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Changes in HIV testing in Brazil between 1998 and 2005

ABSTRACT

OBJECTIVE: To analize changes in HIV testing, reasons reported by those who were tested or not and received counseling.

METHODS: Cross-sectional studies conducted in both men and women aged 16 to 65 years based on representative samples of urban Brazil in 1998 (n=3,600) and 2005 (n=5,040). Sociodemographic, sexual, reproductive characteristics, life experiences and health data were collected and analyzed. Potential differences in the distribution of variables was analyzed using Pearson's chi-square and design-based F test ($\alpha<5\%$).

RESULTS: In 1998 and 2005, 20.2% and 33.6% of interviewees had been tested, respectively. A total of 60% women aged 25–34 years were tested, but those who reported sexual initiation before the age of 16 and four or more sexual partners in the fi ve years prior to the interview were less tested. There was no significant increase in testing among men, except among those aged 55–65 years, per capita income between 1–3 and 5–10 monthly minimum wages, retired, historical Protestant and followers of African-Brazilian religions, living in the North/Northeast region and who reported homosexual/bisexual partners or no sexual relationship in the five years prior to the interview. Testing rates did not increase in those who self-reported as high risk for HIV. Among women, prenatal testing rate increased while work-related testing decreased among men. In 2005, half of those who were tested did not receive any advice before or after testing.

CONCLUSIONS: HIV testing scaling up was unequal and was mostly seen among women at childbearing age, adults and those better off. There seems to be an increase in testing rates in Brazil but without regard for people's right to free choice and without offering more widely and better quality counseling.

DESCRIPTORS: Acquired Immunodeficiency Syndrome, diagnosis. HIV. Socioeconomic Factors. Health Knowledge, Attitudes, Practice. Health Inequalities. Cross-Sectional Studies. Population Studies in Public Health. Brazil. Cross-sectional studies.

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INTRODUCTION

HIV testing was first approved in 1985 for blood and blood product control. Voluntary testing along with counseling for those at increased risk was also recommended to be offered in health services as part of primary and secondary prevention.[31,a,b] In São Paulo, southeast Brazil, HIV testing became available in 1986 as a result of civil society's pushing the State House of Representatives for

[a] Ministério da Saúde. Coordenação Nacional de DST/AIDS. Aconselhamento: um desafio para prática integral em saúde - avaliação das ações. Brasília; 1999.
[b] Wolffenbüttel K. A organização tecnológica do Centro de Testagem e Aconselhamento (CTA) no enfrentamento da epidemia de DST/Aids no Estado de São Paulo. [Master's dissertation]. São Paulo: Faculdade de Ciências Médicas da Santa Casa de São Paulo; 2006.

making HIV screening test mandatory at blood banks.[a] In 1988, HIV testing became mandatory nationwide.[b]

Between 1987 and 1988, there were created Centers for Testing and Counseling (CTA), then called Centers for Serological Advice and Support (COAS) that mainly provided free, confidential and anonymous testing to the so-called "risk groups," i.e., male homosexuals, sex workers and intravenous drug users.[c]

The introduction of highly active antiretroviral therapy (HAART) in 1996, as a right in Brazil, made testing a diagnostic tool to detect those who needed and were eligible to receive HAART. As a preventive action, early diagnosis aims at providing comprehensive medical care to reduce disease burden and mortality and thus reduce vertical, sexual and parenteral transmission by decreasing viral load and HIV circulation in the blood stream.[8]

Given the notorious stigma and discrimination accompanying HIV/AIDS since the beginning of the epidemic,[22] scaling up HIV testing was based on the following regulating principles: counseling and information on HIV/AIDS before and after testing; testee's explicit voluntary and informed consent; and confidentiality of testing results.[d] It is thus intended to integrate freedom (private autonomy) and equity (health and education) rights.[12]

The purpose of the present study was to analyze changes in HIV testing, the reasons reported by those who were tested or not tested and received counseling.

METHODS

The analyses refer to findings of the survey "Comportamento Sexual e Percepções da População Brasileira sobre HIV/Aids"[e] (Sexual behavior and perceptions of the Brazilian population regarding HIV/AIDS), carried out in 2005, compared with a similar survey carried out in 1998.[f]

Both surveys consisted of representative samples of Brazilian urban population based on the microareas defined by the Instituto Brasileiro de Geografia e Estatística (IBGE – Brazilian Institute of Geography and Statistics). Using a stratified multi-stage sampling, census tracts, private households and individuals aged between 16 and 65 years were randomly and successively drawn in each microregion.

For the 2005 survey, the criterion for microregion selection was modified to include more urban areas compared to the 1998 sample.[6]

The final 1998 and 2005 samples consisted of 3,600 and 5,040 subjects, respectively, comprising both men and women aged between 16 and 65 years.

Sociodemographic, sexual, reproductive characteristics, life and health experiences were the dependent variables; HIV testing, reasons for being tested and counseling were analyzed as outcomes.

For time analysis, double-entry expectancy tables were compiled by gender and main sociodemographic variables: age, skin color, full years of schooling, per capita family income, Brazilian macroregion, marital status, current occupation, current religion, sexual and reproductive practices, age at sexual initiation, condom use at first sexual intercourse, type of sexual partner and number of sexual partners in the last five years prior to the interview, prior sexually transmitted disease (STD), number of children, HIV-related life experiences and health, self-assessment of HIV risk, and belief about mandatory testing. Study variables were defined and categorized as to allow comparability between both 1998 and 2005 surveys.

In the 2005 survey, there were included questions on reasons for being tested or not related to their last testing and whether individual or group counseling was offered before and after testing. Assuming that most Brazilians are not familiar with the term counseling, the following question was asked: "Did you talk about it before your last testing?".

Data were adjusted by weight, primary sampling unit, and strata for complex sample designs (Stata 8.0).[6] Differences between 1998 and 2005 were analyzed using Pearson's chi-square and design-based F test at a 5% significance level.

