

## Risky sexual practices among men who have sex with men in Northeast Brazil: results from four sequential surveys

Práticas sexuais de risco de homens que fazem sexo com homens no Nordeste do Brasil: resultados de quatro inquéritos seqüenciais

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### Abstract

*This paper focuses on recent trends in risky sexual practices for HIV/AIDS among men who have sex with men (MSM) in Fortaleza, Ceará State, Brazil. Four cross-sectional surveys were conducted (1995, 1998, 2002, and 2005) among MSM 14 years or older who reported oral or anal sex in the previous 12 months. Sexual practices were considered risky whenever the respondent reported unprotected receptive or insertive anal intercourse in the six months preceding the interview. Different selection techniques were used to recruit the study population: snowball (1995, 1998, 2002 – 32%); time-space sampling (2002 – 68%); and respondent-driven sampling (2005). Analyses were based on the comparison between proportions. High rates of risky sexual practices were reported in 1995 (49.9%), decreasing in 1998 (32.6%), increasing again in 2002 (51.3%), and showing the lowest level in 2005 (31.4%). Participants with more schooling increased their risky practices from 1998 to 2002, decreasing in 2005. Among individuals with medium or low schooling, risky behavior declined from 2002 to 2005. The article highlights the need for behavioral surveillance to properly address STD/HIV prevention.*

*Sexual Behavior; Unsafe Sex; Male Homosexuality*

### Introduction

In Brazil, AIDS cases among men who have sex with men (MSM) predominated as a proportion of the total number of reported cases for many years. However, the early 1990s witnessed a relative decrease in this category along with a proportional increase of cases in heterosexuals <sup>1,2,3</sup>. In the Northeast Region, AIDS cases among men who have sex with men still represent a considerably high proportion, with some 50% of all cases reported in recent years <sup>4</sup>.

It is essential to study the variation in sexual behavior among MSM over time and in relation to their attitudes and practices, as well as to determine the associated factors, in order to draft more adequate preventive strategies <sup>5,6</sup>.

Cross-sectional studies on sexual behavior have been recommended to monitor populations at increased risk of HIV infection <sup>5,7</sup>. This process consists of the systematic repetition of cross-sectional studies or behavioral surveillance surveys (BSS) <sup>8</sup> capable of analyzing behaviors, knowledge, and attitudes related to HIV/AIDS and other sexually transmitted diseases (STDs) <sup>5,9,10</sup>. The main purpose of these studies is to detect the behavior changes in the most vulnerable population groups that can have the greatest impact on the AIDS epidemic. Such studies can also be useful to detect behavioral time trends in regions exposed to prevention work, thus serving as an important compo-

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ment for evaluating and monitoring such activities<sup>6,7,11,12</sup>.

Monitoring behavior through cross-sectional studies is considered essential for the epidemiological surveillance of HIV/AIDS and other STDs<sup>5,7,13</sup>. Such surveys can be used for evaluation, in combination with qualitative methodologies, especially in a triangulation process, and in the choice of sentinel groups based on epidemiological, political, and cultural aspects. A two-year interval is recommended between the survey waves in order to detect behavioral trends that provide the basis for adjustments in prevention programs<sup>5,8,10,14</sup>. Different methodologies have been used to monitor hard-to-reach populations, including the snowball technique, time-space sampling, and more recently respondent-driven sampling.

Snowball sampling is a non-probabilistic selection procedure in which an initial group of members of the target population identifies other potential participants, and so on successively<sup>15,16</sup>. Despite the gain in efficiency in the identification and inclusion of members of hard-to-reach populations, the procedure frequently falls short of a representative sample of the target population, due to the tendency of individuals to name persons with similar social, demographic, and behavioral characteristics. Time-space sampling (TSS) seeks to emulate a probabilistic sample by mapping the universe of sites where a large number of members of the target population can be found. Random samples of days, times, and recruiting sites are conducted, and potential participants are systematically selected at these sites<sup>17,18,19</sup>. However, TSS only includes populations that normally frequent the selected sites. A method that was developed more recently, called respondent-driven sampling (RDS), offers more statistical rigor in relation to the snowball selection process, through the use of longer recruiting chains, limits to recruitment, and collection of data that can be used to adjust for possible biases inherent to the process by which individuals with similar characteristics form contact networks and are more prone to recruit each other<sup>20,21</sup>. However, despite increasing use in surveys to identify hard-to-reach populations, as a methodology RDS is still under development, and some statistical issues remain to be clarified<sup>22</sup>.

