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Trends in condom use: Brazil 1998 and 2005

ABSTRACT

OBJECTIVE: To analyze the levels, tendencies and sociodemographic differentials of condom use among the Brazilian urban population.

METHODS: The data analyzed was collected in 1998 and 2005, in the study, "Sexual Behavior and Perceptions of the Brazilian Population concerning HIV/Aids". The probabilistic samples, in multiple stages, included men and women aged 16 to 65 years old, living in urban areas. Interviews with individuals that had been sexually active during the 12 months preceding the interview were included in the analysis. The univariate models were based on chi-square tests, corrected by sample planning, and odds ratio calculations; multivariate analysis involved adjustment of logistic regression models, controlling all other interest variables.

RESULTS: There was a significant increase in the use of condoms in the 12 months preceding the interview and at the last sexual intercourse. Young people from 16 to 24 years of age protected themselves more in sexual intercourse, particularly with eventual partners. Men used condoms more frequently only when they had an eventual partner. The use of condoms was more frequent among single people. There were no regional differences with respect to the consistent use of the condom. In stable relationships Pentecostals reveal the least amount of protection in sexual intercourse. People who have no religious affiliation or adepts of other religions have higher rates of protection. Level of education, an important differential with respect to the use of condoms in 1998, maintained its prominence in 2005.

CONCLUSIONS: The results indicate the need for greater in depth discussion concerning actions that are geared towards increasing the consistent use of condoms, particularly among populations with lower educational levels and those that are more vulnerable, such as young women or women in stable relationships.

DESCRIPTORS: Condoms. Safe Sex. Unsafe Sex. Sexual Behavior. Socioeconomic Factors. Population Studies in Public Health. Brazil. Condoms use. Cross-section studies.

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INTRODUCTION

Concern regarding the need for studies to evaluate the degree of vulnerability of distinct population groups to sexually transmitted diseases has marked the international scenario for the past decades.

Since the mid-1990s the first nationwide studies on sexual behavior and HIV risk perception emerged in Brazil in response to the growing number of diagnosed and notified Aids cases. This tendency was observed likewise in Australia, France, England, the United States, among other countries.[4,6,7,a]

[a] ANRS/INSERM/INED. Dossier de presse - Premiers résultats de l'enquête "Contexte de la sexualité en France" (CSF). Available from: http://www.anrs.fr/index.php/anrs/rubriques _transversales/presse [Cited 2007 Aug 21].

Population studies on sexual behavior have also been conducted in Latin America, Chile and Argentina, providing parameters for comparison that are closer to the Brazilian reality.[a,b]

Until then, information on condom use in Brazil was, in large part, associated to contraception and generally derived from population studies, such as the *Pesquisa Nacional de Demografia e Saúde* (PNDS[c] – National Survey on Health and Demography), conducted with reproductive aged married women, or with those co-habiting with a partner. Within this context, condom use was not frequently referred to as a contraceptive method.[2] In 1986, only 5% of the women who were married or cohabiting with a partner stated condom was their current contraceptive method.[d]

However, when the 1996 PNDS added a module on STD/Aids, it was possible to obtain information on the use of condoms as a means of HIV prevention. Thus, although 4.3% of the sexually active women interviewed in 1996 stated that the condom was their current contraceptive method,[c] 11% stated they had used it the last time they had sexual intercourse.[e]

In order to study behavior, attitudes and sexual practices of the Brazilian population, so as to formulate strategies for preventing STD/AIDS, the Ministry of Health signed an agreement with the *Centro Brasileiro de Análise e Planejamento* (CEBRAP) to conduct a study entitled, "*Comportamento Sexual da População Brasileira e Percepções sobre HIV/Aids*" ("Sexual Behavior of the Brazilian Population and Perceptions of HIV/Aids").[f] Conducted in 1998, this was the first nationwide population survey to produce data on the prevalence of condom use and its sociodemographic differentials among both sexes of the Brazilian urban population aged 16 to 65 years.

In 2003 and 2004, two other national population surveys were conducted in order to construct indicators for a systematic evaluation of the performance of the National Coordination of the DST/AIDS Program.[g,h] These surveys produced data on the profile of condom use and its sociodemographic differentials among youth and adults of both sexes.

These studies, as well as specific population studies on youth,[5] made it possible to produce a set of valuable data on sexual behavior and condom use among the Brazilian population during the past decade.

The objective of re-editing the survey "Sexual Behavior of the Brazilian Population and its Perception of HIV/Aids", 2005,[i] was to identify changes or continuities in knowledge regarding HIV/Aids, behavior, attitudes and sexual practices since 1998. Thus, for the first time it becomes possible to draw historical comparisons from data produced from population surveys undertaken with samples and instruments designed for this purpose.

The objective of the present study was to analyze the levels, trends and sociodemographic differentials of condom use among the Brazilian population.

