

An Assessment of HIV/STI Vulnerability and Related Sexual Risk-Taking in a Nationally Representative Sample of Young Croatian Adults

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Abstract Despite the recent increase in the number of HIV infections in Central and Eastern Europe, patterns of sexual behavior have not been extensively researched, particularly among young people. The aim of the present study was to provide a comprehensive assessment of HIV/AIDS-related vulnerability and sexual risk-taking among young adults in Croatia. Data were collected in 2005 using a nationally representative, multi-stage stratified probability sample ($n = 1,093$) of women and men aged 18–24 years. The focus in this article was on predictors of sexual risk-taking measured by a composite risky sexual behaviors scale. Using hierarchical regression models, we analyzed gendered effects of community, family, peer group, and individual level factors. For both men and women, peer pressure, sensation seeking, personal risk-assessment, behavioral intention, condom use at first sexual intercourse, and sexual victimization were significant predictors of sexual risk-taking behaviors. A number of predictors were gender-specific: sexual assertiveness and condom self-efficacy for women and parental monitoring, traditional morality, HIV knowledge, and talking about sex

with partner for men. Documenting substantial prevalence of potentially risky sexual behaviors among young people in Croatia, the findings call for prevention and intervention efforts that should focus on individual capacity building for responsible sexual behavior.

Keywords HIV · STI · Sexual risk taking · Young adults · Gender · Vulnerability · Croatia

Introduction

Sexually transmitted infections (STI), including human immunodeficiency virus (HIV), pose significant health risks and threats to future fertility for young people (Centers for Disease Control and Prevention, 2004; Eng & Butler, 1997). In the U.S., about half of new HIV infections are among individuals under 25 years old, with the majority infected through sexual behavior (Healthy People, 2006). Although representing only 25% of the ever sexually active population in the U.S., 15–24 year olds account for nearly half of all newly acquired STIs (Weinstock, Berman, & Cates, 2004). In the U.K., STI rates have risen dramatically in young men and women aged 16–19 years in recent years (HIV and Sexually Transmitted Infections Department, 2004).

There has been a similar well-documented increase in the number of HIV infections in Central and Eastern Europe over the last decade (Dehne, Khodakevich, Hamers, & Schwartlander, 1999; UNDP, 2004), particularly among young people (Kelly & Amirkhanian, 2003; Novotny, Haazen, & Adeyia, 2003). In Russia, Ukraine, Moldova, and Belarus, the HIV epidemic has already become a grave public health issue with regional implications (Kelly & Amirkhanian, 2003). In Estonia, Latvia, and Kazakhstan, HIV rates are still

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relatively low but have shown a steady increase in recent years (Kelly & Amirkhani, 2003; UNDP, 2004).

Recent HIV/AIDS dynamics in post-communist Europe cannot be separated from the immense societal change and turmoil that took place after the demise of authoritarian, one-party regimes. These changes included rapid political and economic transformation, the latter being characterized by the replacement of command economy with an institutionally poorly equipped market system. Associated with these were a variety of transition costs, ranging from rising unemployment and “pauperization” of the former middle class to the collapse of public services (including the health system) and psychological costs of eroding collective norms (Štulhofer & Sandfort, 2005). Unfortunately, due to the lack of any tradition of sex research in post-communist countries (with the Czech Republic being a notable exception), these and other sociocultural, political, and economic forces behind the recent HIV/STI epidemic have received only scant attention (Amirkhani, Tiunov, & Kelly, 2001; Bibikian et al., 2004; Novotny et al., 2003; Roura, 2005; Takacs et al., 2006).

Background: The Case of Croatia

At the moment, Croatia is among the countries that are in an early stage of HIV infection (Kelly & Amirkhani, 2003; Novotny et al., 2003). HIV rates of infection are low and rather stable in the last 10 years with an average of 15 new AIDS patients diagnosed every year (CNIPH, 2006) and an overall HIV prevalence of less than 0.1 percent (Kelly & Amirkhani, 2003). In total, 239 AIDS cases were registered in the period from 1986–2005, with 127 deaths. In contrast to the newly independent states of the former Soviet Union, where the HIV epidemic is primarily intravenous drug use (IDU) driven, in Croatia, HIV transmission is primarily through heterosexual and homosexual activity. According to the national statistics, 40% of HIV infections during the 1985–2005 period were likely caused by homosexual contact and 41% by heterosexual contact (CNIPH, 2006). Only about 10% of infections were linked to IDU. Among the heterosexual group, migrant workers—seamen in particular (and their partners)—seem to be an especially vulnerable population (Štulhofer, Brouillard, Nikolić, & Greiner, 2006). Men comprise 80.5% of all documented AIDS cases.

The process of post-communist transition in Croatia was aggravated by the 1991–1995 war, following the break-up of Yugoslavia, which resulted in internal and external migrations and refuge. One of the consequences of the war and the process of ethno-national identification and homogenization, promoted by the war-time right-wing and authoritarian government, was a gradually increasing influence of the Catholic church, reflecting, among other things, in the

introduction of religious education in primary and secondary schools during the second half of the 1990s. Abortion, however, remained legal and contraception widely available. The fact that most Croats identify as Catholics can be misleading as, particularly in the case of young and educated urban generations, we find it is a rather secular type of religiosity capable of blending effortlessly with the global, sexually permissive culture (Štulhofer, Anterić, & Slošar, 2004). This permissiveness is partially a legacy of the relatively liberal brand of Yugoslav communism—which, at least since the 1970s, allowed for extensive traveling to the West (including economic migrations) and extensive import of the Western popular culture—and partially the consequence of the socioeconomic openness prompted by booming tourism.

As in the wider region, young people in Croatia seem to be particularly vulnerable to HIV/AIDS and other STI. Roughly one quarter of HIV-positive individuals in Croatia belong to the 20–29 age group (CNIPH, 2006). Unfortunately, little research on sexual risk-taking behavior of young people exists. Of the few previous studies, most had numerous methodological problems, such as inadequate sampling strategies, problematic data collection procedures (e.g., uncontrolled classroom surveying), and limited statistical analyses (Štulhofer, 2004), offering only very fragmented and non-generalizable conclusions into phenomena of interest (Kuzman, Mimica, Mardešić, Mušković, & Kožul, 2002; Power & Mimica, 1999). A notable exception was the 1989 study *AIDS and Youth* (Ajduković, Ajduković, & Prišlin, 1991), designed and carried out at the peak of the national HIV/AIDS prevention campaign, which followed the discovery of the first AIDS case in the former Yugoslavia in the mid 1980s. Its findings pointed to a worrying lack of association between knowledge about HIV/AIDS and sexual risk-taking, prompting Ajduković et al. to suggest the introduction of systematic and comprehensive sex education. Although this study was a considerable improvement on previous ones, the sample was not nationally representative of young people (16–30); particularly underrepresented were out-of-school youth, both unemployed and employed.

The aim of the current study was to provide an accurate and updated assessment of HIV/AIDS related vulnerability and sexual risk-taking among Croatian youth. The study was designed to be the first in a series of studies regarding HIV/AIDS related knowledge, attitudes, beliefs, and sexual practices that could inform national HIV prevention. The study will be repeated every 5 years in order to identify trends and, potentially, to evaluate future educational programs and informational campaigns. Data collection was carried out in February 2005 as a part of a 3-year national program in HIV/AIDS prevention and capacity building supported by the Global Fund.