The aim of the current study is to analyze the behavior of MSM in different time periods in the municipality of Fortaleza, in order to support possible changes in AIDS prevention strategies in this specific population in the State of Ceará, Brazil.

## Material and methods

### Study type and site

Four cross-sectional surveys were conducted in the municipality of Fortaleza, capital of the State of Ceará in Northeast Brazil. Fortaleza is one of the country's five largest cities (Instituto Brasileiro de Geografia e Estatística; <http://www.ibge.gov.br>), characterized by major social inequality, and with tourism as one of its main sources of income.

### Study population

The study population consisted of MSM, 14 years or older, living in Fortaleza, who reported having practiced oral or anal sex with men in the previous 12 months.

In 1995, 400 men were recruited, 65% of whom through the snowball technique<sup>15,23</sup>; 15% in public places; 9% in bars or nightclubs; and 11% in other places such as movie theaters, saunas, beaches, workplaces, and nongovernmental organizations (NGOs). In 1998, 100% of the 200 participants were recruited with the snowball technique. In 2002, the sample of 401 men was based on two sampling techniques: snowball (32% of participants) and TSS (68%)<sup>12,17,18</sup>. In 2005, 406 men were recruited using RDS<sup>20,24</sup>. Each year the recruitment sites were mapped with the help of NGOs that work in AIDS prevention in the MSM population or leaders of the gay community.

### Data collection and study variables

A semi-structured KAP questionnaire (knowledge, attitudes, and practices) was applied, seeking comparability with standard questions recommended for this type of population and that had already been used in previous surveys in this State, in other studies by the Ministry of Health, and in international studies<sup>5,7</sup>.

Interviews were conducted by previously trained interviewers, selected among MSM who assumed their homosexual/bisexual orientation, had some research or survey experience, and showed interest in participating in the study. The choice of interviewers with the same characteristics as the sample aimed to facilitate their access to the target group and the gay settings where the interviews were held. Questionnaires were applied over the course of two months in 1995, three months each in 1998 and 2002, and six weeks in 2005.

Subjects were asked about the following: age (< 25 and ≥ 25 years), schooling (illiterate/incomplete primary schooling, complete primary

schooling, and complete secondary or greater), sexual identity (gay, man/*bofe*, bisexual, and other), pattern of sexual relations in previous six months (no sexual relations, steady relationship with a man and with no sex with other men, steady relationship with a man and sex with other men, casual sex with different men). Risky sexual behavior or practice was defined as any insertive or receptive anal intercourse without condoms in the six months prior to the interview.

#### Data analysis

Prevalence rates for risky sexual behavior or practice were calculated in relation to the study variables and respective 95% confidence intervals (95%CI) for all the years studied. These measures were chosen because the software used in the RDS methodology calculates these parameters, adjusted for the size of the participants' social network and the way the participants were recruited. To evaluate time trends, data for each year were compared to those for the immediately following year.

Stata 9.0 (Stata Corp., College Station, USA) was used to process the data for 1995, 1998, and 2002, and RDSAT 5.5.0 (Volz E, Wejnert C, Degani I, Heckathorn DD. Cornell University, Ithaca,

USA) for 2005, in the latter case adjusting for the design effects. Calculation of the differences in proportions of sexual practices used the Pearson  $\chi^2$  and 95%CI.

#### Ethical issues

The research project was approved by the Institutional Review Board of the São José Hospital for Infectious Diseases in Fortaleza for the years prior to 2005 and the Institutional Review Board of the Federal University in Ceará for 2005. All subjects were informed of the study's objectives and signed a free and informed consent form.