METHODS

Data analyzed refers to the results of the study "Sexual Behavior and Perceptions of the Brazilian Population on HIV/Aids", conducted in 2005[i] and compared to a similar study conducted in 1998.[f]

The 1998 and 2005 surveys were cross-sectional cohort studies based on representative probabilistic samples of the Brazilian urban population established on the basis of micro-areas defined by the *Instituto Brasileiro de Geografia e Estatística* (IBGE –Brazilian Institute of Geography and Statistics). The multistage stratified cluster design, randomly selected, successively, in each micro-region, census sectors, private homes and inhabitants aged 16 to 65 years. In 1998, the geographic strata defined were: North and Northeastern regions; Central-West plus the States of Minas Gerais and Espírito Santo; the Southern region plus the States of Rio de Janeiro and São Paulo. In 2005, the strata were: the North and Northeastern regions; Central-West and Southeastern region except for São Paulo, and the Southern region plus São Paulo. Adaptations were made in the clusters so as to guarantee that the results of both surveys could be compared. The samples were composed of 3,324 and 5,040 individuals, respectively, in 1998 and 2005. Details on research methodology and sample design may be found in Berquó et al[1] and Bussab.[3]

The study of the prevalence of condom use in both surveys was based on information on this behavior during first sexual intercourse and during the past twelve months prior to the face to face interview. In the present article, only condom use during the past 12 months was considered for analysis, delimiting sub-samples of 2,578 and 3,960 people, in 1998 and 2005 respectively that represent 77.6% and 78.6% of the respective total samples. Data was analyzed concerning people who stated they had sexual intercourse: only with steady partners, only with eventual partners, and with both kinds of partners. Steady partners were defined as married, cohabiting, engaged, boyfriends, girlfriends or lovers, that involves any form of involvement or commitment, and eventual partners were defined as a sexual relationship without any kind of bond or commitment with regard to continuity. Condom use was considered as affirmative statements as to its use and that it has been used in at least one sexual intercourse in the 12 months prior to the interview. Consistent use, incorporated only in the 2005 survey, was defined as condom use in all sexual intercourse occurring in the past 12 months or if it began to be used always. Condom use or consistent use were defined for sexual intercourse with both steady and eventual partners.

Analysis of condom use in the most recent sexual intercourse, possible only with respect to the 2005 survey, was based on a sample of all sexually active individuals and was evaluated according to the kind of sexual practice: "only vaginal" or "vaginal and anal in the same intercourse", with a steady or eventual partner.

In general, the independent variables analysed corresponded to sociodemographic characteristics of the people interviewed: sex, age, race/color, educational level, marital status, current religion and region of residence, as well as the calendar year of the study, for information available on both surveys. Regarding educational level, the categories basic (junior high school), middle (high school) and upper (college) level refer to complete and incomplete schooling. People that replied, "does not know how to read and write" were excluded from analysis due to the reduced number of cases. The criteria of self-identification and the categories utilized by the IBGE for race/color were adopted: Whites, Blacks, Mulattoes, Indigenous and Yellows. However, the reduced number of indigenous and yellows justified the exclusion of these categories from analysis. The category "Blacks" refers to Blacks and Mulattoes. The denomination "others" in the category current religion refers primarily to Spiritualist, Afro-Brazilian and Buddhist.

The total numbers presented in the tables may not necessarily be the same as the sum of the cases of the different categories of a variable, due to data weighting and/or missing information ("does not recall" or "refuses to reply"). The weighting aforementioned

was undertaken in order to correct the probability of inclusion of the households in the samples.

The statistical treatment of data was based on chi-square tests, corrected by the sample design, and calculations of the odds ratio (OR) was obtained from univariate logistic models. Multivariate analysis involved the adjustment of logistic regression models, controlling all other interest variables with the objective of investigating those variables that were more associated with condom use. In order to construct these models, a model with all the main effects corresponding to the independent variables previously described was initially considered. Then each first order interaction was included (one at a time) into the model, with its principal effects. Only those that presented values of $p<0.05$, were incorporated into the final model. All the logistic models were adjusted considering the sample design. Calculations were made in SPSS v.15 and Stata v.9.

The project of the survey "*Comportamento Sexual e Percepções da População Brasileira sobre HIV/Aids*" was approved by the Ethics Committee of Faculdade de Saúde Pública of Universidade de São Paulo.

RESULTS

The results of the univariate analysis regarding condom use in the 12 months prior to the interview for people with steady partners, eventual partners and both steady and eventual partners are presented on Table 1. For people with steady partners in the 12 months prior to the interview, the proportion of condom use increased from 19.1% in 1998 to 33.1%, in 2005 ($p<0.001$). In 2005, condom use was not associated to sex and race/color, but it varied significantly with age, educational level, marital status, current religion and region. A greater percentage of condom use was found among youth aged 16 to 24 years (59.2%), decreasing with age. People who had only reached the basic level of education, having completed it or not, used condoms less frequently (26.2%) than those who had attained higher levels of education (more than 40%). A statistical gradient characterized marital status, being that condom use was more frequent among singles (70.3%). Those individuals who did not have any religious affiliation or who belonged to other religious denominations less frequent in Brazil responded for approximately 41% of the people who stated they used condoms. Finally, the regions where the largest proportions of condom use were declared were the North/Northeastern and Southern regions.