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.

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[a] Lei nº 5.190, de 20 de junho de 1986. Dispõe sobre a realização de testes para detecção de anticorpos do vírus da Síndrome da Deficiência Imunológica Adquirida (AIDS). Diário Oficial do Estado de São Paulo. 21 jun 1986.
[b] Brasil. Lei nº 7.649, de 25 de janeiro de 1988. Estabelece a obrigatoriedade do cadastramento dos doadores de sangue bem como a realização de exames laboratoriais no sangue coletado, visando a prevenir a propagação de doenças, e dá outras providências. Diário Oficial da União. 27 jan 1988.
[c] Ministério da Saúde. Coordenação Nacional de DST/AIDS. Aconselhamento: um desafio para prática integral em saúde - avaliação das ações. Brasília; 1999.
[d] Jürgens R. Increasing access to HIV testing and counseling while respecting human rights
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http://www.soros.org/initiatives/health/articles_publications/publications/testing_20070907/increasing_20070907.pdf [Cited 2007 Oct 10].
[e] Research conducted by Centro Brasileiro de Análise e Planejamento (Brazilian Center for Analysis and Planning – Cebrap) and Ministry of Health.
[f] Berquó E, coordinator. In: Comportamento sexual da população brasileira e percepções do HIV/AIDS. Brasília (DF): Ministério da Saúde, Secretaria de Políticas de Saúde, Coordenação Nacional DST e Aids; 2000. (Série avaliação, 4).

RESULTS

In 1998 and 2005, 20.2% (95% CI: 16.2;24.3) and 33.6% (95% CI: 31.7;35.4) of all interviewees had been tested for HIV, respectively. However, these rates included blood donor testing. After excluding blood donors, 15.3% and 28.6% of all interviewed had been tested in 1998 and 2005, respectively. When in addition prenatal testing was excluded, access to HIV testing felt to 13.5% and 20.8%, respectively.

Table 1 illustrates changes in HIV testing between 1998 and 2005 among men and women, according to sociodemographic variables.

Among women, both in 1998 and 2005, there were seen lower testing rates at younger and older ages (16–19 and 55–65 years), in the North/Northeast region, and in certain occupations (household maid, liberal professional, retired, student and homemaker). In 2005, significant differences were seen with lower testing among Black women who were illiterate or had elementary schooling, income less than three monthly minimum wages (MMWs), living in the North/Northeast and Central-West/Southeast regions, single, retired, students and followers of Catholic and Protestant religions.

A comparison between 1998 and 2005 data show increased testing rates among women in almost all categories studied, reaching 60% in those aged 25–34. No significant increase was seen in women aged 16–19 years, illiterate, per capita family income between 5–10 MMWs and certain occupations (private sector employees, unemployed and students). The number of female interviewees was small in some categories (liberal professionals, business owners, followers of African-Brazilian religions), which prevented further comparisons.

As for men, both surveys showed lower testing rates at younger and older ages (16–19 and 55–65 years), among those illiterate or who had elementary schooling, and income less than 3 MMWs. Significant testing differences were seen in 2005 with lower rates among those living in the North/Northeast and Central-West/Southeast regions, single, unemployed and students. However, a comparison of testing rates between 1998 and 2005 showed no increase except in those aged 55–65 years, per capita income between 1–3 and 5–10 MMWs, retired, followers of historical Protestantism and African-Brazilian religions, living in the North/Northeast region, and those who reported homosexual practices or not having sexual intercourse in the last five years prior to the interview. Among those more frequently tested, higher rates were found only among those followers of African-Brazilian religions and who reported homosexual practices.

Table 2 shows lifetime testing rates for men and women according to sexual and reproductive variables.

Differences between men and women were identified in both surveys. In 1998, women who had one or no sexual partner sexual during the five years prior to the interview and men who reported homosexual and bisexual partners were less frequently tested.

As for women, in 2005, significant differences were seen in all variables studied. Lower testing rates were found among those who reported sexual initiation between 16 and 23 years of age, no condom use at first intercourse, no sex in the last five years prior to the interview, heterosexual partners, no STDs and no children.

As for men, in 2005, testing was significantly lower among those heterosexual, with no past history of STDs and no children.

A significant increase in testing was seen between 1998 and 2005 among women in almost all categories, except in those who had their sexual initiation before the age of 16 or four or more sexual partners in the last five years prior to the interview. However, among men, a significant increase in testing was seen among those who reported having, during the five years prior to the interview, homosexual or bisexual partners, no sexual intercourse, two to three sexual partners and past history of STD.

When testing was analyzed by life and health experiences (Table 3), there were marked changes between 1998 and 2005 among women, except in those who were self-assessed as high risk for HIV infection. On the other hand, no significant increase in testing rates was seen in any of the variables studied.

Significant differences persisted in 2005, which were identified in 1998 as well, regarding higher testing rates among women and men who were close to an HIV-positive person. Among women, in 1998, those self-assessed as high risk were more frequently tested, while, in 2005, those self-assessed as low or intermediate risk were more often tested.

In 2005, testing was less frequent among women who believed that consent is necessarily required for HIV testing. Men who were self-assessed as low risk were more often tested than those who were self-assessed as intermediate risk or no risk at all.

Reasons for getting tested are displayed in Table 4. There was significant increase of testing during prenatal care among women, and decrease in "work-related reasons," particularly among men.

Significant differences in reasons for testing persisted between men and women in 2005. In both 1998 and 2005, even after excluding those women who reported prenatal care testing, the most common reason was medical indication (44% and 35%, respectively). Among men, the most common reason was blood donation (39% and 36%, respectively).

Among those who had never been tested, 72% reported that they were not likely to be exposed to HIV, 4.7% did not know where they could get tested, 2.5% did not want to think about HIV, 2% said they were afraid to find out they were HIV-positive, and 1.7% claimed to be afraid of needles. Additionally, 30 interviewees (0.7%) said

Table 1. HIV testing according to sociodemographic characteristics. Brazil, 1998 and 2005.

