rapports sexuels et les attitudes positives à l'égard de la méthode se sont révélés les prédicteurs les plus solides d'usage aux derniers rapports et d'usage régulier. Côté femmes, le contact avec des pairs présentant des attitudes moins traditionnelles à l'égard de la sexualité était aussi associé à un usage régulier du préservatif (rapport de probabilités, 1,3).

**Conclusions:** Les comportements sexuels risqués sont courants parmi les jeunes adultes de Croatie. Des programmes d'éducation sexuelle pragmatiques complets doivent cibler les jeunes avant qu'ils ne deviennent sexuellement actifs.

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