A comparison of the results from the 1998 and the 2005 surveys reveals significant effects of current religion and region only in 2005.

Logistic regression reaffirmed findings from the univariate analysis and indicated there was an interaction

Table 1. Condom use in the 12 months prior to the interview and odds ratio of use and non use according to sociodemographic characteristics. Brazil, 1998 and 2005.*

Variables	Stable partnerships only						Eventual partnerships only						Stable and eventual partnerships					
	2005			1998			2005			1998			2005			1998		
	CU(%)	N Total	OR	CU(%)	N Total	OR	CU(%)	N Total	OR	CU(%)	N Total	OR	CU(%)	N Total	OR	CU(%)	N Total	OR
Sex	p=0.199			p=0.638			p=0.023			p=0.651			p=0.720			p=0.612		
Male	31.7	1490		18.1	932		81.6	228	2.4**	63.3	147		45.7	278		23.3	267	
Female	34.2	1852		19.9	1168		66.0	53		66.7	9		48.8	59		29.6	55	
Age group (yrs)	p<0.001			p<0.001			p<0.001			p=0.019			p<0.001			p=0.055		
16-24	59.2	552	7.9**	34.6	347	7.1**	92.0	137	7.7**	81.7	82	6.9**	59.7	149	6.7**	32.5	146	
25-34	41.2	929	3.8**	26.6	627	4.9**	67.2	61	1.5	38.0	50	1.0	45.7	98	3.8**	28.3	82	
35-44	28.7	818	2.2**	13.5	571	2.1	70.2	47	1.6	62.5	16	2.7	28.1	52	1.7	10.2	68	
45-65	15.4	1043	1.0	6.9	554	1.0	59.5	37	1.0	44.4	9	1.2	18.2	36	1.0	4.1	26	
Educational level	p<0.001			p=0.017			p=0.003			p<0.001			p=0.006			p=0.039		
Basic	26.2	1528	1.0	15.0	1191	1.0	69.9	113	1.0	46.6	88	1.0	32.4	116	1.0	33.2	166	8.5**
High School	40.6	1108	1.9**	23.7	536	1.8**	86.5	111	2.7**	91.3	46	11.8**	57.1	128	2.8**	18.9	107	4.0
College	44.8	507	2.3**	35.0	223	3.0**	94.6	37	8.2**	81.8	11	4.2**	51.9	72	2.2**	5.6	36	1.0
Color	p=0.717			p=0.374			p=0.650			p=0.315			p=0.141			p=0.915		
White	33.3	1581		21.0	1064		79.8	124		59.8	102		52.1	137		24.5	174	
Black	32.6	1661		17.4	893		77.1	153		73.8	42		42.4	195		23.5	132	
Marital status	p<0.001			p<0.001			p=0.144			p=0.481			p<0.001			p=0.002		
Married/cohabiting	24.2	2622	1.0	11.1	1755	1.0	53.3	7		-	0		21.0	125	1.0	11.1	121	1.4
Widowed/separated/divorced	45.9	137	2.7**	47.5	59	7.2**	71.1	37		50.0	16		53.1	29	4.2**	8.2	10	1.0
Single	70.3	583	7.4**	63.1	287	13.8**	80.6	237		65.0	140		62.4	183	6.2**	33.6	191	5.7**
Religion	p=0.010			p=0.149			p=0.512			p=0.093			p=0.039			p=0.161		
Catholic	32.7	2202	1.2	20.5	1457		76.9	185		64.8	119		54.1	189	3.2**	23.5	220	
Protestant	31.9	273	1.2	20.4	125		78.3	20		96.0	4		29.3	19	1.1	42.6	5	
Pentecostal	28.1	460	1.0	9.8	236		67.2	15		78.7	6		26.8	47	1.0	58.9	20	
None	41.4	259	1.8**	27.0	148		91.2	37		39.1	21		43.9	59	2.1	16.6	71	
Others	41.8	147	1.8**	11.0	127		80.1	24		90.9	6		40.3	23	1.8	17.2	6	
Region	p=0.015			p=0.926			p=0.002			p=0.736			p=0.830			p=0.362		
North/Northeast	37.5	813	1.4**	20.0	494		78.4	97	2.1**	68.8	48		44.2	117		33.5	114	
Central-West/Southeast	30.4	1003	1.0	19.4	741		64.0	75	1.0	65.9	44		43.9	93		15.0	124	
Sao Paulo	30.2	990	1.0	19.5	580		88.3	77	4.5**	52.3	44		49.2	94		28.5	51	
South	36.7	537	1.3**	16.1	286		87.9	33	4.7**	70.0	20		51.9	33		21.6	33	
Total	33.1	3342		19.1	2100		78.6	281		63.5	156		46.3	337		24.5	322	

CU: Condom use
Value of p refers to the chi-square test corrected by the sample design.
*OR - Odds ratio significantly different from 1, with p<0.05.

between the year of the survey and marital status. Figure 1 indicates that the greatest increase in condom use between 1998 and 2005 was among married or cohabiting respondents, 11.6% and 25.0% respectively.