Variable		Women				Men		
		1998		2005		1998		2005
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Age group (years)								
16–19	201	14.0 (5.7;30.4)	227	18.5 (14.0;24.0)***	216	15.6 (4.2;43.6)	233	5.4 (3.1;9.4)***
20–24	212	21.2 (12.3;34.0)	321	45.6 (39.3;52.1)**	211	18.5 (10.8;29.8)	301	22.1 (16.9;28.3)***
25–34	500	19.6 (12.4;29.7)	716	60.3 (55.7;64.8)**	397	40.4 (30.8;50.9)	574	40.9 (36.0;45.9)***
35–44	416	15.1 (8.2;26.4)	616	42.6 (37.6;47.8)**	312	35.0 (23.0;49.3)	532	36.0 (31.2;41.0)***
45–54	274	9.6 (4.7;18.8)	469	25.1 (21.0;30.0)**	201	19.4 (11.1;31.8)	380	30.4 (25.1;36.2)***
55–65	229	1.0 (0.4;2.4)	382	16.1 (12.1;21.0)**	148	7.2 (3.2;15.7)	272	20.8 (15.9;26.7)**
		p<0.05		p<0.00001		p<0.02		p<0.00001
Skin color								
White	875	15.9 (10.8;22.9)	1350	41.7 (38.4;45.0)**	693	30.0 (21.0;40.9)	1127	30.1 (27.4;33.2)***
Black	813	14.1 (8.1;23.3)	1282	35.0 (31.8;38.5)**	713	22.6 (17.9;28.1)	1113	26.7 (23.6;30.2)***
		p<0.6		p<0.003		p<0.16		p<0.15
Schooling								
Illiterate	185	7.8 (2.6;21.4)	160	14.0 (8.8;21.5)***	116	10.8 (5.0;22.1)	113	10.0 (4.9;19.1)***
Elementary	978	14.8 (8.0;25.9)	1212	33.1 (30.0;36.5)**	875	21.0 (15.7;27.5)	1027	21.7 (19.1;24.6)***
Middle	494	16.7 (11.7;23.2)	876	43.2 (39.4;47.0)***	356	33.5 (24.1;44.4)	801	31.3 (27.8;35.0)***
University	175	15.2 (10.2;21.9)	443	50.1 (44.6;55.6)***	138	48.0 (32.3;64.0)	321	48.1 (41.4;55.0)***
		p<0.59		p<0.0001		p<0.001		p<0.0001
Family income (monthly minimum wages)								
Up to 1	209	2.9 (1.5;5.5)	450	31.6 (26.7;36.9)**	114	10.2 (4.8;20.5)	236	8.3 (5.2;13.1)***
More than 1 to 3	427	13.0 (7.1;22.6)	1048	33.8 (30.3;37.5)**	350	8.7 (5.5;13.5)	844	21.8 (18.8;25.1)**
More than 3 to 5	301	12.9 (7.1;22.2)	506	42.4 (37.4;47.5)**	293	29.7 (20.4;41.0)	501	31.2 (26.7;36.1)***
More than 5 to 10	288	27.4 (12.3;50.5)	377	43.5 (37.6;49.6)***	309	23.6 (15.1;34.8)	394	38.6 (33.1;44.4)*
More than 10	255	13.7 (7.4;24.0)	209	48.1 (40.6;55.7)**	232	30.8 (21.7;41.6)	213	36.9 (30.1;44.3)***
Do not know/ Unknown	352	12.0 (6.9;20.0)	141	39.0 (31.2;47.5)**	187	41.7 (25.2;60.3)	104	35.7 (25.1;54.5)*
		p<0.075****		p<0.0002****		p<0.002****		p<0.00001****
Brazilian region								
North/Northeast	611	4.4 (2.4;7.9)	701	27.1 (23.3;31.3)**	493	15.6 (11.9;20.3)	557	22.1 (18.4;26.4)*
Central-West/ Southeast	768	13.7 (9.3;19.9)	680	37.8 (32.6;43.2)**	612	28.8 (17.8;43.1)	579	27.2 (23.4;31.4)***
State of São Paulo	188	24.6 (11.6;44.7)	665	45.7 (41.1;50.3)*	133	29.8 (20.2;41.6)	586	33.6 (29.6;37.9)***
South	265	18.7 (12.0;28)	685	44.5 (40.4;48.7)**	247	31.9 (21.0;45.1)	570	32.0 (27.5;36.8)***
		p<0.013		p<0.00001		p<0.13		p<0.0001
Marital status								
Single	512	13.9 (8.4;21.9)	722	29.5 (25.6;33.7)**	549	21.6 (13.2;33.3)	831	23.5 (20.2;27.1)***
Married/living with a partner	999	15.6 (10.0;23.4)	1544	42.6 (39.7;45.6)**	862	29.2 (23.6;35.6)	1307	31.6 (28.7;34.7)***
Separated/divorced Widowed	186	22.5 (13.0;36.1)	315	45.3 (38.0;52.8)**	58	29.0 (12.8;53.3)	129	36.2 (26.1;47.8)***
Do not know/ unknown	135	6.0 (1.6;20.1)	150	22.2 (15.5;30.9)*	16	9.6 (1.3;45.5)	25	17.8 (5.7;43.4)***