In this article, we focus on predictors and correlates of health-adverse sexual behaviors. In the process, we try to elucidate the relative influence of family, peer group, interpersonal (dyadic), and intrapersonal factors. We also explore gendered patterns of HIV/AIDS and STI vulnerability, sexual risk-taking, and protective sexual decisions. Following others (Aggleton, Ball, & Mane, 2000; Malinowska-Sempruch, 2004), we make a distinction between “vulnerability” and sexual risk-taking. By vulnerability, we refer to the often-overlooked importance of external or “exogenous” factors, such as socioeconomic and socio-cultural conditions, that impact young people’s sexual behavior. Cultural (Braithwaite & Thomas, 2001; Dowsett et al., 1998; Robinson, Scheltema, & Cherry, 2005) and economic (Rani & Lule, 2004; Robinson et al., 2005) constraints heighten vulnerability in certain groups and individuals. By limiting an individual’s capacity to make healthy and responsible decisions—raising the odds of their participation in risky behaviors—vulnerability is associated with poor health outcomes (Malinowska-Sempruch, 2004). In contrast, the concept of sexual risk-taking often ignores sociocultural context and related individual embeddedness. Essentially, it focuses on intrapersonal and, sometimes, interpersonal processes (cognition, deliberation, negotiation). Based on certain assumptions about individual rationality and informed decision-making, various behavioral change models (King, 1999) emphasize the stages in individual decision-making. Clearly, both approaches have strengths and weaknesses. While the “individualistic fallacy” of rational choice approaches to HIV/AIDS risk ignore contextual factors of power, social norms, obligations, and survival strategies, the “deterministic fallacy” of the vulnerability approach often overlooks the fact that there is no uniform (universal) trajectory that propels all vulnerable individuals to the same outcome. In that sense, we felt the need to use and combine both approaches, both on a theoretical and methodological level, particularly since our analyses dealt with a specific cultural setting, one of a moderately developed, post-communist European society.

Method

Participants

The study was carried out on a nationally representative, multi-stage stratified probability sample ($n = 1,093$) of young men and women aged 18–24 years in February 2005. Firstly, according to the cross-sectional sample design, the settlements (sampling points) across six large regions of Croatia were chosen randomly and proportionally to size (i.e., number of residents aged 18–24 years). Secondly, households within the selected locations were

chosen randomly using the census. Finally, by using the most recent birthday method, participants were chosen within households in which more than one resident aged 18–24 was present (Kish, 1965).

Procedure

Participants were interviewed in their homes or, in rare cases, at some other nearby public place (library, coffee shop, etc.) where it was possible to conduct the interview without the presence of other family members. Interviewers were young women and men in their 20s or early 30s, with considerable experience of interviewing for one or more national research firms. All interviewers received an additional six hours training focused on interviewing young people on sensitive topics. Face-to-face interviewing was used for the first part of the questionnaire (questions on knowledge, attitudes and beliefs), while the second part of the questionnaire (sexual behaviors and other relevant experiences) was self-administered.

The overall participation rate was 80%. When analyzing reasons given for refusal, we found that less than one quarter (<5% of total sample) of those who refused gave the topic of the study and/or embarrassment as their main reason for not participating. Common reasons for not participating were lack of time or being disinterested in any type of survey. Women (54.1%) and persons living in rural settlements (57.1%) were over-represented among the refusals.

It should be noted that the number of participants was set equal for all six regions, regardless of their varied size, in order to enable reliable regional estimates. Therefore, all the analyses presented in this article, except for frequency analyses presented in Tables 1 and 2, were based on weighted data, adjusted for region and gender.

Measures

We used a KAPB (knowledge, attitudes, beliefs, and practices) structured questionnaire containing 242 variables in the male version and 244 variables in the female version. The first part of the questionnaire included sociodemographic information and questions on family background, together with knowledge about HIV/AIDS, attitudes toward people living with HIV/AIDS, attitudes toward gendered sexual roles, beliefs about condoms and condom use, acceptance of sexual myths, etc. Data on sensation seeking, locus of control, and self-esteem were also collected. The second part of the questionnaire focused on sexual behavior and other relevant experiences (including sexual victimization). The questionnaire was piloted for comprehensiveness and completion time with 100 students from two metropolitan secondary schools. On average, both parts of the questionnaire were completed in less than half an hour.

Table 1 Sociodemographic characteristics of the sample by gender

	Women (<i>n</i> = 574) <i>n</i> (%) ^a	Men (<i>n</i> = 519) <i>n</i> (%) ^a	Total (<i>n</i> = 1093) <i>n</i> (%) ^a
Age			
18	85 (14.8)	58 (11.2)	143 (13.1)
19	63 (11.0)	64 (12.3)	127 (11.6)
20	92 (16.0)	69 (13.3)	161 (14.7)
21	81 (14.1)	85 (16.4)	166 (15.2)
22	80 (13.9)	67 (12.9)	147 (13.4)
23	79 (13.8)	71 (13.7)	150 (13.7)
24	94 (16.4)	105 (20.2)	199 (18.2)
Lived with both parents until the age of 18			
Yes	499 (86.9)	453 (87.3)	952 (87.1)
Currently living with parents**			
Yes	464 (80.8)	453 (87.1)	916 (83.8)
Mother's education			
Primary school	93 (16.2)	101 (19.4)	194 (17.7)
Secondary school	371 (64.6)	314 (60.5)	685 (62.2)
College/university	106 (18.5)	102 (19.7)	208 (19.0)
Father's education			
Primary school	74 (12.9)	50 (9.7)	124 (11.4)
Secondary school	394 (68.6)	373 (71.9)	767 (70.2)
College/university	96 (16.7)	86 (16.6)	182 (16.7)
Family SES*			
Less than average	54 (9.4)	35 (6.8)	89 (8.1)
About average	409 (71.3)	373 (71.9)	782 (71.5)
Better than average	108 (18.8)	108 (20.9)	216 (19.8)
Participant's occupation*			
Secondary school student	75 (13.1)	53 (10.2)	128 (11.7)
College/university student	213 (37.1)	179 (34.5)	392 (35.9)
Employed	175 (30.5)	185 (35.6)	360 (32.9)
Unemployed/housekeeper	113 (19.7)	103 (19.9)	216 (19.8)
Raised religiously at home			
No	99 (17.2)	104 (20.0)	203 (18.6)
Yes, but not strictly	409 (71.3)	368 (70.9)	777 (71.1)
Strictly	65 (11.3)	38 (7.3)	103 (9.4)
Participant's attendance of religious services*			
Never	98 (17.1)	112 (14.5)	210 (19.2)
Once in a couple of years	54 (9.4)	65 (12.5)	119 (10.9)
Several times a year	204 (35.5)	197 (38.0)	401 (36.7)
Once a month	116 (20.2)	64 (12.3)	180 (16.5)
Once a week or more often	102 (17.8)	78 (15.0)	180 (16.5)
Marital status*			
Not married	521 (90.8)	491 (94.6)	1012 (92.6)
Married	40 (7.0)	17 (3.3)	57 (5.2)
Cohabiting	11 (1.9)	9 (1.7)	20 (1.8)
Divorced	2 (.3)	2 (.4)	4 (.4)
Size of the settlement in which participant resided for the longest period of time*			
<10,001	294 (51.2)	296 (57.0)	590 (54)
10,001–50,000	90 (15.7)	97 (18.7)	187 (17.1)