Condom use in the 12 months prior to interview among people who reported they only had eventual partners, increased from 63.5% to 78.6% between 1998 and 2005, but this was not statistically significant (p=0.065). However, these individuals used condoms more frequently than those who had steady partnerships. (Table 1)

In 2005, condom use among people who declared they only had eventual partners was not associated to race/color, marital status or religion, but was associated to sex, age, educational level, and region of residence. Among men in this category, the rate of condom use was 81.6%, and among women it was 66.0%; it reached the rate of 92% among youth aged 16 to 24 years, which was higher than that found among all other age groups, whose rates were equivalent among themselves. As to the educational level, a significantly lower rate of condom use was found among individuals with a basic level of education (69.9%), that is, those who had or had not completed junior high school. There were no significant differences as to condom use among individuals with higher levels of education. The Central-West/South-eastern region presented the lowest rate of condom use (64.0%), statistically lower than all other regions which did not differ among themselves. (Table 1)

A comparison of the results from 2005 and 1998 (Table 1) reveals a similar panorama with respect to the variables associated to condom use. Sex and region of residence are exceptions for in 1998 they did not present significant associations with condom use.

Due to the small number of women who reported they had eventual partners, (nine in 1998 and 53 in 2005), logistic regression analysis considered only single men in this category (98.3% of all the men) and in the age groups 16-24 and 25-34 years. Furthermore, for this sub-sample, educational level and religion were evaluated considering only two categories: basic education or high school plus college education, and Catholics or all other religions.

Thus, in 1998, among single men aged 16 to 34 years, condoms were used more frequently among the younger men and those who had a higher educational level. In 2005, condoms were used more frequently among younger single men and those who resided in the Southern region and in the State of Sao Paulo. (Table 2)

Logistic regression analysis indicated the interaction between educational level and age group (p=0.004) and the main effect of the calendar year (p=0.015). The chance of using condoms in relation to not using them, in 2005, was 1.2 times greater then it was in 1998. In 1998, condoms were more frequently used among

Table 2. Condom use among single men aged 16 to 34 years who only had eventual partners in the 12 months prior to the interview and odds ratios of use and non use, according to sociodemographic characteristics. Brazil, 1998 and 2005.*

Variable	2005			1998		
	CU (%)	N Total	OR	CU (%)	N Total	OR
Age group (yrs)	p=0.002			p=0.011		
16-24	93.7	126	7.1**	81.0	81	7.9**
25-34	67.7	44	1.0	35.2	45	1.0
Educational level	p=0.092			p<0.001		
Basic	78.7	59		41.2	69	1.0
High school/ college	91.9	105		93.1	50	19.2**
Color/race	p=0.728			p=0.728		
White	88.1	78		62.5	86	
Black	85.6	90		75.4	36	
Religion	P=0.867			P=0.665		
Catholic	86.1	109		66.7	96	
Others	87.2	65		58.1	30	
Region	p=0.030			p=0.492		
North/ Northeast	85.1	54	2.2	72.9	37	
Central-West/ Southeast	72.3	41	1.0	72.7	35	
State of São Paulo	95.8	52	8.8	45.1	35	
South	97.1	23	13.0**	69.7	19	
Total	86.9	170		64.7	126	

CU: Condom use.
* P-value refers to the chi-square test corrected by the sample design.
** OR - Odds ratio significantly different from 1, with p<0.05.

single men with high school and/or college education in both age groups. In 2005, single men aged 16-24 years presented a significant difference with respect to educational level, however this did not hold true for those aged 25 to 34 years. (Figure 2)

For people in stable relationships, but who also had eventual partners in the 12 months prior to the interview, condom use increased from 24.5%, in 1998, to 46.3%, in 2005 (p=0.001). For both years, these rates were closer to those found among respondents with steady partners than to those found among respondents with eventual partners.

The statistical analysis indicated that, in 2005, condom use was associated to age, educational level, marital status and religion. When compared to the results from 1998, the associations with educational level and marital status were maintained. As to educational level, the negative association observed in 1998 looses

significance (p=0.051) when the category basic education is compared to a category that unifies high school and college education. The rate of condom use among individuals in the latter category was 15.6%. (Data not shown in Table)

Among respondents who only had steady partners, 17.1% stated they used condoms in a consistent manner. This pattern was not associated to sex, race/color or region of residence, however it was associated to age, educational level, marital status and religion. The largest frequency of consistent condom use, 31.9%, was found among youth aged 16 to 24 years, and this value declined with increasing age. People who had at most completed basic education presented a lower rate of consistent condom use when compared to those who had a higher level of education. Those who had either a high school or college education presented a rate of approximately 22% of condom use. A statisti-

Table 3. Consistent condom use in the 12 months prior to the interview and odds ratios of use and non use, according to sociodemographic characteristics. Brazil, 2005.*