To be continued

Continuation Table 1

Variable	Women				Men			
	1998		2005		1998		2005	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Current occupation								
Private employee	200	30.0 (17.0;47.3)	509	46.6 (41.4;51.9)***	437	30.5 (23.3;38.9)	848	31.8 (28.0;35.9)***
Public employee	199	14.9 (7.4;27.9)	203	49.2 (40.8;57.7)**	132	47.5 (34.1;61.2)	171	56.6 (47.3;65.5)***
Self-employed	178	14.7 (5.5;33.5)	330	43.6 (37.7;49.8)**	412	21.0 (12.6;33.0)	577	24.5 (20.6;28.8)***
Household maid	128	7.5 (3.2;16.7)	191	24.7 (18.5;32.3)*	4	0 (0)	3	60.9 (11.6;94.9)
Liberal professional	12	7.5 (1.4;31.4)	45	35.3 (21.7;51.8)***	24	18.3 (6.4;42.2)	57	30.5 (20.5;43.1)***
Business owner	71	15.7 (4.4;43.0)	64	37.2 (26.0;49.9)***	86	35.4 (16.2;60.9)	81	27.6 (17.8;40.1)***
Unemployed	97	28.1 (12.5;51.7)	218	48.4 (40.7;56.0)***	170	30.1 (17.3;46.9)	212	22.4 (16.5;29.5)***
Retired	163	5.3 (1.8;14.4)	217	22.8 (16.7;30.2)**	107	11.2 (4.4;25.8)	165	24.6 (17.8;32.9)*
Student	136	10.2 (4.4;21.9)	164	19.4 (13.5;27.0)***	111	17.5 (5.6;42.8)	137	10.4 (6.2;16.8)***
Menaker	638	10.8 (6.7;16.9)	745	36.0 (31.9;40.2)**	0	-	0	-
Other	10	1.5 (0.2;12.3)	44	41.3 (25.7;58.8)***	2	31.4 (2.7;88.1)	41	28.2 (15.1;46.4)***
		p<0.015		p<0.0001		p<0.072		p<0.00001
Current religion								
Catholic	1316	14.7 (9.5;21.9)	1718	35.5 (32.7;38.5)**	1105	27.8 (21.1;35.8)	1531	28.4 (25.6;31.4)***
Historical Protestant	81	6.5 (1.6;22.5)	224	39.3 (32.2;46.8)**	81	13.0 (5.8;26.8)	167	28.1 (20.9;36.6)*
Pentecostal	228	17.6 (8.8;32.0)	439	38.6 (33.7;43.8)**	111	15.0 (6.7;30.2)	231	24.0(18.2;30.9)***
Spiritist	59	16.3 (6.5;35.2)	116	53.2 (41.9;64.1)**	33	46.2 (19.3;75.5)	63	43.0 (29.8;57.3)***
African-Brazilian	6	1.4 (0.1;12.2)	18	51.9 (25.5;77.3)***	7	6.4 (0.8;37.7)	9	68.9 (28.9;92.3)*
None	86	8.1 (2.5;23.1)	168	49.7 (40.7;58.6)**	119	29.4 (15.2;49.4)	254	29.1 (22.7;36.4)***
Other	54	23.9 (6.5;58.4)	44	43.0 (27.6;60.0)	25	18.7 (4.3;53.7)	35	23.7 (11.6;42.4)***
		p<0.56		p<0.004		p<0.21		p<0.11
Total	1832	14.8 (10.3;20.9)	2731	38.2 (35.7;40.7)	1485	26.2 (20.6;32.6)	2292	28.4 (26.3;30.7)

Differences between 1998 and 2005:
* p <0.05
** p<0.01
*** p=NS
**** Do not know or missing information were excluded from analysis.

they believed the results would not be kept confidential, 18 claimed to be afraid of losing their jobs, insurance, house, family and friends, and five out of a total of 5,040 said they were afraid their names would be reported to the authorities in case of positive results.

In 2005, more than half of men and women did not get any advice before or after testing. Of those who did receive it, advice was given in an individual session. Between 1% and 2.5% did not know they were being tested.

DISCUSSION

The comparison between cross-sectional studies with similar methodological approaches allows to identifying changes in in-between years and to distinguish particular generational, social, regional, ethnic/racial and gender inequalities in HIV testing.[7]

The proportion of those ever tested significantly increase between 1998 and 2005 (from 20% to 33.6%), meaning that almost 27 million, or after excluding blood donors, 22.7 million people (28.6%)[6] had ever been tested in urban Brazil in 2005.

A 1991 study conducted by Datafolha Research Institute in seven Brazilian capitals (São Paulo, Rio de Janeiro, Belo Horizonte, Porto Alegre, Curitiba, Salvador and Recife) showed overall coverage of 14%;[a] an approximately 100% increase between 1991 and 2005. The same trend was verified in a comparison with a study by Perseu Abramo Foundation[b] (2001) in a representative sample of Brazilian women over 15 years of age:

[a] Datafolha. Relatório de pesquisa de opinião número 1055. São Paulo; 1991.
[b] Fundação Perseu Abramo. Núcleo de Opinião Pública. A mulher brasileira nos espaços público e privado [internet]. São Paulo; 2001. Available from: http://www.fpabramo.org.br/nop/mulheres/download.htm [Cited 2003 Oct 12].

Table 2. HIV testing according to sexual and reproductive characteristics. Brazil, 1998 and 2005.