Table 1 continued

	Women (<i>n</i> = 574) <i>n</i> (%) ^a	Men (<i>n</i> = 519) <i>n</i> (%) ^a	Total (<i>n</i> = 1093) <i>n</i> (%) ^a
50,001–100,000	49 (8.5)	40 (7.7)	89 (8.1)
100,001–500,000	63 (11.0)	48 (9.2)	111 (10.2)
>500,000	70 (12.2)	37 (7.1)	107 (9.8)

^a Percentages do not always add up to 100 due to rounding up and/or missing cases

Gender differences: **p* < .05; ***p* < .01; ****p* < .001

Table 2 Proportions (%) of participants reporting specific sexual behaviors and experiences by gender^a

	Women <i>n</i> (%)	Men <i>n</i> (%)	Total <i>n</i> (%)
Sexual intercourse*			
Yes	475 (83.8)	452 (87.1)	927 (84.4)
Age at first intercourse***			
14 and younger	11 (2.5)	26 (5.7)	37 (4.0)
15	25 (5.3)	39 (8.6)	64 (6.9)
16	89 (18.7)	91 (20.1)	180 (19.4)
17	121 (25.5)	113 (25.0)	234 (25.2)
18	78 (16.4)	100 (22.1)	178 (19.2)
19	68 (14.3)	33 (7.3)	101 (10.9)
20 and older	68 (14.3)	31 (6.7)	99 (10.8)
“Do you feel that you have started having sex too early?”***			
Yes	83 (17.5)	25 (5.5)	108 (11.7)
No	300 (63.2)	372 (82.3)	672 (72.5)
Don't know	81 (17.1)	45 (10.0)	126 (13.6)
Contraception at first intercourse			
None	98 (20.7)	85 (21.3)	193 (21.0)
Withdrawal*	71 (15.1)	52 (11.6)	123 (13.4)
Condom	274 (57.9)	277 (62.0)	551 (59.9)
The pill	12 (2.5)	9 (2.0)	21 (2.3)
Natural methods	2 (.4)	3 (.6)	5 (.5)
Other	1 (.2)	1 (.2)	3 (.2)
Contraception at last intercourse			
None	107 (22.7)	96 (21.4)	203 (22.1)
Withdrawal**	71 (15.0)	42 (9.4)	113 (12.3)
Condom***	205 (43.3)	270 (60.3)	475 (51.6)
The pill***	71 (15.0)	26 (5.8)	97 (10.5)
Natural methods*	11 (2.3)	5 (1.2)	16 (1.7)
Other	2 (.4)	0	2 (.2)
Frequency of condom use in the last 12 months*			
Never	90 (21.2)	54 (13.4)	144 (17.4)
Rarely	88 (20.8)	90 (22.3)	178 (21.5)
Sometimes	75 (17.7)	58 (14.4)	133 (16.1)
Often	86 (20.3)	104 (25.7)	190 (22.9)
Always	85 (20.0)	98 (24.3)	183 (22.1)

Table 2 continued

	Women <i>n</i> (%)	Men <i>n</i> (%)	Total <i>n</i> (%)
Ever received oral sex			
Yes	393 (68.5)	347 (66.9)	740 (67.7)
Ever gave oral sex			
Yes	371 (64.6)	359 (69.2)	730 (66.8)
Ever had anal sex***			
Yes	102 (17.8)	145 (27.9)	247 (22.6)
Number of sexual partners (ever)***			
1	150 (31.6)	56 (12.4)	206 (22.2)
2	90 (18.9)	53 (11.7)	143 (15.4)
3	57 (12.0)	66 (14.6)	123 (13.3)
4–6	93 (19.6)	120 (26.6)	213 (23.0)
7–10	41 (8.6)	59 (12.9)	100 (10.8)
>10	15 (3.0)	50 (10.9)	65 (6.9)
Number of oral sex only partners (ever)***			
0	268 (56.4)	206 (45.6)	474 (51.1)
1	107 (22.5)	91 (20.1)	198 (21.4)
2	39 (8.2)	39 (8.6)	78 (8.4)
3	15 (3.2)	23 (5.1)	38 (4.1)
4 and more	18 (3.7)	56 (12.2)	74 (7.9)
Number of sexual partners in the last 12 months***			
0	42 (8.8)	40 (8.8)	82 (8.8)
1	309 (65.1)	207 (45.8)	516 (55.7)
2	59 (12.4)	86 (19.0)	145 (15.6)
3	30 (6.3)	48 (10.6)	78 (8.4)
4 and more	16 (3.3)	52 (11.5)	68 (7.3)
Sex with someone 10 or more years older in the last 12 months**			
Yes	55 (11.6)	27 (6.0)	82 (8.8)
Had concurrent relationships***			
Yes	79 (16.6)	138 (30.5)	217 (23.4)
One night stands in the last 12 months***			
Yes	103 (21.7)	173 (38.3)	276 (29.8)
Used alcohol before sex***			
Never	204 (42.9)	94 (20.8)	298 (32.1)
Sometimes	222 (46.7)	263 (58.2)	485 (52.3)
Often	32 (6.8)	77 (17.1)	109 (11.8)

Table 2 continued

	Women <i>n</i> (%)	Men <i>n</i> (%)	Total <i>n</i> (%)
Used illicit drugs before sex**			
Never	393 (82.7)	332 (73.5)	725 (78.2)
Sometimes	54 (11.4)	85 (18.8)	139 (15.0)
Often	7 (1.5)	17 (3.7)	41 (2.6)
Ever paid for sex***			
Yes	0	24 (5.3)	24 (2.6)
Ever been paid for sex			
Yes	4 (0.8)	7 (1.5)	11 (1.2)
Use of pornography in the last 12 months***			
Never	272 (57.3)	61 (13.5)	333 (35.9)
Rarely	126 (26.5)	149 (33.0)	275 (29.7)
Sometimes	41 (8.6)	136 (30.1)	177 (19.1)
Often	16 (3.4)	89 (19.7)	105 (11.3)
Sexual partners' sex			
Exclusively opposite	422 (88.8)	414 (91.6)	836 (90.2)
Mostly opposite	29 (6.1)	17 (3.8)	46 (5.0)
Equally opposite and same-sex	5 (1.1)	2 (.4)	7 (.8)
Mostly same-sex	1 (.2)	2 (.4)	3 (.3)
Exclusively same-sex	1 (.2)	1 (.2)	2 (.2)
Converse with partner about sex***			
Never	19 (4.0)	25 (5.5)	44 (4.7)
Rarely	50 (10.5)	81 (17.9)	131 (14.1)
Sometimes	152 (32.0)	175 (38.7)	327 (35.3)
Often	251 (52.8)	166 (36.7)	417 (45.0)
Ever diagnosed with STI***			
Yes	64 (13.4)	14 (3.2)	78 (8.5)
Ever tested for HIV			
Yes	20 (4.2)	30 (6.6)	50 (5.4)
Change in sexual behavior in the last 12 months due to HIV risks*			
Yes	95 (20.0)	118 (26.1)	213 (23.0)
Experienced sexual victimization***			
Yes	15 (3.2)	2 (.4)	17 (1.8)
No	425 (89.5)	430 (95.1)	855 (92.2)
Don't know if you can call it that	16 (3.4)	0	16 (1.7)
Don't want to answer	7 (1.5)	4 (.9)	11 (1.2)