Variable	Stable partnerships only			Singles with eventual partnerships only			Both stable and eventual partnerships		
	CCU (%)	N Total	OR	CCU (%)	N Total	OR	CCU (%)	N Total	OR
Sex	p=0.816			p=0.034			p=0.930		
Male	16.9	1489		70.6	204	2.8**	27.8	277	
Female	17.2	1851		46.3	31	1.0	28.8	59	
Age group (yrs)	p<0.001			p=0.013			p=0.012		
16-24	31.9	552	4.9**	77.1	136	3.7**	37.6	149	4.0**
25-34	19.9	928	2.6**	59.3	54	1.6	24.2	99	2.1
35-44	14.7	817	1.8**	47.5***	45	1.0	17.3	52	1.3
45-65	8.6	1044	1.0				13.9	36	1.0
Educational level	p<0.001			p=0.281			p=0.338		
Basic	12.8	1527	1.0	62.5	88		23.3	116	
High School	22.0	1107	1.9**	69.2	104		32.8	128	
College	22.6	505	2.0**	82.8	28		26.4	72	
Color/race	p=0.727			p=0.478			p=0.015		
White	17.2	1580		70.8	101		37.2	137	2.1**
Black	16.7	1659		64.8	130		22.1	195	1.0
Marital status	p<0.001						p<0.001		
Married /cohabiting	10.2	2619	1.0				12.6	125	1.0
Widowed/separated/divorced	30.5	137	3.9**				27.9	29	2.7
Single	44.7	583	7.1**				38.3	183	4.3**
Religion	p=0.005			p=0.935			p=0.468		
Catholic	17.2	2200	1.4	69.1	151		30.3	189	
Protestant	14.1	273	1.1	57.1	16		20.5	18	
Pentecostal	12.8	459	1.0	69.5	12		20.6	47	
None	21.8	259	1.9**	68.5	33		33.2	59	
Others	26.2	147	2.4**	60.4	23		15.0	23	
Region	p=0.650			p=0.097			p=0.518		
North/Northeast	17.7	813		64.1	81		23.3	116	
Central-West/Southeast	15.8	1002		54.9	64		26.1	92	
State of São Paulo	17.2	989		75.5	62		31.9	94	
South	18.5	536		87.2	28		37.5	32	
Total	17.1	3340		67.4	235		28.0	336	

CCU= Consistent condom use.
* Value of p refers to chi-square test corrected by the sample design.
** OR - Odds ratio significantly different from 1, with p<0.05.
*** Includes people aged 35 to 65 years.

cal gradient was observed for consistent condom use and marital status. A higher rate of consistent use was found among singles than among married or cohabiting respondents. As to religion, the highest rate of condom use was found among the categories "none" and "other religions" that did not differ between themselves and the lowest rates of condom use were found among the protestant and Pentecostal religions. (Table 3)

The logistic regression model indicated interaction between marital status and age group (p=0.005) and sex (p=0.002). Whereas, among married/cohabiting respondents, rates of consistent condom use decreases with age, from 17.3% among youth aged 16-24 years to 7.1% among respondents aged 45-65 years, among singles this decline starts among respondents aged 35-44 years. Consistent condom use among widows, widowers, separated and divorced respondents begins to declines at the age of 44 years. However, this last result should be considered with caution due to the small number of cases involved. (Figure 3)

Rates of consistent condom use among men varied from 9.1% for those who were married/cohabiting, to 27.3% for those who were widowed/separated/ divorced and 52.8% for singles. Women presented the same tendency, with higher magnitudes of consistent condom use among the single women than single men: 11.7%, 33.4% and 37.2%, respectively.

Considering all respondents who only had eventual partners in the 12 months prior to the interview, the rate of consistent condom use was 65.0%.

Given the small number of respondents in this category (n=279) and the concentration of single men within it (84.2%), analysis of this subsample resulted in a 67.4% rate of consistent condom use, being that this proportion was higher when only men were considered (70.6%) and among young people of both sexes (77.1%) (Table 3).

Adjustment of the logistic model for singles considering the effects of sex, age group and interaction between these variables did not indicate an effect of interaction (p=0.591). Analysis of consistent condom use according to age group, controlling for the sex variable, indicated significance (p=0.020). However, when analyzing sex and controlling for the factor age group this did not occur (p=0.107).

For people with steadye and eventual partners during the 12 months prior to the interview, the rate of consistent condom use was 28.0%, and it was influenced by age group, marital status and race/color. In order to evaluate the effects of interaction in the multivariate model, the following age groups were analyzed: 16-24, 25-34 and 35-65 years. Considering the results of univariate analysis, religion and marital status were unified under the categories "Catholics" versus "other religions", and "not united" (singles, widowed, separated and divorced) versus "united".