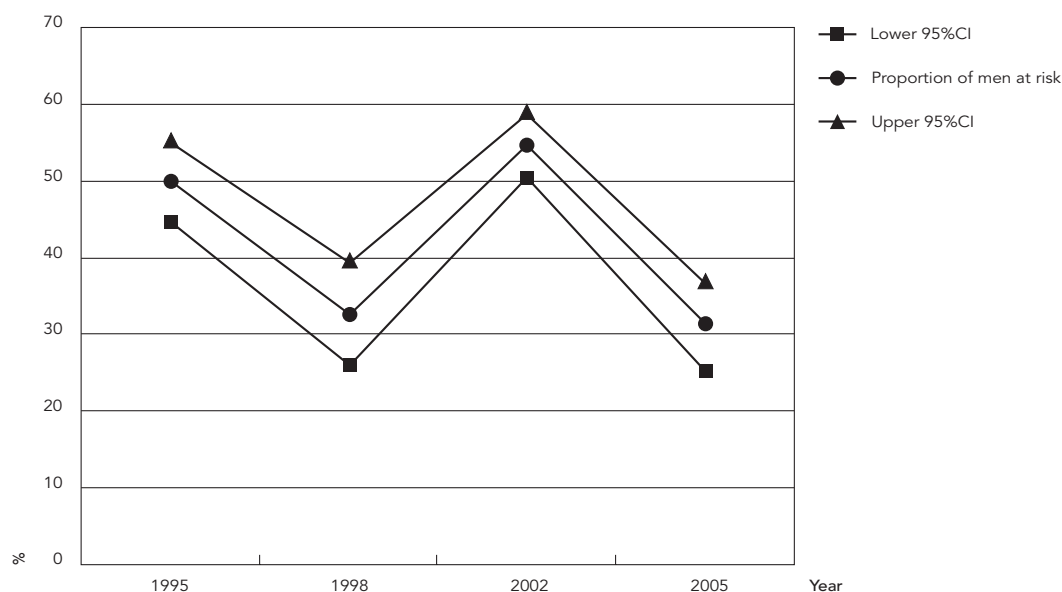
#### Results

The percentage of MSM involved in risky sex practices differed significantly between years. The proportion was high in 1995 (49.9%), decreasing significantly in 1998 (32.6%), increasing again in 2002 (54.6%), and reaching the lowest level in 2005 (31.4%) (Figure 1). This same pattern was observed in the two age brackets studied.

The percentage of MSM at risk varied significantly according to schooling. Individuals with more schooling were involved more frequently

Figure 1

Proportion of men who have sex with men (MSM) at risk. Fortaleza, Ceará State, Brazil, 1995 to 2005.



in unsafe sex practices in 2002 (44.3%) as compared to 1998 (28.7%). However, this proportion showed an important decline in 2005, to 21%. Meanwhile, subjects with low or medium schooling only showed a significant drop in risky behavior from 2002 (90.5% – low; 67.6% – medium) to 2005 (29.1% – low; 34.3% – medium) (Table 1 and Figure 2).

The proportion of MSM involved in risky sexual practices did not vary substantially according to sexual identity. Significant temporal variations were only observed in relation to gay sexual identity: there was a significant increase in gay men involved in risky sexual practices from 1998 (34.6%) to 2002 (52.5%), with a decline in the last year (35.8%) (Table 1).

Considering only participants that reported sexual relations in the previous six months, having a steady partner and no sex with other men, i.e., a so-called monogamous relationship, decreased from approximately 38% in 1995 and 1998 to some 30% in the subsequent years. Having a steady partner that and having sex with other men remained relatively constant throughout the period. Casual sex with different partners increased over the period, surpassing 50% in 2005.

Involvement in risky sexual relations showed important variations over time when comparing the different patterns of sexual relationships. Within so-called monogamous relationships, there was a decrease in unsafe sex from 2002 (56.4%) to 2005 (26.3%). For a steady relationship with a partner and sex with other men, the risk remained high throughout the period, with no significant variations. Among individuals that reported casual relations with different men, the risk pattern followed the same overall trend as in the target population as a whole (Table 1).

## Discussion and conclusions

Sexual behavior and practices by MSM in Fortaleza varied significantly over the period, as in similar studies in the United States, Australia, and Great Britain<sup>6,25,26</sup>. Several factors could be associated with this fluctuating behavior.

Heavy funding constraints for AIDS prevention in Brazil since several international agencies have curtailed their cooperation in the country and focused elsewhere (e.g., Africa and Eastern Europe) may help explain the fluctuating trends in risky sexual practices observed in the current

Figure 2

Proportion of men who have sex with men (MSM) at risk according to level of schooling. Fortaleza, Ceará State, Brazil, 1995 to 2005.