^a Percentages do not always add up to 100 due to missing cases

Gender differences: * $p < .05$; ** $p < .01$; *** $p < .001$

HIV/AIDS Transmission and Prevention Scale

This consisted of 7 “true/false/don’t know” format items concerning modes of HIV/AIDS transmission (e.g., “Can HIV/AIDS be transmitted by sharing food with someone infected?”) and prevention (e.g., “Is it possible to protect oneself from HIV/AIDS infection by having sex exclusively with one, healthy and faithful, partner?”). All correct

answers were scored as 1. False and “don’t know” answers were coded as 0. The mean score was 5.38 ($SD = 1.63$; range 0–7). Cronbach’s α for the scale was .63.

Parental Monitoring Scale

The scale-assessed parent’s knowledge of what participants did outside of home (e.g., “Do your parents know your friends?”) and utilized four 3-point items (1 = parents don’t know, 2 = know a little bit, 3 = mostly know). The scale ranged from 4–12, with larger numbers indicating more control. The mean score was 10.24 ($SD = 1.88$) and Cronbach’s α was .84.

Religious Upbringing and Religiosity

To assess whether participants had a *religious upbringing*, we used the following question: “At home, were you raised in a religious spirit?” Response options were “not at all,” “yes, but not strictly,” and “yes, strictly.” The variable was dichotomized into 1 = strict religious upbringing and 0 = no religious upbringing or not strict religious upbringing. The measure of participants’ *religiosity* was constructed by collapsing two moderately strongly correlated variables ($r = .62, p < .001$)—one asking about the acceptance of religious teachings and the other about the frequency of church going—into a single indicator. The variables were first transformed into z scores.

Peer Sexual Attitudes Scale

The scale consisted of six yes/no items asking about friends’ opinions with regard to sex (e.g., “Most of my friends think that having a lot of sexual experience is cool”). Absolute range was 0–6, with larger numbers denoting more peer support of potentially risky sexual behaviors. The mean score was 4.52 ($SD = .83$) and the reliability coefficient was .60.

Peer influence was additionally measured with two other variables. The first asked about how important one’s friends were as a source of information; this was part of a multi-item list of potential sources of information (ranging from “parents” to “pornography”). Responses were made on a 4-point scale (1 = not at all to 4 = very important). The indicator was dichotomized into 0 = no to moderate importance and 1 = strong importance. The second indicator asked if first sex happened because of peer pressure: “Friends talked me into having sex for the first time” (4-point scale from 1 = of no importance to 4 = of decisive importance). Again, this was one item from a list of possible reasons for sexual initiation, ranging from “being in love” to “being forced to have sex.” This indicator was

dichotomized into 0 = of no or little importance and 1 = of significant to decisive importance.

Conversation about Sex with Parents when of Primary School Age

Conversation about sex with parents was assessed by collapsing two 4-point variables (1 = never, 4 = often), “During your primary school, how often did you talk about the subject of sex with your mother/father?” ($r = .40$).

Conversation about Sex with One’s Partner

This was a single item indicator that used a 4-point scale (1 = never to 4 = often). The question was: “How often do you discuss your sex life with your partner? If currently single, think about your last relationship.” Because of its skewed distribution, the variable was dichotomized so that 1 represented “often” and 0 all other response options.

Condom Use Self-efficacy Scale

The scale utilized four 5-point Likert type items adapted from Brafford and Beck (1991), such as “I feel confident in my ability to use a condom correctly,” and ranged 4–20 (mean 15.22, $SD = 3$). Higher scores indicated greater self-efficacy. The scale had acceptable reliability (Cronbach’s $\alpha = .69$).

Beliefs about Condoms and Condom Use

Two scales were used. The first, *Positive Beliefs about Condoms Scale*, used three 5-point items (1 = disagree completely, 5 = completely agree) that expressed confidence in the effectiveness of condoms and the belief that individuals who used condoms were responsible (e.g., “Condoms offer good protection against pregnancy,” “People who use condoms are very responsible”). The other scale, *Myths about Condom Use*, consisted of four 5-point Likert type items that assessed acceptance of negative stereotypes (e.g., “Those who suggest condom use do not trust their partners,” “It is promiscuous people who suggest using a condom”). Both scales had acceptable α values, .66 and .75, respectively. The range was 3–15, with a mean of 12.15 ($SD = 2.26$) for the first, and a mean of 8.60 ($SD = 3.46$; range 4–20) for the second scale. The two scales were weakly correlated ($r = -.20$; $p < .01$).

Sexual Assertiveness Scale

The scale was composed of three true/false items (e.g., “If I don’t feel like having sex, I will surely tell this to my

partner”) with a Cronbach’s α of .52. The scale ranged from 3–6, with a mean score of 5.54 ($SD = 0.76$). Higher scores indicated more sexually assertive behavior.

Religiously Based Traditionalism Scale

The scale was used to assess participants’ acceptance of traditional views about human sexuality. This composite indicator consisted of six 5-point Likert-type items (e.g. “Abortion can never be justified,” “In the matters of sexuality, my religion is my guide”), with higher scores indicating greater acceptance of a restricted sexual morality. Range was 6–30 and the mean score 11.46 ($SD = 4.1$); Cronbach’s α was .66.

Acceptance of the Double Standard Scale

The scale was constructed to measure participants’ views on gender sexual equality. It utilized six 5-point Likert type items, such as “Women should be less sexually experienced than men” and “A man should be the one who initiates sex.” Absolute range for the scale was 6–30 and the mean score was 13.04 ($SD = 5.88$). Higher scores denoted greater acceptance of gender sexual inequality. The scale had good internal consistency ($\alpha = .86$). As expected, the correlation between the acceptance of the double standard and the religious traditionalism scale was positive and significant ($r = .21$, $p < .001$).

Locus of Control

To measure an individual’s sense of his/her life being under internal (personal actions) vs. external control (destiny, actions of others etc.) we used four 5-point Likert type items, such as: “Whatever I do, I cannot change my destiny” or “My life is nothing but the result of my actions.” Cronbach’s α for the scale was .60. The range was 6–30 ($M = 9.59$, $SD = 3.19$), with higher scores indicating more external sense of control.

Sensation Seeking Scale (SSS)

A shortened version of the SSS, focusing on the need for new and varied experiences through disinhibited, and often risky, behavior, was derived from Zuckerman’s (1994) Sensation Seeking Scale. In order to keep the questionnaire size reasonable, we used only seven 5-point items (two related to boredom, three to taking risks, and two to disinhibition), which all loaded on the same factor ($>.45$). The shortened SSS ranged from 7–35 ($M = 22.55$, $SD = 6.12$), with larger scores indicating greater sensation seeking. Cronbach’s α for the scale was .78.