The multivariate model indicated interaction between sex and age group (p=0.045), as well as significant

Table 4. Condom use in the most recent sexual relation (vaginal sex) considering the last 12 months prior to the interview and odds ratios of use and non use, according to sociodemographic characteristics. Brazil, 2005.*
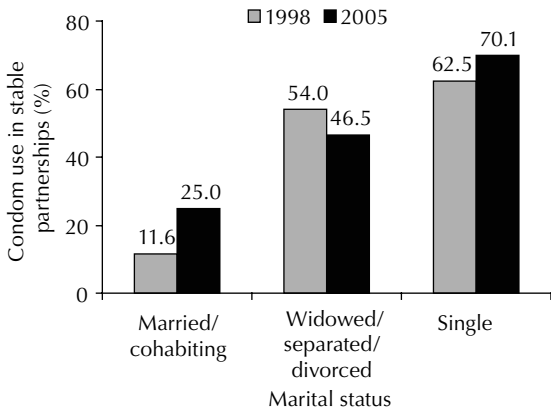
Variable	Use in most recent intercourse (%)	N Total	OR
Sex	p<0.001		
Male	32.5	1922	1.5**
Female	23.7	1892	1.0
Age group (yrs)	p<0.001		
16-24	55.5	832	9.3**
25-34	29.6	1021	3.1**
35-44	20.5	882	1.9**
45-65	11.9	1080	1.0
Educational level	p<0.001		
Basic	20.3	1691	1.0
High School	36.6	1299	2.3**
College	36.6	593	2.3**
Color/race	p=0.986		
White	28.2	1779	
Black	28.1	1930	
Marital status	p<0.001		
Married/ cohabiting	13.9	2662	1.0
Widowed/ separated/divor	43.9	204	4.8**
Single	64.7	948	11.4**
Current religion	p<0.001		
Catholic	28.2	2472	1.5**
Protestant	27.4	311	1.4
Pentecostal	20.9	512	1.0
None	34.8	330	2.0**
Others	36.7	185	2.0**
Type of partner	p<0.001		
Steady	23.4	3488	1.0
Eventual	79.1	325	12.3**
Region	p=0.004		
North/Northeast	32.2	988	1.5**
Central-West/ Southeast	23.7	1123	1.0
Sao Paulo	27.7	1102	1.2
South	30.6	601	1.4**
Total	28.1	3814	

* P-value of p refers to chi-square test corrected by the sample design.
** OR-Odds ratio significantly different from 1, with p<0.05.

Figure 1. Condom use among people who only had stable partners in the 12 months prior to the interviews, according to marital status and year. Brazil, 1998 and 2005.
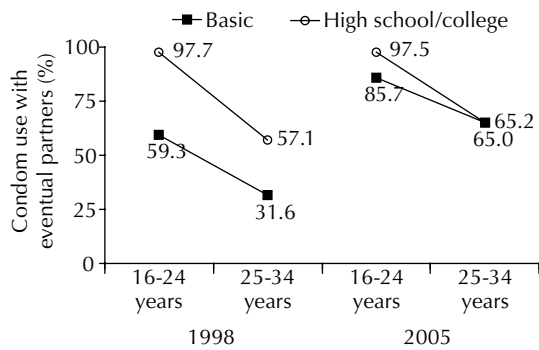
Figure 2. Condom use among single men aged 16 to 34 years, who only had eventual partners in the 12 months prior to the interview, according to educational level and age group. Brazil, 1998 and 2005.

effects for race/color (p=0.025) and marital status (p=0.008). In the multivariate analysis as in the univariate analysis, religion and educational level were not significantly associated to consistent condom use among respondents with steady and eventual partners (both with p>0.57). Results indicated that the rate of consistent condom use among men decreased from 42.6% in the 16-24 years age group, to 7.8% for those respondents aged 35 to 65 years. Approximately 24% of the women aged 16-24 years and 25-34 years reported consistent condom use. This rate increased to 36.0%, among older women.

For the 3.814 respondents who practiced only vaginal intercourse in their most recent sexual relationship, 28.1% responded they used the condom. Univariate analysis indicated that all variables except race/color were associated to condom use. More men and younger respondents stated they used the condom in their most recent sexual intercourse. A higher educational level as well as being single or having eventual partners increased the probability of condom use in the respon-
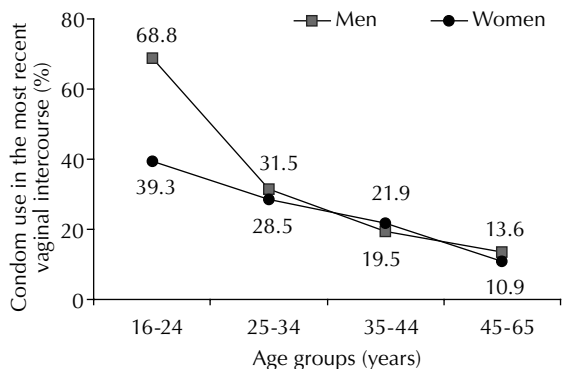
dent's most recent sexual intercourse. Pentecostals had the lowest percentage of condom use. Residents of the Central-West and Southeastern regions presented the lowest percentage of condom use (23.7%). (Table 4)

Multivariate analysis indicated that condom use was associated to combinations between sex and age group (p=0.003), and between religion and type of partnership (p=0.020). Figure 4 illustrates the interaction between sex and age group, with a large difference as to condom use among male and female respondents aged 16 to 24 years.