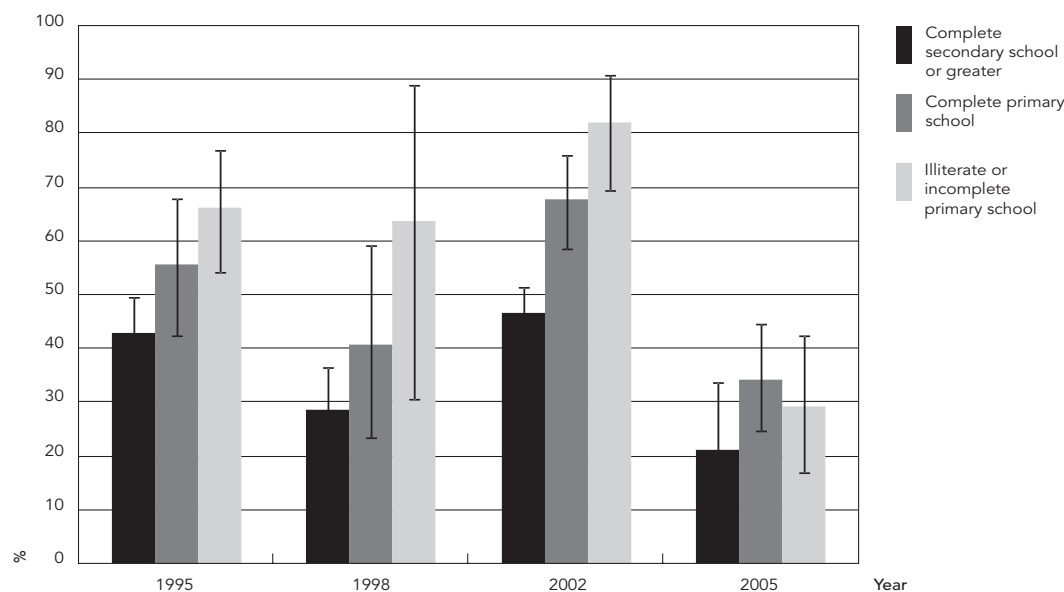


Table 1

Socioeconomic characteristics of men who have sex with men (MSM). Fortaleza, Ceará State, Brazil, 1995 to 2005.

| Variables                                       | 1995        |           | 1998        |           | 2002        |           | 2005          |           |
|---|-------------|-----------|-------------|-----------|-------------|-----------|---------------|-----------|
|   | Men at risk |           | Men at risk |           | Men at risk |           | Men at risk * |           |
|   | n (%)       | 95%CI     | n (%)       | 95%CI     | n (%)       | 95%CI     | n (%)         | 95%CI **  |
| Age (years)                                     |             |           |             |           |             |           |               |           |
| < 25  | 130 (53.1)  | 44.1-61.9 | 61 (32.8)   | 21.3-46.0 | 127 (59.8)  | 50.8-68.4 | 190 (35.2)    | 24.5-45.0 |
| ≥ 25  | 239 (48.1)  | 41.6-54.7 | 132 (32.6)  | 24.7-41.3 | 251 (46.6)  | 40.3-53.0 | 214 (27.4)    | 20.8-37.3 |
| Schooling                                       |             |           |             |           |             |           |               |           |
| Complete secondary school or greater            | 231 (42.9)  | 36.4-49.5 | 150 (28.7)  | 21.6-36.6 | 289 (44.3)  | 38.4-50.2 | 205 (21.0)    | 13.4-33.9 |
| Complete primary or incomplete secondary        | 63 (55.6)   | 42.5-68.1 | 32 (40.6)   | 23.7-59.4 | 71 (67.6)   | 55.5-78.2 | 91 (34.3)     | 24.7-44.8 |
| Illiterate/Incomplete primary                   | 74 (66.2)   | 54.2-76.8 | 11 (63.6)   | 30.8-89.1 | 21 (90.5)   | 69.6-98.9 | 92 (29.1)     | 17.0-42.4 |
| Identity  |             |           |             |           |             |           |               |           |
| Gay   | 268 (47.8)  | 41.6-53.9 | 162 (34.6)  | 27.3-42.4 | 297 (52.5)  | 46.7-58.3 | 258 (35.8)    | 25.1-43.6 |
| Man/Bofe  | 22 (59.1)   | 36.4-79.3 | 9 (22.2)    | 2.8-60.0  | 16 (43.8)   | 19.8-70.1 | 46 (23.6)     | 11.4-40.6 |
| Bisexual  | 57 (47.4)   | 34.0-61.0 | 20 (25.0)   | 8.7-49.1  | 55 (45.5)   | 32.0-59.4 | 94 (25.3)     | 13.8-36.8 |
| Other   | 21 (71.4)   | 47.8-88.7 | 2 (0.0)     | 0.0-84.2  | 8 (50.0)    | 15.7-84.3 | 4 (81.0)      | 0.0-99.9  |
| Pattern of sexual relationship (six months)     |             |           |             |           |             |           |               |           |
| Steady with one man, without sex with other men | 108 (59.3)  | 49.4-68.6 | 63 (36.5)   | 24.7-49.6 | 101 (56.4)  | 46.2-66.3 | 103 (26.3)    | 16.9-40.7 |
| Steady with one man, with sex with other men    | 49 (57.1)   | 42.2-71.2 | 32 (50.0)   | 31.9-68.1 | 78 (62.8)   | 51.1-73.5 | 46 (49.5)     | 34.3-65.8 |
| Casual relations with different men             | 132 (47.7)  | 39.0-56.6 | 71 (23.9)   | 14.6-35.5 | 178 (43.8)  | 36.4-51.4 | 179 (25.2)    | 6.6-42.9  |