Rosenberg Self-esteem Scale

The scale comprised 10 5-point Likert type items and was used to assess participants' self-image (Rosenberg, 1965). In our sample, the reliability coefficient was .79 ($M = 40.39$, $SD = 5.84$, range 10–50); larger scores reflected higher self-esteem.

Sexual Victimization

Experience of sexual victimization was assessed with a single question: "Have you ever been forced to do something sexually by threats, blackmail or force?" Response options were "no," "yes," "not sure if I can call it that," and "don't want to answer." The variable was dichotomized into negative response (coded 0) and all other responses (coded 1). The two groups differed significantly on the Rosenberg Self-Esteem Scale ($t = 3.40$, $df = 815$, $p < .001$), the abused group having lower mean scores.

Personal Risk Assessment

We used two 10-point items: "In your opinion, what are the odds of you getting infected with HIV/AIDS?" and "In your opinion, what are the odds of you getting infected with some other sexually transmitted disease?" to measure personal risk assessment. Response options ranged from 1 (the odds are infinitely small) to 10 (the odds are very high). The two items, moderately strongly correlated ($r = .77$, $p < .001$), were collapsed into a new variable.

Behavioral Intent

Behavioral intent was represented by two 5-point items ("How likely is it that you will use a condom next time you have sex with your steady partner?" and "How likely it is that you will use a condom next time you have sex with a casual partner?"). The items, which were moderately correlated ($r = .46$, $p < .01$), were combined into a single-item indicator.

Index of Sexual Risk Taking (ISRT)

Following the recent practice of using composite measures of sexual risk taking (Beadnell et al., 2005; Metzler, Noell, Biglan, Ary, & Smolkowski, 1994; Robinson et al., 2005), which rests upon evidence-based assumptions that this approach yields more reliable and valid estimates than single-item indicators, our main dependent variable, ISRT (Štulhofer, Jureša, & Mamula, 2001), was constructed using ten dichotomized (yes/no) items. Based on our starting definition of sexual risk taking—viewed as a set of sexual and non-sexual behaviors that have been empirically

linked to an increased risk of negative reproductive and sexual health outcomes—index items were selected based on previous research (Beadnell et al., 2005; Brook et al., 2004; La Bric, Earleywine, Schiffman, Pedersen, & Marriot, 2005; Staton et al., 1999; Valois, Kammermann, & Drane, 1999; Weinhardt, & Carey, 2000). The ISRT included the following behaviors: (1) ever had anal sex (1 = yes); (2) experience of "one night stands" in the last 12 months (1 = yes); (3) condom not used at last sex (1 = yes); (4) had sex with a partner who was 10 or more years older in the last 12 months (1 = yes); (5) experience of concurrent sexual relationships (1 = yes); (6) number of sexual partners (1 = if larger than median); (7) inconsistent condom use in the last 12 months (1 = condom used never to sometimes); (8) alcohol used before sex (1 = sometimes to often); (9) illicit drugs used before sex (1 = sometimes to often); (10) early sexual initiation (1 = if less than 16).

The ISRT scale had a 0–10 range ($M = 3.45$, $SD = 2.13$), with higher scores reflecting more sexual risks. Cronbach's α for the ISRT was .64. To assess discriminant validity of the ISRT, we carried out two t -tests to ascertain whether the ISRT discriminated between participants who had been diagnosed with STI and those who had not, as well as between those with and without a history of symptoms consistent with those caused by STI (urethral/vaginal discharge). In both cases, significant differences were found ($t = -3.41$, $df = 69.55$, $p < .001$ and $t = -2.20$, $df = 771$, $p < .05$, respectively) and in the expected direction: participants with past STI diagnoses or symptoms scored higher on ISRT.

Results

Descriptive Findings

Table 1 contains data on various sociodemographic characteristics of the sample. One of the most obvious culture-specific findings was the fact that the majority of participants were still living with their parents, although more than 50% of them were no longer students.¹ Religiosity levels confirmed the rather secular character of religion among young people in Croatia. Most participants attended religious services only a few times a year; young women were more likely to attend church at approximately

¹ This reflects the acute housing problem in Croatia, caused by both the shortage of available flats and their high market price. Most young people in Croatia remain living with their parents until they get married, at which time both their families may pool their resources and buy a flat for the newlyweds. The gender difference in percentage of participants living with their parents should be attributed to the finding that young women were more likely to be married at interview.

Table 3 Gender differences in composite indicators^a

	Women			Men			<i>t</i>	<i>df</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>			
HIV/AIDS knowledge	5.51	1.57	405	5.26	1.67	442	-2.25	845*	.15
Parental monitoring	10.72	1.62	312	9.79	1.98	374	-6.83	683.69***	.51
Conversation about sex with parents	3.36	1.33	405	3.30	1.31	447	-.61	850	.05
Peer sexual attitudes	4.14	.77	409	4.85	.73	450	14.07	857***	-.95
Religiosity	.21	1.78	410	-.19	1.91	450	-3.14	857.85**	.22
Religiously based traditionalism	11.36	4.07	407	11.54	4.14	445	.64	850	-.04
Acceptance of the double standard	11.25	5.06	409	14.68	6.10	447	8.98	845.27***	-.61
Sensation seeking	21.16	6.11	409	23.82	5.86	447	6.50	854***	-.44
Self-esteem	40.15	5.72	405	40.19	5.69	446	1.77	849	-.01
Locus of control	9.46	2.99	410	9.71	3.37	447	1.15	854.38	-.08
Sexual assertiveness	5.75	.59	382	5.37	.82	422	-7.65	761.93***	.53
Positive beliefs about condoms	12.11	2.31	405	12.28	2.22	449	1.13	852	-.08
Myths about condom use	6.01	2.36	406	6.70	2.78	450	3.79	853.53***	-.27
Condom use self-efficacy	15.07	3.03	405	15.43	2.93	446	1.17	849	-.12
Personal risk assessment	4.87	3.72	401	4.80	3.38	441	-.29	840	.02
Behavioral intent	3.64	1.15	120	3.70	1.04	262	.52	380	-.05
Sexual risk-taking (ISRT)	3.14	2.06	374	3.73	2.16	403	3.91	775***	-.28

^a Participants sexually active in the last 12 months; numbers vary due to missing cases or filtered-out categories (behavioral intent)

* $p < .05$; ** $p < .01$; *** $p < .001$

monthly intervals. We found no significant gender difference in the intensity of religious upbringing, with only a minority of participants (9.4%) reporting a “strict” religious background.

Gender differences were found in family socioeconomic status (SES) and participants' occupation. Compared with men, young women were less likely to report that their family was of above-average SES and were less likely to be employed. A sizeable proportion (20%) of participants reported having grown up in large cities (100,000 or more inhabitants), with young women overrepresented in this group.

Table 2 presents data on sexual activities and sexuality-related experiences. Most of the participants had already had sexual intercourse (84.4% of the overall sample); more young women than men reported no experience of sexual intercourse. Median age at first intercourse was 17 for both men and women, with an average age of 17.02 ($SD = 1.70$) for young men and 17.61 ($SD = 1.74$) for young women. Significantly more young women than men reported that they started having sex “too early,” but the overall majority of participants (72.5%) did not share this feeling.