As to the interaction between religion and type of partnership, Pentecostals with stable unions represented 17.8% of those who used condoms in their most recent sexual intercourse, whereas the rate among Catholics and protestants was 24.0% (average value), and among respondents with other religious affiliations or with no religion it was 29.0%. When the most recent sexual intercourse occurred with an eventual partner the same pattern of interaction was not observed.
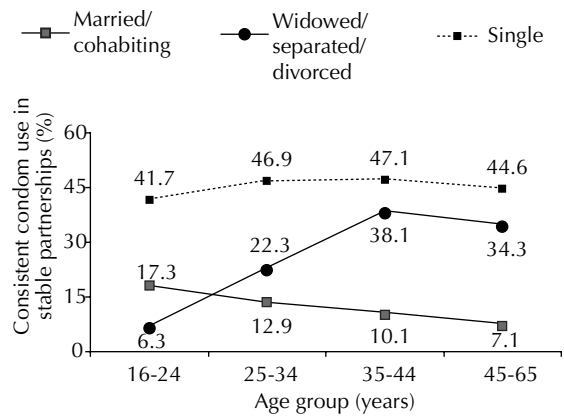
Figure 3. Consistent use of condoms among people who only had stable partners in the 12 months prior to the interview, according to age group and marital status. Brazil, 2005.

Figure 4. Condom use in the most recent sexual intercourse (vaginal sex) in the 12 months prior to the interview, according to age group and sex. Brazil, 2005.

The practice of vaginal and anal intercourse in the same sexual relation was reported by 122 respondents, and only anal sex by five respondents. Analysis of this practice revealed that 41.8% of the respondents used the condom in both vaginal and anal intercourse, 4.9% utilized it in only one of these practices and 53.3% did not use it in either of these practices. Behavior differed according to the type of partner, being condom use in both practices more frequent when the sexual partner was eventual (59.5%) than when it was a steady partner (32.6%).

Univariate analysis of condom use in both vaginal and anal intercourse in the same sexual relation revealed that educational level and marital status presented significant statistical effects, being condom use more frequent among singles and respondents with higher levels of education.

Given the reduced number of cases, it was not possible to perform logistic regression analysis for the combined study of main effects and interactions.

DISCUSSION

Compared with 1998, in 2005 a substantial increase in condom use in the 12 months prior to the interview was observed in all types of partnerships analyzed: approximately 14% among men and women in stable relationships, 15% among those who only had eventual partners and 22% among those who had both steady and eventual partners.

Since there was no data in the 1998 survey on condom use in the most recent sexual intercourse, data from the 2005 survey was compared to data from the PNDS-96.[a] It was observed that the proportion of condom use in the most recent sexual intercourse had increased from 11.4%, in 1996,[b] to 28.1%, in 2005. Youth aged 16 to 24 years reported the greatest increase in condom use during that period, among whom it varied from 19.5%[a] to 55.5%. No published data was found that would make it possible to compare this kind of condom use with the type of partnership or consistent condom use over time.

On the other hand, it was observed that a gradient of use according to the kind of partner was maintained over time. Respondents who only had eventual partners kept protecting themselves more than those who had both kinds of partners and the latter, in turn protected themselves more than people who only had steady partners.

This gradient was also observed with respect to consistent condom use in the 2005 survey. Likewise, condom use in the most recent sexual relation was much more frequent among eventual partners in 2005.

Discussion of the results of the present study in comparison to those of other studies conducted in Brazil is very difficult due, in part, to the reduced number of nationwide studies, in part due to the characteristics of each study and, finally due to the fact that analysis of temporal tendencies are non-existent.

Thus, it may be observed that a trend towards an increase in condom use, as indicated in the present study, is corroborated by data from Szwarcwald et al,[c] who studied condom use by means of self-applied questionnaires among individuals aged 15 to 54 years, living in urban and rural Brazilian macro-regions. These results do not, therefore, corroborate the trend towards decreasing condom use identified by Paiva et al,[d] when analyzing data produced by the *Instituto Brasileiro de Opinião Pública e Estatística* (IBOPE – Brazilian Institute of Public Opinion and Statistics) in 2003. A possible explanation for these differences is that Paiva et al[d] utilized data that referred to the sexually active population in the six months prior to the interview, a design that is not very common in research on sexual behavior.

In the present study the mean frequency of consistent condom use was 21.0%, irrespective of the type of partnership, whereas in Szwarcwald et al's[c] study it was 25.3%.

As to condom use in the most recent sexual intercourse, Szwarcwald et al[c] reported a proportion of 38.4%, a value higher than that verified in 2005, of 30.9%. In order to make this comparison, individuals aged 55 to 65 years in the 2005 survey were not considered. However, variations in the sample design, in the definition of the variables and in the manner in which the questionnaire was applied in the two studies may explain these differences.