\* Percentage adjusted by RDSAT 5.5.0 (Volz E, Wejnert C, Degani I, Heckathorn DD. Cornell University, Ithaca, USA);

\*\* Overlapping intervals were interpreted as not showing a statistically significant difference.

study<sup>27,28</sup>. Thus, Brazil had to prioritize more vulnerable population segments like women and children (to prevent vertical transmission). This decline in funding particularly impacted AIDS and STD prevention in the male homosexual and bisexual community, especially from 1998 to 2002. Specifically, the year 2002 showed the highest proportion of risky sexual practices in this community, which had shown decreases in unsafe sex practices until 1998.

Strides in AIDS treatment may also help explain the fluctuations in the percentage of MSM practicing unsafe sex during this period. The emergence of new and more effective drugs has made AIDS a "controllable" disease, improving quality of life, increasing survival<sup>29,30</sup>, while also leading to a feeling of greater safety in unprotected sexual practices<sup>31,32</sup>. Various studies contend that the observed increase in risky practices in some developed countries around 2002<sup>6,33,34,35</sup> resulted from the reappearance of individuals

willing to have unsafe sex as a function of the decline in morbidity and mortality due to highly active antiretroviral therapy (HAART)<sup>2,11,36,37</sup>. It is also possible that a new generation of adolescents with homosexual orientation feel the desire for a more intimate sexual experience at some time in their lives, without mechanical barriers<sup>38,39,40,41</sup>.

Level of schooling was also an important factor associated with involvement in unsafe sex. From 1995 to 2002, individuals with less schooling were exposed to greater risk, apparently not having been reached by the safe sex campaigns implemented mainly from 1995 to 1998. Meanwhile, higher schooling alone appeared as a protective factor throughout the entire period, probably due to greater access to information, independently of government and nongovernmental action<sup>42,43</sup>. Yet even more educated individuals showed a high rate of risky practices, especially after a period with-

out major prevention work in this community (1998 to 2002).

Various studies suggest that pattern of sexual relationship may be associated with risky sexual behavior. For example, some authors emphasize that condom use in steady relations tends to be lower<sup>44,45</sup>, a phenomenon corroborated in a survey on sexual behavior in the Brazilian population<sup>46,47,48</sup>. This is associated with the belief that condoms are a valid preventive measure<sup>49</sup>, but that they are unnecessary when one “knows the partner intimately”<sup>50,51</sup>. The international literature also suggests that when an individual begins a steady relationship, the other previous “steady partners” are not taken into account. Equally common among MSM and other groups (e.g., adolescents) is the occurrence of “serial monogamy”<sup>49,52,53</sup>, whereby steady relations with a single partner for a relatively short period are followed by other relationships with the same characteristics. This leads to the unsubstantiated belief that unprotected sex is safe against STD/AIDS in such situations.

However, it does not appear that the changes in the pattern of sexual relations among Brazilian MSM over the course of the period studied here can explain the observed fluctuations. There was in fact a decline in steady sexual relations without sex with other partners from 1998 to 2002, a substantial increase in casual relations in the last wave, and relative stability in the percentage of MSM reporting steady relations combined with sex with other men, but the fluctuations in risky behaviors do not follow any consistent trend with variations in the patterns of sexual relationships.

This was a pioneering study in monitoring sexual behavior and involvement in unsafe sex practices for STD/AIDS among MSM in the State of Ceará and Brazil as a whole. Epidemiological studies on such issues are essential for adequate surveillance of the AIDS epidemic, since surveillance of HIV alone is known to be insufficient to provide information for planning preventive measures<sup>5</sup>. This type of follow-up is known as second-generation HIV surveillance<sup>8,54</sup>. This monitoring strategy is capable of gathering important information on the diversity of behaviors and sexual practices among MSM and other potentially hidden or hard-to-reach populations<sup>18,55</sup>.