Overall, a fifth of participants reported consistent condom use in the last 12 months. Most participants, though, did not use condoms when having oral sex; 74% of those who reported the activity in the last 12 months never used condoms when having oral sex (data not shown). A sizeable

proportion of participants (22.6%) reported having had anal sex, with men more likely than women to report this.

As in most previous studies, men reported more sexual partners, both in the last 12 months and in their lifetime, than women, as well as more partners with whom only oral sex was practiced. On average, men reported 5.7 lifetime sexual partners ($SD = 5.77$) and women 3.5 ($SD = 3.49$). Men were also more likely than women to have had casual sexual affairs in the last 12 months, as well as concurrent sexual relationships.

In comparison to men, women reported significantly greater frequency of discussing sexual issues with the partner. Gender differences were also evident in reports of the use of sexually explicit materials in the last 12 months, alcohol or illicit drug use before sex, the likelihood of being diagnosed with a STI, the likelihood of behavioral change in the last 12 months due to HIV risk,² and sexual victimization. As expected, young women were more likely to report being “ever” diagnosed with a STI and the experience of being sexually victimized. Of the 475 young women who had experienced sexual intercourse, 52 (11%) reported getting pregnant at least once.

² Of the 23% of men and women who claimed to have changed their behavior in the last 12 months, most reported more frequent condom use followed by having sex with only one, steady partner.

Gender differences in composite indicators are presented in Table 3. Among young women and men who were sexually active in the preceding year, there were significant differences on nine out of 17 variables. In comparison to men, women reported better HIV/AIDS knowledge ($p < .05$), stronger parental monitoring ($p < .001$), and peer attitudes that were less supportive of sexual risk-taking ($p < .001$). Women were also more religious ($p < .01$) and had lower average scores on sensation seeking ($p < .001$)

and sexual risk-taking (ISRT; $p < .001$) scales, but at the same time were more sexually assertive ($p < .001$) and less accepting of the double standard ($p < .001$) and myths about condom use ($p < .001$).

As expected, men were found to have significantly higher scores on the sexual risk-taking scale (ISRT) than women ($p < .001$; see Table 3); the longer a participant's sexual career, i.e., number of years of sexual activity, the higher the ISRT score ($r_S = .45$, $p < .001$).

Table 4 Hierarchical regression analysis predicting sexual risk-taking behaviors in women sexually active in the past 12 months

	A (β/t)	B (β/t)	C (β/t)	D (β/t)
Community level				
Urban vs. rural place of growing up	.11/2.18	.07/1.37	.06/1.27	.05/1.06
Had sex education in school	.05/.99	.06/1.27	.04/.93	.04/.99
Family level				
Living with both parents at 18		-.04/-.81	-.03/-.64	.00/.00
Parental monitoring		-.15/-3.05**	-.12/-2.48*	-.08/-1.59
Family SES		.04/.86	.05/.90	.05/1.09
Father's education		-.02/-.25	.02/.36	.03/.46
Mother's education		.07/1.19	.05/.89	.02/.46
Conversation about sex with parents		.02/.35	.02/.42	.01/.28
Strict religious upbringing		-.08/-1.47	-.05/-1.07	.01/.12
Peer group level				
Peer sexual attitudes			.09/1.83	.03/.74
Friends as important source of information about sex			.11/2.36*	.07/1.59
Sexual initiation due to peer pressure			.20/4.19***	.14/2.92**
Individual level				
Religiosity				-.08/-1.50
Religiously based traditionalism				-.09/-1.66
Acceptance of the double standard				.07/1.19
Sensation seeking				.17/3.48**
Self-esteem				.04/.74
Locus of control				-.03/-.55
Sexual assertiveness				-.13/-2.57*
Positive beliefs about condoms				-.07/-1.50
Myths about condom use				.00/.07
Condom use self-efficacy				.14/2.58*
HIV/AIDS knowledge				-.04/-.89
Personal risk assessment				.11/2.37*
Behavioral intent				-.14/-3.15**
Conversation about sex with partner				-.05/-.96
Used condom at first sex				-.20/-4.49***
Sexual victimization experience				.13/2.81**
R^2 change/F change	.01/2.87	.04/2.14*	.07/10.21***	.20/7.00***
Adj R^2	.01	.03	.09	.27

A = community effect model; B = community + family effect model; C = community + family + peer group effect model; D = community + family + peer group + individual level effect model

* $p < .05$; ** $p < .01$; *** $p < .001$

Predictors and Correlates of Risky Sexual Behavior

To assess relative effects of community, family, and peer environment (vulnerability dimension) vs. individual level factors, such as religiosity, sensation seeking or HIV knowledge (risk-taking dimension), we carried out hierarchical regression analysis with the ISRT score as the dependent variable. The regression model was built by entering four blocks of independent variables: community level variables; family level variables; peer levels effects; and individual level effects. The analyses were done in a

sequential manner, i.e., adding the next block at each step so that the last model tested all four blocks together. Analyses were run separately by gender. The results are summarized in Tables 4 and 5.

The findings indicated that most of the significant predictors of HIV-related sexual risk-taking were not gender specific. Of the eight significant predictors in the final female regression model, only two were gender specific. Similarly, of the ten predictors in the male model, four were gender specific. The contribution of community, family, and peer environment was of marginal importance,

Table 5 Hierarchical regression analysis predicting sexual risk-taking behaviors in men sexually active in the past 12 months

	A (β /t)	B (β /t)	C (β /t)	D (β /t)
Community level				
Urban vs. rural place of growing up	-.08/-1.73	-.09/-1.87	-.10/-2.18*	-.06/-1.52
Had sex education in school	.02/.52	.04/.81	.03/.73	.05/1.09
Family level				
Living with both parents at 18		-.10/-2.04*	-.09 /-1.94	-.03/-.60
Parental monitoring		-.21/-4.54***	-.18/-3.85***	-.11/-2.56*
Family SES		-.00/-.01	.02/.38	.06/1.38
Father's education		.01/.15	.02/.36	-.05/-.97
Mother's education		.04/.66	.01/.26	.01/.13
Conversation about sex with parents		.04/.80	.04/.92	-.01/-.13
Strict religious upbringing		-.05/-.99	-.03/-.72	-.02/-.55
Peer group level				
Peer sexual attitudes			.17/3.70***	.05/1.16
Friends as important source of information about sex			.03/.69	-.01/-.26
Sexual initiation due to peer pressure			.10/2.51*	.08/2.02*
Individual level				
Religiosity				-.08/-1.71
Religiously based traditionalism				-.10/-1.97*
Acceptance of the double standard				.02/.37
Sensation seeking				.12/2.81**
Self-esteem				.04/.93
Locus of control				.06/1.28
Sexual assertiveness				-.05/-1.15
Positive beliefs about condoms				-.07/-1.40
Myths about condom use				-.03/-.59
Condom use self-efficacy				.06/1.08
HIV/AIDS knowledge				-.10/-2.47*
Personal risk assessment				.15/3.41**
Behavioral intent				-.23/-5.40***
Conversation about sex with partner				.11/2.45*
Used condom at first sex				-.23/-5.39***
Sexual victimization experience				.13/2.95**
R^2 change/F change	.01/1.59	.06/3.80**	.04/6.64***	.26/10.64***
Adj R^2	.00	.04	.08	.32

A = community effect model; B = community + family effect model; C = community + family + peer group effect model; D = community + family + peer group + individual level effect model

* $p < .05$; ** $p < .01$; *** $p < .001$

suggesting that the concept of vulnerability is either of empirically limited importance in the context of population-based samples or was not adequately assessed in our study. Both issues will be later discussed in more detail.