	Women				Men			
Variable	1998		2005		1998		2005	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Sexually active								
Yes	1638	16.3 (11.3;22.9)	2555	41.3 (38.7;44.0)**	1402	27.8 (22.2;34.2)	2188	30.1 (27.8;32.5)***
Never	194	2.7 (0.4;14.9)	168	3.4 (1.5;7.5)	83	0 (0)	102	3.1 (1.0;9.3)
Age at sexual initiation (years)								
Less than 15	132	27.1 (10.5;54.1)	270	51.8 (43.8;59.7)***	377	29.5 (20.0;41.1)	649	29.6(25.7;33.7)***
15 to 23	1286	15.7 (10.9;22.0)	1980	40.7 (37.8;43.7)**	982	26.1 (19.6;33.9)	1440	30.9 (28.0;34.0)***
24 or more	218	12.2 (5.3;25.6)	263	37.2 (29.6;45.4)**	221	57.5 (38.1;74.8)	543	21.3 (11.1;37.0)***
		p<0.29		p<0.02		p<0.14		p<0.41
Condom use at sexual initiation								
Yes	221	17.9 (7.2;37.8)	543	49.7 (44.7;54.7)**	240	35.6 (21.4;52.8)	504	27.2 (22.9;31.8)***
No	1417	15.9 (11.8;21.1)	1989	38.6 (35.8;41.5)**	1162	26.1 (21.3;31.5)	1673	31.1 (28.4;33.9)***
		p<0.66		p<0.0002		p<0.19		p<0.15
Sexual partners in the last five years								
Heterossexual	1418	16.9 (11.2;24.7)	2482	39.2 (36.7;41.8)**	1312	28.0 (22.1;34.9)	2197	27.7 (25.6;30.0)***
Homossexual/ bisexual	21	44.5 (10.3;84.8)	19	72.7 (47.2;88.8)*	23	8.6 (2.5;25.6)	45	58.5 (41.8;73.4)**
No partners	392	4.9 (2.1;10.9)	230	21.2 (15.3;28.6)**	149	12.5 (4.0;33.2)	50	34.1 (18.9;53.6)*
Missing information	1	0 (0)	0	-	1	100 (0)	0	-
		p<0.17****		p<0.00001		p<0.026****		p<0.0006
Number of sexual partners (last 5 years)								
None	190	5.6 (1.9;15.2)	231	21.7 (15.8;29.2)**	31	45.4 (13.7;81.3)	50	34.1 (18.9;53.6)***
One	1136	12.5 (8.3;18.4)	1847	40.0 (37.1;43.0)**	606	29.3 (22.6;36.9)	1091	29.1 (26.2;32.2)***
Two to three	155	29.3 (15.5;48.2)	245	55.2 (47.4;62.7)*	154	20.9 (12.7;32.5)	219	37.5 (30.3;45.3)*
Four to five	123	36.6 (16.0;63.8)	166	52.7 (43.4;61.8)***	274	32.2 (18.4;50.1)	397	28.4 (23.2;34.3)***
More than 6	26	61.1 (29.3;85.6)	43	65.0 (48.1;78.8)***	301	24.0 (16.7;33.2)	386	31.2 (26.0;37.1)***
Do not know	3	9.6 (0.9;56.0)	4	18.7 (1.2;72.3)***	29	27.4 (6.3;68.0)	26	13.4 (4.9;31.7)***
Missing information	5	41.5 (5.5;89.7)	18	39.5 (18.3;65.6)***	7	0	19	33.7 (11.5;66.5)
		p<0.0002****		p<0.0001		p<0.62****		p<0.35
Ever had STD?								
Yes	109	8.8 (3.9;18.7)	439	47.8 (42.2;53.5)**	307	24.3 (16.7;34.0)	413	35.8 (29.8;42.3)*
No	1700	15.4 (10.6;21.9)	2166	37.9 (35.2;40.7)**	1166	26.6 (20.6;34.0)	1773	27.3 (25.0;29.6)***
Do not know	4	0	12	27.3 (7.4;63.6)	4	0	5	54.4 (15.2;88.8)
Missing information	19	0	2	45.2 (4.9;93.0)	8	0	0	–
		p<0.19****		p<0.003		p<0.67****		p<0.008
Children?								
Yes	1345	15.1 (9.1;23.8)	2070	42.9 (40.0;45.8)**	886	29.0 (23.9;34.8)	1397	31.8 (29.0;34.8)***
No	483	12.2 (7.2;20.0)	661	25.2 (21.4;29.5)**	598	22.6 (13.4;35.5)	889	23.9 (20.6;27.5)***
Do not know/ missing information	5	96.4 (71.3;99.7)	3	-	5	0	6	7.2 (1.3;30.9)
		p<0.57****		p<0.0001		p<0.32****		p<0.001****
Total	1832	14.8 (10.3;20.9)	2731	38.2 (35.7;40.7)	1485	26.2 (20.6;32.6)	2292	28.4 (26.3;30.7)

Differences between 1998 and 2005
* p<0.05
** p<0.01
*** p=NS
**** Do not know or missing information were excluded from analysis

Table 3. HIV testing according to perceptions and life experiences and health. Brazil, 1998 and 2005

Variable	Women				Men			
	1998		2005		1998		2005	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Close to an HIV-positive person								
Yes	405	24.9 (13.2;41.9)	1258	47.8 (44.5;51.1)**	229	42.5 (30.8;55.1)	979	39.1 (35.8;42.5)***
No	1418	10.8 (7.4;15.5)	1472	30.2 (27.0;33.2)**	1253	22.4 (16.4;29.8)	1309	20.4 (17.9;23.1)***
Do not know	7	45.4 (10.9;84.9)	1	100 (-)	3	0	3	100 (-)
Missing information	2	0	0	-	0	-	1	0
		p<0.02****		p<0.00001****		p<0.003****		p<0.00001****
Self-assessed risk of HIV infection								
None	827	11.8 (7.0;19.1)	1785	33.3 (30.5;36.2)**	703	26.8 (21.1;33.4)	1519	26.4 (23.8;29.1)***
Low	647	16.3 (9.7;26.0)	621	50.4 (45.7;55.2)**	537	28.0 (18.9;39.4)	542	36.1 (31.7;40.6)***
Intermediate	211	13.4 (6.9;24.2)	211	41.5 (34.3;49.0)**	147	24.2 (12.4;41.7)	146	23.3 (16.3;32.2)***
High	69	54.5 (30.4;76.6)	70	37.3 (25.6;50.8)***	60	18.9 (7.5;40.1)	70	28.0 (17.6;41.4)***
Do not know	75	2.2 (0.6;7.9)	42	45.3 (28.4;63.3)**	37	10.2 (1.7;42.4)	13	20.9 (6.6;49.4)***
Missing information	3	0	2	51.5 (6.1;94.6)	1	0	2	38.8 (3.8;91.1)
		p<0.0007****		p<0.00001****		p<0.78****		p<0.0017****
For testing, the testee must consent								
Yes	1240	15.3 (10.4;22.0)	1946	36.2 (33.5;39.1)**	1016	23.8 (16.8;32.6)	1735	28.2 (25.7;30.9)***
No	541	14.6 (9.2;22.3)	734	43.7 (39.7;47.9)**	412	33.9 (24.5;44.8)	522	30.1 (25.7;34.8)***
Do not know	49	0	51	31.9 (20.1;46.5)	56	15.7 (6.5;33.2)	34	14.4 (6.1;30.2)***
Missing information	2	0	0	-	1	0	1	100
		p<0.80****		p<0.0014****		p<0.14****		p<0.50****
Total	1832	14.8 (10.3;20.9)	2731	38.2 (35.7;40.7)	1485	26.2 (20.6;32.6)	2292	28.4 (26.3;30.7)