On the other hand, the rate of condom use in the most recent sexual intercourse among youth aged 15 to 24 years was 55.5% in 2005, similar to the rate found by Szwarcwald et al,[c] of 57.3%, who also observed a declining tendency with increasing age. In a study with youth aged 18 to 24 years, conducted in 2002 in three Brazilian capitals,[8] a 51% rate of condom use in the most recent sexual relation was observed.

In the present study, in 2005, age, educational level, marital status and type of partnership were associated to condom use in the 12 months prior to the interview and to its use in the most recent sexual intercourse, confirming the tendency verified in 1998.

[a] Sociedade Civil Bem-Estar Familiar no Brasil. Pesquisa Nacional sobre Demografia e Saúde 1996. Brasília; 1997.
[b] HIV/AIDS Indicators Database [homepage]. Available from: http://www.measuredhs.com/hivdata [Cited 2008 Apr 2].
[c] Ministério da Saúde. Coordenação Nacional DST/AIDS. Pesquisa de comportamento, atitudes e práticas na população brasileira de 15 a 54 anos, 2004. Brasília; 2006.
[d] Paiva V, Venturi G, França-Junior I, Lopes F. Uso de preservativos – Pesquisa Nacional MS/IBOPE, 2003. Available from: http://www.aids.gov. br/data/documents/storedDocuments/%7BB8EF5DAF-23AE-4891-AD36-1903553A3174%7D/%7BC2A7F400-0F86- [Cited 2007 Jun 25]

The young population protects itself more frequently in sexual intercourse, for all three modalities of condom use studied. Likewise, the population with a higher level of education also presents higher proportions of condom use. As to marital status, singles, divorced/separated/widowed and married/cohabiting respondents establish a gradient with larger proportions of condom use among the singles.

The same phenomenon is observed when the type of partnership is taken into consideration, as has already been pointed out: condom use is always greater among eventual partners than among steady partners. These findings are similar to those observed by Szwarcwald et al,[a] Paiva et al[b] and in similar studies conducted in Chile and Argentina.[c,d]

In sexual relations with eventual partners, men reported using the condoms more frequently and more consistently than women, findings also observed by Szwarcwald et al[a] and Paiva et al,[b] although there is no information available concerning the statistical significance of these differences. However, in the logistic model, the associations referring to eventual partners did not maintain their significance, and no articles were found in the national literature that would permit a comparison with these results.

Differences between men and women only confirmed themselves with respect to condom use in the most recent sexual intercourse. Men tended to use condoms more frequently then women, a result which is similar to the rate of 44.2% among men and 32.5% among women found by Szwarcwald et al.[a] However, in the logistic model, the difference found limited itself to the population aged 16-24 years, that is, young men tended to use condoms more frequently than young women. Similarly, according to Teixeira et al,[8] 56.0% of the young men and 38.8% of the young women stated they used condoms in the most recent sexual relation.

An understanding of the differences found between men and women as to condom use requires specific analysis for each of the sexes, for choices made by men and women in their sexual trajectories are intimately related to existing gender differences regarding conceptions as to sexual-affective bonds. These, in turn, are linked to perceptions with respect to the need for protection,[8,e] which result in the greater difficulty confronted by women in negotiating condom use and the statute of the relationship.

Religious affiliation influenced condom use in stable relationships. Protestants and Pentecostals used condoms least frequently, and this result repeated itself among Pentecostals when asked about their most recent sexual relation. The largest rates of protection always corresponded to respondents with "no religion" or adepts of "other" religions. No comparable data was found in the literature on nationwide studies. Teixeira et al[8] did not find any association between condom use among youth and affiliation to any religion, a category that combined all religious creeds, not comparable to the present study. However, in a study with 800 young people in Rio de Janeiro, higher rates of condom use were observed among those with no religious affiliation, approximately 66%, and lower rates, 28%, were found among Pentecostals and Protestants

Self-declared color was only found to be associated to consistent condom use among those who replied they had both steady and eventual partners. No comparable nationwide data was found. One hypothesis that should be tested in future analysis is whether the power to negotiate varies according to the presence or absence of racial homogamy.

As to regional differences, the Central-West/Southeastern region (that does not include the State of São Paulo) tends to present the lowest levels of condom use. From a regional perspective, Pascon et al[f] found, in an analysis with no adjustments for other variables, significant differences in consistent condom use with any partner, being that the lowest rates were found in the North/Northeast, which is not corroborated by the 2005 survey.

In conclusion, the results of the present study indicate a significant increase in condom use in the past years, a result of the efforts of the official STD/AIDS prevention programs. On the other hand the systematic differential with respect to educational level and condom use reveals the need to reflect upon policies regarding access to information and prevention geared towards the population with lower levels of education. Likewise, more thorough, in-depth discussions concerning action that is geared towards increasing consistent condom use, particularly among the more vulnerable populations such as young women or those in steady partnerships are necessary.

[a] Ministério da Saúde. Coordenação Nacional DST/AIDS. Pesquisa de comportamento, atitudes e práticas na população brasileira de 15 a 54 anos, 2004. Brasília; 2006.
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