In the final model, significant family level effects were observed only in the case of men. Lower parental monitoring was linked to more sexual risk-taking ($\beta = -.11$). A similar association was also found in women, but the beta weight became non-significant after the individual level effects block was entered. In contrast, a peer level effect was found in both subsamples. Men and women who reported peer pressure as the main reason for having their first sexual intercourse were also more likely to have a higher score on the ISRT ($\beta_{\text{female}} = .14$, $\beta_{\text{male}} = .08$).

Apart from parental monitoring and peer pressure effects, all other significant predictors/correlates were individual level variables. In women, sexual assertiveness ($\beta = -.13$) and condom use self-efficacy ($\beta = .14$) were significantly associated with ISRT. Interestingly, women who evaluated their condom efficacy as high were more likely to report sexual risk-taking behaviors. In men, four correlates were gender-specific: aforementioned parental monitoring, religiously based traditionalism ($\beta = -.10$), HIV knowledge ($\beta = -.10$), and conversing with one's partner about sex ($\beta = .11$).

Regarding individual level predictors/correlates, five indicators were significant in both male and female subsamples. Specifically, men and women who had higher Sensation Seeking scores ($\beta_{\text{male}} = .12$; $\beta_{\text{female}} = .17$), did not use condoms at first sex ($\beta_{\text{male}} = -.23$; $\beta_{\text{female}} = -.20$), judged their personal risk of getting infected with HIV or other STI higher than others ($\beta_{\text{male}} = .15$; $\beta_{\text{female}} = .11$), reported being unlikely to use condoms at next sexual intercourse ($\beta_{\text{male}} = -.23$; $\beta_{\text{female}} = -.14$), and had been sexually victimized ($\beta_{\text{male}} = .13$; $\beta_{\text{female}} = .13$) scored significantly higher on the ISRT.

As seen in Tables 4 and 5, the first three steps—introducing community, family and peer level effects—accounted for marginal percentages of variance in female and male sexual risk-taking. Moreover, most of the significant family and peer level effects lost significance after individual level effects were entered, as one would expect for indirect effects. Before the last step, stepwise increases in R^2 were almost linear in the male model, but not in the female model. Once the individual level effects block was entered, the final model was able to explain 27% of the variance in female, and 32% of the variance in male, sexual risk-taking.

Discussion

In comparison to older people, adolescents and young adults are more vulnerable to HIV/STI risks since they are

less likely to be married and more likely to have multiple sexual partners (Bajos, Guillaume, & Kontula, 2003; Cooper et al., 1998). Despite high levels of awareness regarding transmission of HIV/STI infections, many young women and men engage in sexual practices that put them at risk for health-adverse outcomes. The aim of this article, based on the first nationally representative dataset of young Croatian adults aged 18 to 24, was to assess the extent and characteristics of HIV/STI sexual risk-taking in this target group, as well as to address the relative importance of vulnerability factors and proneness to sexual risk-taking. Given gender-specific sexual socialization and the waning but nevertheless persistent societal acceptance of the double standard (Hatherall, Stone, Ingham, & McEachran, 2005; Holland, Ramazanoglu, Sharpe, & Thomson, 2000; Hyde & Jaffee, 2000), we analyzed gender-specific patterns of sexual risk-taking.

Patterns of Sexual Behavior and Sexual Risk-taking

With respect to the basic patterns of sexual behavior in Croatian young women and men, our findings pointed to several culture-specific characteristics, particularly those related to first sexual experiences. Gendered age patterns of sexual initiation among Croatian youth, with young men having first sexual intercourse at a slightly younger age, was consistent with Bajos et al.'s (2003) conclusion that “earlier sexual initiation among males compared to females has been observed throughout all the Eastern European countries” (p. 66; see also European Commission, 2000). It should be pointed out that although Croatian findings on gendered age pattern of sexual debut are similar to the Czech and Ukrainian data (Bajos et al., 2003) the gender gap in our sample was very narrow, on average only about 7 months. As was recently documented, the gap has markedly narrowed in the last three decades, suggesting a weakening of the double standard combined with increasing sexual permissiveness (Štulhofer, Dokmanović, Ajduković, Božičević, & Kufrin, 2006).

At initial sexual experiences, Croatian youth seem to be less protected than their U.K. peers. Among the latter, 75.6% of young women and 76.6% of young men in the 20–24 age group reported that condoms were used at first intercourse (Wellings et al., 2001). In the current Croatian sample, only 57.9% of young women and 62% of young men reported the same protective behavior. Similarly, only 12.1% of young women and 10% of young men in the U.K. reported not using any contraceptive method at first intercourse, in comparison to 20.7% and 21.3% in the Croatian sample, respectively. Unfortunately, due to poor STI surveillance in Croatia, we were unable to examine whether the observed difference in condom use could be associated with differential rates of increase in the

prevalence of chlamydia among young people in Croatia and the U.K. As recently documented, chlamydial infections are on the rise in the U.K. (Brown et al., 2004).

A similarly discouraging picture emerges from a comparison of protective sexual behaviors during last intercourse. Consistent with findings from the most recent national U.K. study (Wellings et al., 2001), the percentage that reported condom use at last intercourse (52%) was lower than the percentage at first intercourse (60%). This most likely reflects the consolidation of sexual relationships that usually leads to replacing condoms with another contraceptive method, such as the birth control pill (Macaluso, Demand, Artz, & Hook, 2000). In comparison to a recent U.S. survey of high-school students (Santelli, Morrow, Andersen, & Lindberg, 2006), prevalence of condom use at last intercourse was somewhat lower among Croatian youth than among American teenagers (58%), despite the fact that this U.S. sample was younger than our sample. Although withdrawal rates (12.3%) were comparable to the U.S. sample (11%), the percentage of participants who used no method of contraception was almost double in the Croatian sample (22% vs. 12%). Also, the use of hormonal contraception was less frequent among Croatian youth (10.5%) than among young Americans (20%), reflecting a popular belief among young Croatian women that the pill is an unhealthy contraceptive choice.

If there is an encouraging finding regarding contraceptive use among Croatian youth, it is that condom use has increased. This is in line with what seems to be a global pattern (Cates, 2001; Santelli, Lindberg, Abma, McNeely, & Resnick, 2000; Santelli et al., 2006; Wellings et al., 2001). While in 1989 only 5% of Croatian women and men in the 16–30 age group reported that they or their partners always used condoms (Ajduković et al., 1991), in 2005 we found 22% of participants reporting consistent condom use. The reasons behind this increase are probably diverse and should be explored in more detail. Some studies suggest that part of the answer may be a lessening of gender sexual inequality and a rising empowerment of young women, as well as a de-stigmatization of condom use generally associated with a global trend of sexual permissiveness (Halman, 1995; Hatherall et al., 2005).