Differences between 1998 and 2005
* p <0.05
** p<0.01
*** p=NS
**** Do not know or missing information were excluded from analysis.

25% of non-virgin women (88%) reported ever being tested, projecting a coverage of at least 22% compared to 38.2% in 2005. There is thus evidence of increasing testing rates in Brazil.

Current testing rates are similar to those reported in the US (34%)[16] and Switzerland (40%)[25,33] in 1997–1998 and Canada (34.9%) in 1995–1996.[15] However, these studies excluded blood donation testing and, after excluding blood donors, testing rates in Brazil in 2005 are significantly lower.

In the US, the Centers for Disease Control and Prevention (CDC) have, since 1973, periodically collected data on health and, since 1995, on HIV testing through the National Survey of Family Growth. These surveys show increasing testing rates among American women, from 34.5% in 1995 to 54.9% in 2002 (excluding blood donations).[3] In Italy, there was found a testing rate of 39.3% among people from four different provinces in 2002. Quota sampling (with 40% refusal rate) and different collection approaches do not allow to inferring an increase in testing rates in Italy between 1998 and 2002.[29]

Testing rates in Brazil seems higher than in Greece (10.1%), Italy (15.5%), and Norway (17.4%) in 1997–1998.[25] According to Jeannin et al[17] (1998), European countries had coverage between 9% (Holland) and 30% (West Germany) in the 1990s.

Yet HIV testing scaling up between 1998 and 2005 was seen mostly among women at childbearing age for reduction of HIV vertical transmission. In fact, 27.2% of women prenatal care as a reason for testing in 1998; 46% reported that in 2005. For the first time, in 2005, testing coverage in Brazil among women was higher than that among men.[a,b]

a Datafolha. Relatório de pesquisa de opinião número 1055, 9 de dezembro de 1991. São Paulo; 1991.
b Fundação Perseu Abramo. Núcleo de Opinião Pública. A mulher brasileira nos espaços público e privado [internet]. São Paulo; 2001. Disponível em: http://www.fpabramo.org.br/nop/mulheres/download.htm [Cited 2003 out 12].

Table 4. Reasons for last HIV testing reported by urban Brazilians men and women aged 16 to 65 according to survey year. Brazil, 1998 and 2005

	HIV testing				
Reason for being tested	1998		2005		p<
	n (%)		n (%)		
One's own initiative	161* (26)		502 (28)		
Medical indication	92 (19)		307 (17)		
Blood donor	165 (29)		345 (21)		
Prenatal care	40 (10)		514 (27)		
Work-related	49 (11)		105 (5.5)		
Other	19 (5)		29 (1.4)		0.0001
	Men	Women	Men	Women	
One's own initiative	86* (29)	75 (22)	259 (37)	243 (21)	
Medical indication	32 (10)	60 (33)	106 (15)	201 (19)	
Blood donor	135 (40)	30 (12)	238 (36)	107 (10)	
Prenatal care	0 (0)	40 (25)	4 (0.3)	510 (46)	
Work-related	35 (15)	14 (4)	73 (10)	32 (2)	0.0001
Other	13 (6)	6 (3)	12 (1)	17 (1.5)	

* Fifteen interviewees gave more than one reason besides their own initiative.

This selective scaling up is consistent with the historical medicalization of the female body while the male body has not systematically been an object of intervention in Brazilian health settings. The example of the Women's Comprehensive Health Care Program (PAISM) is illustrative. Established in 1980s, this program has privileged women as a sexual/reproductive being.[9] In Brazil, HIV testing has been linked to between prenatal care with routine testing of all pregnant women with no consent required or adequate advice offered, leading to an increase in testing rates to 60% among women aged between 25 and 34 years.

In the US, compared to 1998,[16] women were more often tested than men in 2002.[2] In Italy, HIV testing is less common among women, while in Greece and Norway there are no gender-related differences.[26]

There is evidence that a reduction of vertical transmission comes after a policy of screening and treatment of HIV-positive pregnant women.[5] However, for achieving vertical transmission reduction ethical principles concerning pregnant women's absolute choice on testing must not be disregarded.

In the present study, 55% of interviewees did not get any counseling and 1.6% were unaware they were being tested. In other words, 26.7 out of 79.5 millions who were ever tested, more than 14.7 millions were tested unadvised and more than 420,000 were unaware they were being tested.