The surveys presented here summarize some of the main problems in studies targeting hard-to-reach populations, and there is generally no single solution, since comparisons with results obtained using an ideal selection process (e.g., censuses of these populations) are not feasible. There is extensive international literature using these different types of sampling, and the vast

majority use analytical procedures as if these processes were derived from random samples. In the years preceding 2005, the same approach was taken to the samples, regardless of the sampling technique used. The majority of the studies using TSS were non-weighted, and there is still considerable debate over the most appropriate methods for weighting and adjusting the samples obtained via TSS and RDS.

Sequential studies of MSM are still quite scarce in Brazil and even in the international setting. Most of the existing studies used other sampling techniques cited in this study until 2005, when the RDS methodology began to be used in the country and was recommended by the Ministry of Health as the method of choice for hard-to-reach populations in general. In 2002, when TSS was used, there was little experience in Brazil on the weighting used to analyze data collected with this technique. Although participants in the 2002 study were selected randomly, it was not possible to weight them, since the data were lost on the total number of individuals from which the sample was extracted. Thus, while recognizing the limitation of the processes used in this study, there is no other study like it in Brazil.

The results of the current study should be interpreted in light of the familiar limitations of non-probabilistic selection procedures and particularly the use of different methodologies from one study year to the next. One must consider the possibility that these characteristics accounted at least partially for the time trends indicated here. However, a study comparing populations recruited with the different methodologies showed that the participants are distributed in different proportions in the social classes, leading to overrepresentation of higher-income individuals with the TSS and snowball techniques and their underrepresentation in RDS<sup>56</sup>. Thus, the decrease in risky behavior observed in 2005 would gain even more validity, given the greater participation by lower-income social classes, which usually show higher rates of risky behavior.

Brazil demonstrates a high degree of geographic, social, economic and cultural heterogeneity, and local policies need to take this into account. This is true both at the government level and in the development of civil society organizations involved in the response to AIDS<sup>57</sup>. Thus, when studying risky sexual behaviors, some important issues should be considered, especially the fact that subjective characteristics are involved in the problem. In this sense, there is an evident need to understand the sexual values in Brazilian culture in general, and more specifically in the homosexual subcultures, considering the subjective aspects related to erotic pleasure and



sexual satisfaction, which are associated with risky behaviors and the difficulties in changing them, regardless of the population's knowledge of risky practices<sup>36</sup>.

Thus, prevention and intervention activities are needed that extend beyond supplying infor-

mation. These interventions need to understand and address the more complex social and psychological issues associated with risky sexual practices, since the adoption of safer practices is not necessarily related to the level of knowledge about them.

## Resumo

*Estudaram-se as tendências recentes das práticas sexuais de risco para DST/AIDS entre homens que fazem sexo com homens (HSH) em Fortaleza, Ceará, Brasil. Realizaram-se quatro estudos seccionais (1995, 1998, 2002 e 2005) em HSH, com 14 anos ou mais, que tenham referido prática sexual oral ou anal com homens nos últimos 12 meses. Definiu-se prática sexual de risco uma relação anal insertiva ou receptiva sem uso de preservativo nos seis meses que antecederam a entrevista. Utilizaram-se técnicas de recrutamento do tipo snow ball (1995, 1998, 2002 – 32%); time space sampling (2002 – 68%) e respondent driven sampling (2005). Análises basearam-se nas comparações entre proporções. Elevados percentuais de práticas sexuais de risco foram referidos em 1995 (49,9%), decrescendo em 1998 (32,6%), crescendo em 2002 (51,3%) e apresentando os menores percentuais em 2005 (31,4%). Indivíduos com escolaridade mais elevada aumentaram as práticas de risco entre 1998 e 2002, decrescendo no último período. Nos de estrato de escolaridade baixa ou média observou-se declínio no comportamento de risco entre 2002 e 2005. Os resultados deste estudo salientam a importância da vigilância comportamental para adequação dos programas de prevenção das DST/AIDS nessa população.*

*Comportamento Sexual; Sexo sem Proteção; Homossexualidade Masculina*

## Contributors

R. C. Gondim participated in the elaboration of the projects in the different years, the fieldwork from 1995 to 2002, data analysis, and writing of the article. L. R. F. S. Kerr contributed to the elaboration of the projects in the different years, the data analysis, and writing of the article. G. L. Werneck contributed to the data analysis and writing and revision of the article. R. H. M. Macena and M. K. Pontes collaborated in the fieldwork in 2005, the data analysis, and writing of the article. C. Kendall participated in the data analysis and writing of the article.

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