Concerning the extent of HIV/STI risk-taking, the evidence suggests considerable prevalence of potentially risky sexual behaviors. Over one fifth of participants, almost all of them reporting exclusively opposite sex partners, had anal sex, but only one out of every five participants who reported this experience always used condoms during the preceding year. A sizeable proportion of sexually active youth had multiple partners and almost one quarter of participants claimed to have had at least one concurrent sexual relationship. As stated above, most young people in our sample used condoms only sporadically. In sum, these

findings indicate a substantial potential for HIV/STI transmission.

Predictors of Sexual Risk-taking

The regression analyses identified a number of significant correlates/predictors of sexual risk behaviors for both women and men. Of the peer group indicators, only the most direct one—whether a participant was peer pressured into his/her first sexual intercourse—proved significant. The finding suggests that sexual initiation motivated by the wrong reasons can have sustained adverse effects. It is possible that this finding reflects individual differences in conformity to peer norms, which facilitates risk-taking behaviors as long as they are approved by the referent group. Another, closely related possibility is that being peer-pressured into having first sex is a consequence of poor decision-making skills, which would also make sexual risk-taking in the future more likely.

The findings concerning sensation seeking, personal risk assessment, and behavioral intention were consistent with previous evidence. Sensation seeking has been repeatedly associated with a number of risky behaviors, including sexual risk-taking (Bancroft et al., 2004; Brady & Donenberg, 2006; Hoyle, Fejfar, & Miller, 2000). Similarly, risk self-assessment and condom use intention are well-documented predictors of sexual risk-taking in several HIV risk reduction models, such as the Health Belief, Information-Motivation-Behavioral Skills and Planned Behavior models (Albarracin, Fishbein, Johnson, & Muellerleile, 2001; DiClemente & Peterson, 1994; Fisher et al., 1999). The positive association between condom use at first sex and a subsequent lower likelihood of sexual risk-taking had also been previously observed (Sheeran, Abraham, & Orbell, 1999), including in a sample of Croatian high-school students (Hiršl-Hećej & Štulhofer, 2001). The mechanisms underlying this effect have received little attention.

Consistent with other reports (Hamburger et al., 2004; Miller, 1999; Saewyc, Magee, & Pettingell, 2004), sexual victimization was a significant correlate of sexual risk-taking in both young women and men. The fact that the abusive episode preceded a participant's first sexual intercourse in only one third of the cases suggests that there is a bi-directional influence, rather than a simple causal relationship. Early sexual abuse can have long-term consequences, such as persistent mood problems, lowered self-esteem, and problematic sexual adjustment, which could also result in increased sexual risk-taking (Browning & Laumann, 1997; Miller, 1999). Alternatively, sexual risk-taking could increase the risk of sexual victimization, particularly through having sex with multiple sexual partners.

In contrast with some other investigators, we did not find significant effects of religiosity (Meier, 2003; Rostovsky, Regnerus, Wright, & Laurie, 2003), beliefs and attitudes about condoms and condom use (Sheeran et al., 1999), or self esteem (Sterk, Klein, & Elifson, 2004). A possible reason for the lack of association between sexual risk-taking and religion is the fact that, for most young people in Croatia, religion is an identity label, often merged with an ethno-national one, so religious values are rarely considered as guidelines for everyday conduct. The lack of association between self-esteem and sexual risk-taking might be due to self-esteem having only weak or indirect effects on sexual risk-taking, as indeed suggested by recent studies (Abel & Chambers, 2004; Boden & Horwood, 2006). Unable to distinguish between indirect and direct effects, regression analysis cannot detect such an influence.

Although we postulated the importance of *exogenous* factors and have, accordingly, built a hierarchical regression model, we found little or no effect of community, family, and peer group factors. This is in contrast to findings from a number of studies (Blum & Mmari, 2004; Hatherall et al., 2005; Kerrigan, Witt, Glass, Chung, & Ellen, 2006; Rani & Lule, 2004; Sieving, Eisenberg, Pettengell, & Skay, 2006). Our aim was to distinguish between socially induced vulnerability (determined by community norms, and family and peer socialization) and the propensity for sexual risk behavior (determined by *endogenous* factors such as personal values and beliefs, as well as experiences). Clearly, the two dimensions are interdependent and co-evolve in a developmental sequence that begins with family socialization and community influences. If this is the case, cross-sectional studies would be characterized by a low sensitivity to the more distal (exogenous) influences simply because their effect has been absorbed by more proximal (endogenous or individual level) factors. Hence, a panel study would be much better suited for analyzing young people's HIV/STI vulnerability.

It should also be noted that the studies reporting significant community and family SES effects were most often carried out in developing countries (Blum & Mmari, 2004), in ethnically or racially heterogeneous communities (Braithwaite & Thomas, 2001; Kerrigan et al., 2006; Robinson et al., 2005), or analyzed only cases at the extreme ends of the socioeconomic scale (Rani & Lule, 2004).

Limitations

The findings were limited by the validity of self-report and by possible recall biases. In particular, recall error might have been a problem with some of the questions related to family and peer level variables, which asked participants to recall events/circumstances going back a number of years.

Further limitations were that some of our variables were assessed using single item indicators, and the fact that our criterion variable, a composite measure of sexual risk-taking (the IRST), still requires validation. Since some of our measures were skewed, non-parametric tests were used wherever feasible to confirm the findings from parametric analyses.

Implications for HIV/STI Prevention Policy

The findings from this study have important implications for education and prevention efforts directed toward young people at risk of STI/HIV. The fact that more than 20% of participants reported not using any form of contraceptive at first intercourse and that non-use of condoms during first intercourse was a good predictor of future sexual risk-taking suggests that it is critical that education efforts be targeted at young adolescents before they become sexually active.

We found that for both young women and men, higher sexual risk-taking was associated with peer pressure having been reported as the primary reason for starting to have sex. Providing peer-led education and opportunities for young people to "role-play" behavioral responses to peer pressure may be one way to address this (Rotheram-Borus, O'Keefe, Kracker, & Foo, 2000).

Although few of our significant predictors of sexual risk-taking were gender-specific, we did find that low sexual assertiveness was associated with increased sexual risk-taking in women. This reinforces the need for education and intervention programs to pay special attention to issues related to negotiation of condom use for women (Wingood & DiClemente, 1996), but also to communication skills in general. A more puzzling finding was that for women only, higher scores on condom self-efficacy were associated with *greater* sexual risk-taking. Although the explanation for this finding is unclear, it is important to bear in mind that although women do apply condoms (Sanders et al., 2006), they are largely a male-controlled method. Relevant to this point is a study which found that a majority of young female participants, although able to initiate discussion of condom use within their relationships, chose not to negotiate condom use since its relationship-related costs were perceived too high (Polacek, Celantano, O'Campo, & Santelli, 1999). In addition, it could be that some young women overestimate their condom use skills (Crosby et al., 2001) or are more likely to harbor the illusion that good skills alone equal protection. We found no correlation between condom use self-confidence and frequency of condom use in women or men.

Turning to gender-specific predictors in men, we found that lower knowledge about HIV transmission and greater

acceptance of myths about condoms and their use predicted higher sexual risk-taking. This suggests that although levels of HIV knowledge may be reasonably high among young people, there is still a need to provide basic information and, perhaps particularly for young men, to dispel certain stereotypes and false beliefs. Clearly, this finding may be culture-specific.

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