Goldani et al[13] (2003) claim that testing pregnant women has represented rather a mandatory than voluntary strategy. They studied 1,658 pregnant women of three public maternity hospitals in Porto Alegre (RS)

and found 59.2% had not received any prior counseling, 18.1% were unaware they were being tested and 3.2% believed testing was mandatory. Morimura et al[19] (2006), while studying pregnant women in a school maternity hospital in Recife, also reported no pre-testing counseling (52% during prenatal care and 90% in rapid testing in the maternity hospital), and difficulty to receive test results as well. Segurado et al[28] (2003) interviewed women living with HIV/AIDS in reference services in São Paulo. They found 42% received pre-testing and 62.5% post-testing counseling. These studies indicate that testing has been performed during pregnancy care and other care settings without women's consent, either they were HIV-positive or not, and without offering any counseling. An US study demonstrated that HIV testing was recommended based on the provider's perception of pregnant women's risk behaviors, suggesting judgmental decision making.[4]

Testing rates seems to be increasing in Brazil without showing proper concern to people's right to autonomous decision and without offering wider and quality counseling. Being tested can be part of what Paiva et al[21] defined as "the right to prevention": promotion of access to prevention materials (condoms, syringes), information, education and quality counseling even when the interface with care is greater as having access to quality STD treatment, sexual and reproductive health care or prevention of transmission vertical.

As for HIV testing, not all health-related difference means inequality. Health inequality means unequal differences that "besides being systematic and significant, they are preventable, unfair and unnecessary as well".[7]

Table 5. Counseling characteristics of HIV testing reported by urban Brazilians men and women aged 16 to 65. Brazil, 2005

Variable	n (%)	Men n (%)	Women n (%)
Talked about it before the last testing?			
Yes, individual session	641 (35.2)	230 (33.6)	411 (36.4)
Yes, group session	123 (6.7)	46 (7.1)	77 (6.5)
Did not receive advice	995 (55.4)	394 (55.6)	601 (55.2)
Did not know she/he was being tested	29 (1.6)	17 (2.5)	12 (1.0)
Do not know	13 (0.8)	5 (0.9)	8 (0.8)
Refusal	3 (0.2)	1 (0.3)	2 (0.2)
Total	1804	693	1111
Talked about it after the last testing?			
Yes, individual session	624 (35.2)	193 (29.7)	431 (39.0)
Yes, group session	90 (4.9)	31 (5.3)	59 (4.7)
Did not receive advice	1018 (55.5)	438 (60.3)	580 (52.3)
Did not know she/he was being tested	26 (1.4)	13 (1.8)	13 (1.2)
Did not get the results	29 (1.6)	13 (1.7)	16 (1.5)
Do not know	16 (1.3)	5 (1.3)	8 (1.2)
Refusal	1 (0.05)	0 (0)	1 (0.08)
Total	1804	693	1111

Lower testing rates can be associated to reduced likelihood of early identifying certain population groups with prevention and treatment needs. The present study documents that young men and women aged between 16 and 19 have been less frequently tested, consistently shown in 1998 and 2005, without any significant changes in in-between years. These differences may be unequal by systematically affecting less economically favored social groups.

Similarly, testing rates were lower in those aged 16–19 years in the US (12.2% in 1998,[16] and 18.7% in 2002[3]), Canada (18%, 1995–1996[15]), Italy (4.9% of men; 6.3% of women[26]) and in other European countries.[25]

The literature confirms that young people may resist HIV testing if they find health services unfriendly.[18,20] African studies have reported that services friendly to young people are those that assure confidentiality, and provide well-trained and non-stigmatizing counselors, different strategies for the integration between family and social networks and young populations.[a,b] In the US, although young people credit being tested due to provider's recommendation, less than half of health providers do that, disregarding the American Academy of Pediatrics recommendations.[4] Low testing rates among those aged 16 to 19 may suggest that prevention actions targeting this population are basically limited to information and male condom distribution at schools.[21]

Another population segment that did not show any progress in testing was illiterate men and women. This finding corroborates other studies in Greece, Italy, Switzerland and Norway that showed lower testing rates among low schooling people,[25] as well US studies.[16] Illiterate people's health status suffer from major disadvantages in Brazil.[1]

Men and women with less than three per capita MMWs still had the lowest testing rates in 2005. Considering data on illiteracy and low income, it can be said that there persists socioeconomic inequalities in access to testing.

Despite higher testing rates in the North/Northeast regions, there were still regional inequalities in 2005. Compared to White, Black women were less often tested for HIV, which corroborates the Ministry of Health's study findings.[a]

Other major results of the present study were testing stabilization among private sector employees, business owners, unemployed and students, as well among those who reported sexual initiation before the age of 15. The literature did not have any other studies on HIV testing in these subpopulations.

Women who reported sexual initiation before the age of 15 were more frequently tested. The literature has established an association between age at sexual initiation and HIV infection.[14,23] In Brazil, D'Oliveira et al[b]

[a] França-Junior,I , Lopes, F, Paiva, V, Venturi, G Acesso ao teste anti-HIV no Brasil 2003: a pesquisa MS/IBOPE [internet]. Brasília: Ministério da Saúde; 2003. Available from: http://www.aids.gov.br/main.asp?ViewID=%7BA62BDF6E%2D914A%2D4DF7%2DA10E%2DCE06AB4E26F7%7D&params=itemID=%7BAEAB8D56%2D0731%2D4276%2DA8B2%2DB7C2729EE8BB%7D;&UIPartUID=%7B585687B3%2DF650%2D459E%2DAC6E%2D23C0B92FB5C4%7D [Cited 2008 April 01].
[b] Pesquisa sobre fatores associados à violência por parceiros íntimos em mulheres em duas regiões do Brasil, por d'Oliveira AFL, Schraiber LB, França-Junior I, Ludermir AB, Portella AP, Diniz CSG (unpublished data).

described that one out of three women in the city of São Paulo, Southeast region, and Zona da Mata area in Pernambuco, Northeast region, reported forced sexual initiation before the age of 15. Forced early sexual initiation can increase the incidence of HIV infection and make more women seek testing.

Between 1998 and 2005, there was no increase in testing rates among women who reported four or more sexual partners in the five years prior to interview or who were self-assessed as high risk for HIV infection. This trend requires attention since these groups are more likely to get HIV infection.[4]

De Cock et al[10] (2006) stated that for equitably scaling up HIV testing innovative approaches are required including offering new methods, such as saliva or fingertip testing, as well as actions for testing entire families at health facilities, at home or in community settings. However, these strategies can be effective only along with strategies for fighting stigma associated to HIV.

In fact, Brazilian population segments (illiterate and poor men) excluded from HIV testing scale-up are showing persistent increase in AIDS incidence since 1999.[11,27]

Socioeconomic, generational, regional, ethnic/racial inequalities in testing are consistent with difficulties faced by other countries such as Italy, Canada and the US.[15,16,25,26]

In the present study, non-voluntary (blood donation and work-related) testing rates decreased in 2005, especially among men, while prenatal care testing increased in settings suggesting non-voluntary testing without counseling. In 1998, 80% of urban Brazilian population believed HIV testing should be mandatory to everyone regardless of their HIV vulnerability.[a] There can be seen in this scenario the introduction of effective practices for mandatory testing without counseling among women during prenatal and delivery care for prevention of vertical transmission.[13,19,28] This is a contradictory approach for scaling up coverage as it does not safeguard women's right to autonomy and body integrity. Increased coverage and mandatory testing are relevant issues that should be discussed along with the role of counseling. The CDC[4] and WHO/UNAIDS[32] recommendations on HIV testing and counseling in health settings share a common proposal of scaling up testing promoted by health providers.

Despite the consensus, issues related to scaling up testing offered by health providers and routine testing should be discussed. These situations may involve testing without consent and produce arguments between

human rights advocates and public health authorities on the actual need, and to what extent, the principles of counseling, consent and confidentiality[30] should be compromised. It is necessary to identify specific population and epidemic scenarios to find a balance between scaling up testing and voluntary counseling, particularly among more HIV vulnerable populations, and scaling up testing by health professionals.

Since 1997, counseling has been referred to as an intervention/technology to be more widely introduced in different health settings available in healthcare network.[b]

A potential limitation of the present study was an increase in sample representation of urban population. Comparing 1998 and 2005 data, based on IBGE's 2000 Census, both study samples included 90.2% of the same urban population.[6] The increased number of census tracts and the inclusion of tracts with more than 100,000 inhabitants in the 2005 sample has broaden its representativeness (from 77.7 to 87.7% of urban population) without losing its comparability to the previous survey. Refusal rate was relatively low and declined: 11.5% in 1998 and 7.5% in 2005.[6,a] Therefore, in both surveys, the study comprised representative and comparable samples of urban Brazilian population.

It is not expected that increased representativeness of 2005 sample would have an impact on the estimated testing scaling up compared to 1998. There are no empirical data to support that those people living in urban areas with 100,000 to 200,000 inhabitants have different testing behaviors that would explain increased testing among women and stabilization among men.

In the 2005 survey, a higher number of individuals were sampled. However, some populations remained in small numbers and showed wide confidence intervals (CIs) such as women and men in certain occupations (public sector employees, unemployed, students, liberal professionals and business owners); followers of spiritism and African-Brazilian religions; those having homosexual or bisexual partners or who were self-assessed as high risk for HIV infection. Widowed men and women with more than six sexual partners still showed wide CIs. Further survey studies should include larger samples, similar to international designs on sexuality and risk perception including samples of more than 10,000 interviewees.

In the analysis of testing during lifetime, it should be taken into consideration the likelihood of inconsistent answers due to respondents' inaccuracies or forgetfulness, even regarding testing in the year prior to the interview. In the US, an analysis of national surveys identified different reporting by the same individual regarding being tested in a year time.[24] However, this

[a] Berquó E, coordinator. In: Comportamento sexual da população brasileira e percepções do HIV/AIDS. Brasília (DF): Ministério da Saúde, Secretaria de Políticas de Saúde, Coordenação Nacional DST e Aids; 2000. (Série avaliação, 4).
[b] Ministério da Saúde. Programa Nacional de controle de DST/AIDS. Aconselhamento em DST, HIV e AIDS - Diretrizes e procedimentos básicos. Brasília; 1997.

study did not manage to measure the direction of bias (under or overestimation) besides the fact that it was conducted between 1990 and 1992 before HAART introduction.

Population-based studies, on the other hand, may underestimate response rates of sensitive questions that may stir up stigma and discrimination. The Brazilian Institute of Public Opinion and Statistics (IBOPE) was responsible for data collection in the 2005 survey and sought to apply potentially mitigating procedures, e.g., interviewees were interviewed by same-sex interviewers. Also, to prevent underestimation, it was explicitly explained to interviewers and interviewees that test results would not be asked during data collection.

To strengthen testing as a preventive strategy, there is a need to increase offer along with counseling. This combination has the potential of breaking off the HIV transmission chain as it allows people to know their HIV status and ponder on infection risks and prevention through behavioral changes.[a,b] It is estimated that new infections could be reduced by 30% a year if all infected people would know their HIV status.[4]

Campaigns such as "Fique Sabendo"[c] (Did you know?) are opportune but should focus on those segments that have been systematically excluded and be implemented to assure the rights of those being tested. Future awareness campaigns need to reinforce that HIV testing should always be voluntary, confidential and offered along with high-quality counseling. Access to such testing is a citizen's right and a provider's duty in both public and private settings. Referral and counter-referral mechanisms should also be established, notably where they are deficient: blood banks, private laboratories, basic health units, among others.

[a] Ministério da Saúde. Programa Nacional de controle de DST/AIDS. Aconselhamento em DST, HIV e AIDS - Diretrizes e procedimentos básicos. Brasília; 1997.
[b] Ministério da Saúde. Diretrizes dos Centros de Testagem e Aconselhamento (CTA) – Manual. Brasília; 1999.
[c] Ministério da Saúde. Coordenação Nacional de DST e AIDS. Fique Sabendo [homepage in the internet]. Brasília; 2003. Available from: http://www.aids.gov.br/fiquesabendo/ [Cited 2003 Jun 20].

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